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ANTECEDENTS, MODERATORS, AND CONSEQUENCES OF CO CREATION: A RESEARCH IN THE FIELD OF OPEN-SOURCE SOFTWARE DEVELOPMENT

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TESE DE DOUTORAMENTO

ANTECEDENTS, MODERATORS, AND CONSEQUENCES OF CO-CREATION: A RESEARCH IN THE FIELD OF OPEN-SOURCE SOFTWARE DEVELOPMENT

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ESCOLA DE DOUTORAMENTO INTERNACIONAL DA UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

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In memory of my beloved mother Sara, brother Zeferino, Joana Carvalho and our two children, may they rest in peace in the kingdom of glory.

Thank you to my father António and sister Maria de Céu, my faithful companions on my many journeys to Santiago de Compostela and my unwavering supporters.

To my remaining family and friends, I am deeply grateful for your love and support.

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RESUMEN

La Lógica de Servicio Dominante (SDL) en marketing desafía las definiciones convencionales de bienes y servicios al redefinir el servicio como la aplicación de competencias y recursos especializados en beneficio de otros. Hace hincapié en que todas las empresas actúan esencialmente como proveedores de servicios que utilizan bienes como medios para ofrecer servicios. La SDL cambia la perspectiva hacia la vista de los clientes como participantes activos en el proceso de creación de valor, en lugar de meros receptores de bienes y servicios.

El concepto de co-creación toma un lugar central en el ámbito de la SDL, subrayando la importancia de involucrar a los clientes en la co-diseño y entrega de servicios personalizados. Este estudio se adentra en la co-creación, con un enfoque específico en dos variables fundamentales: la participación en la co-creación y la experiencia de la co-creación.

El primer segmento investiga los antecedentes y moderadores de la co-creación, incluyendo factores influyentes como el sentido de comunidad, la identificación con la plataforma y el carácter innovador, que impulsan la participación activa. La segunda parte examina los resultados de la co-creación, arrojando luz sobre los beneficios económicos y relacionales, junto con efectos indirectos como la satisfacción y su impacto en la participación futura y la defensa.

La recopilación de datos del estudio involucró la realización de una encuesta en línea distribuida a través de plataformas de comunidades de código abierto dedicadas al desarrollo del sistema operativo Linux, lo que resultó en una destacada tasa de respuesta del 41,10%.

La investigación resalta las ventajas de la co-creación, abarcando beneficios tanto directos como indirectos. Directamente, crea valor económico y relacional al fomentar el sentido de conexión y propiedad de los participantes, lo que a su vez genera valor emocional y económico, nutre la confianza y cultiva la lealtad. Además, subraya el papel fundamental de la satisfacción en la formación de percepciones sobre la calidad del producto e influencia en la participación futura.

Además de estos beneficios, el estudio profundiza en la exploración de tres factores clave en la co-creación: la identificación con la plataforma, el sentido de comunidad y el carácter innovador. Estos elementos se identifican como precursores para el éxito de la co-creación, desempeñando un papel doble con efectos directos y moderadores en el proceso de co-creación.

En conjunto, la investigación enfatiza el sólido vínculo entre la experiencia de co-creación y la participación, subrayando cómo los lazos emocionales y el sentido de logro sirven como factores motivadores para una participación sostenida. Esta conexión empodera a los participantes, permitiéndoles dar forma activamente al desarrollo de productos y servicios, lo que potencialmente conduce a la formación de relaciones significativas y conexiones duraderas con las empresas.

Palabras Clave: Identificación de la Plataforma, Sentido de Comunidad, Carácter Innovador, Experiencia de Co-Creación, Participación en la Co-Creación, Valor Relacional, Valor Económico, Satisfacción, Palabra de Boca, Participación Futura, Lógica Dominante del Servicio, Código Abierto, Linux

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ABSTRACT

Service-Dominant Logic (SDL) in marketing challenges conventional definitions of goods and services by redefining service as the application of specialized competencies and resources for the benefit of others. It emphasizes that all firms essentially act as service providers using goods as a means to deliver services. SDL shifts the perspective towards viewing customers as active participants in the value creation process, rather than mere recipients of goods and services.

The concept of co-creation takes center stage within the realm of SDL, underlining the significance of involving customers in the co-design and delivery of personalized services. This study delves into co-creation, with a specific focus on two pivotal variables: co-creation participation and co-creation experience.

The first segment investigates the antecedents and moderators of co-creation, including influential factors such as the sense of community, platform identification, and innovativeness, which drive active participation. The second part scrutinizes the outcomes of co-creation, shedding light on the economic and relational benefits, alongside indirect effects like satisfaction and its impact on future engagement and advocacy.

The study's data collection involved conducting an online survey distributed through open-source community platforms dedicated to the development of the Linux operating system, resulting in a commendable response rate of 41.10%.

The research accentuates the advantages of co-creation, encompassing both direct and indirect benefits. Directly, it creates economic and relational value by fostering participants' sense of connection and ownership, which in turn generates emotional and economic value, nurtures trust, and cultivates loyalty. Additionally, it underscores the pivotal role of satisfaction in shaping perceptions of product quality and influencing future participation.

In addition to these benefits, the study delves into the exploration of three key factors in co-creation: platform identification, sense of community, and innovativeness. These elements are identified as precursors to successful co-creation, playing a dual role with both direct and moderating effects on the co-creation process.

Collectively, the research emphasizes the potent link between co-creation experience and participation, underscoring how emotional bonds and a sense of accomplishment serve as motivating factors for sustained involvement. This connection empowers participants, enabling them to actively shape the development of products and services, potentially leading to the formation of meaningful relationships and enduring connections with firms.

Keywords: Platform Identification, Sense of Community, Innovativeness, Co-Creation Experience, Co-Creation Participation, Relational Value, Economic Value, Satisfaction, Word-of-Mouth, Future Participation, Service-Dominant Logic, Open-Source, Linux

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RESUMO EXTENDIDO

1. Introdución

O artigo de Vargo and Lusch (2004a) introduciu unha perspectiva revolucionaria chamada Lóxica de Dominio de Servizo (SDL, por súas siglas en inglés) para o marketing. Desafiou as definicións tradicionais de bens e servizos, afirmando que todas as empresas son fundamentalmente provedoras de servizos, utilizando bens como un medio para ofrecer servizos aos clientes. O SDL redefiniu o servizo como a aplicación de competencias e recursos especializados en beneficio de outros, superando os límites das industrias de servizos tradicionais para abranguer todas as actividades económicas. Cambiou o enfoque cara á percepción dos clientes como participantes activos na creación de valor en lugar de receptores pasivos de bens e servizos.

A co-creación é un concepto central no marco do SDL, destacando a importancia de implicar aos clientes no deseño e na entrega de servizos personalizados. Ao implicar os clientes no proceso de co-creación e mellorar continuamente a experiencia do cliente, as empresas poden crear interaccións máis satisfactorias e personalizadas. O SDL tamén fomenta a colaboración entre as partes interesadas, como provedores e colaboradores, para co-crear valor que beneficie a todas as partes involucradas. Non obstante, o SDL é un concepto en evolución que segue a ser refinado e explorado, o que fai replantexar os conceptos de marketing e a validación de estratexias existentes, así como a descuberta de novos enfoques e ideas que poden xurdir no futuro.

Este estudo enfócase na co-creación, dividíndoa en dúas variables clave: a participación na co-creación e a experiencia de co-creación.

A primeira parte do estudo explora os antecedentes e moderadores da co-creación, enfatizando o seu papel na comprensión das motivacións dos voluntarios que dedican o seu tempo e experiencia ás actividades de co-creación. Estes factores motivacionais, como o sentido de comunidade, a identificación coa plataforma e a carácter innovador, impulsan a participación activa e colaborativa, fomentando o altruísmo, o desenvolvemento de relacións e a posta en común do potencial intelectual entre os participantes. A segunda parte examina os resultados da co-creación, destacando os beneficios económicos e relacionais que xorden da participación activa. Tamén se consideran efectos indirectos, como a satisfacción, que poden influír na implicación emocional dos participantes e na súa motivación para participar en futuras experiencias de co-creación e defender os produtos ou servizos que axudan a crear.

2. Modelo de investigación

Ao realizar os estudos que sustentan esta tese, a identificación coa plataforma, o sentido de comunidade e o carácter innovador foron considerados como antecedentes da co-creación, influintes na implicación activa das persoas que poñen o seu tempo, coñecementos e habilidades técnicas á disposición da comunidade de software de código aberto á que desexan unirse. Tamén se considerou que estes mesmos antecedentes tamén moderan a influencia que cada un ten sobre a co-creación.

Desenvolveuse un modelo de estudo para os antecedentes e moderadores da co-creación. O modelo amósase na Figura 1.

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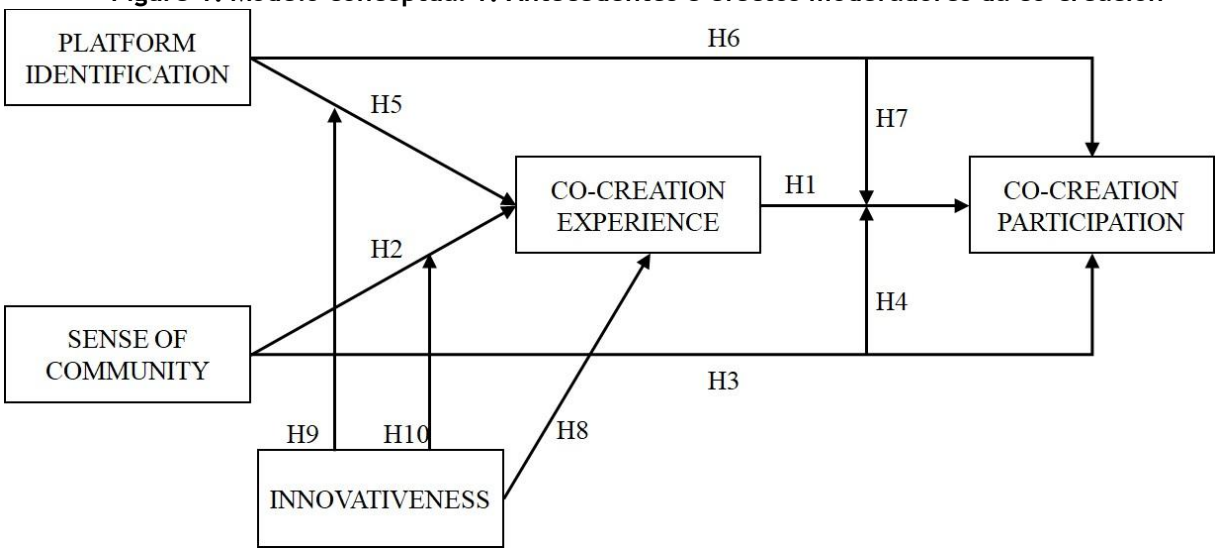
Figure 1. Modelo conceptual 1: Antecedentes e efectos moderadores da co-creación



As hipóteses de investigación foron formuladas para investigar o impacto directo positivo de cada antecedente na co-creación. Ademais, estas hipóteses exploran os seus roles moderadores, tanto en termos de participación na co-creación como na experiencia da co-creación.

H1: A experiencia de co-creación está asociado positivamente na participación de co-creación.

H2: O sentido de comunidade está asociado positivamente na experiencia de co-creación.

H3: O sentido de comunidade está asociado positivamente na participación da co-creación.

H4: O sentido de comunidade modera a relación entre a experiencia de co-creación e a participación na co-creación.

H5: A identificación coa plataforma está asociado positivamente na experiencia de co-creación;

H6: A identificación coa plataforma está asociado positivamente na participación de co-creación;

H7: A identificación coa plataforma modera a relación entre a experiencia de co-creación e a participación de co-creación;

H8: A carácter innovador está asociado positivamente na experiencia de co-creación;

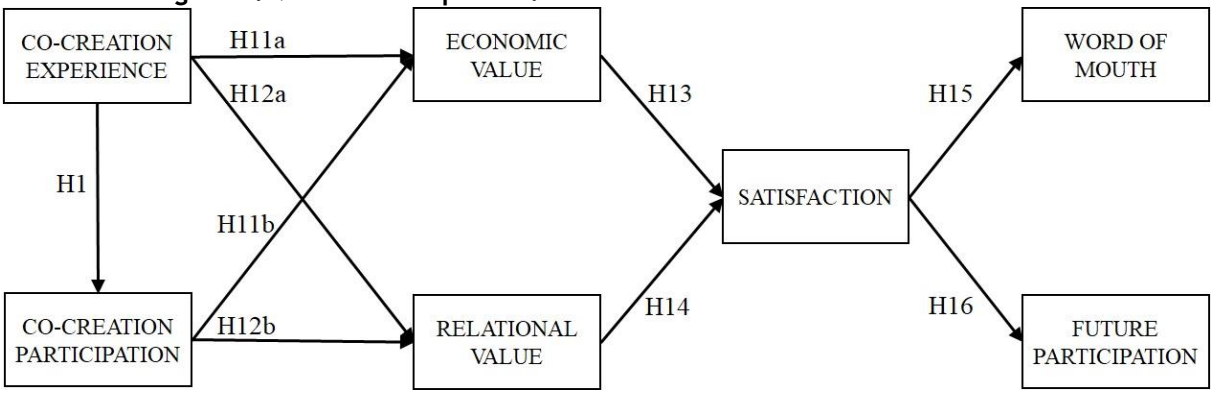
H9: A carácter innovador modera a relación entre a identificación coa plataforma e a experiencia de co-creación;

H10: A carácter innovador modera a relación entre o sentido de comunidade e a experiencia de co-creación;

Para estudar as consecuencias da co-creación, considerouse que o valor económico e o valor relacional son efectos directos da co-creación. Tamén se considerou que a satisfacción, o boca-a-boca e a participación futura serían efectos indirectos da co-creación.

Coa base na suposición anterior, desenvolveuse un modelo de estudo para os resultados da co-creación. O modelo amósase na Figura 2.

Figure 2. Modelo conceptual 2: Analizar as consecuencias da co-creación



Desenvolvéronse hipóteses de investigación que se centran nos efectos directos da co-creación como resultado:

H11a: A experiencia de co-creación está asociado positivamente no valor económico.

H11b: A participación na co-creación está asociado positivamente no valor económico.

H12a: A experiencia de co-creación está asociado positivamente no valor relacional.

H12b: A participación na co-creación está asociado positivamente no valor relacional.

Tamén se desenvolveron hipóteses sobre os beneficios indirectos que os participantes poderían obter como resultado:

H13: O valor económico está asociado positivamente na satisfacción.

H14: O valor relacional está asociado positivamente na satisfacción.

H15: A satisfacción está asociado positivamente na boca-a-boca.

H16: A satisfacción está asociado positivamente na participación futura.

3. Metodoloxía

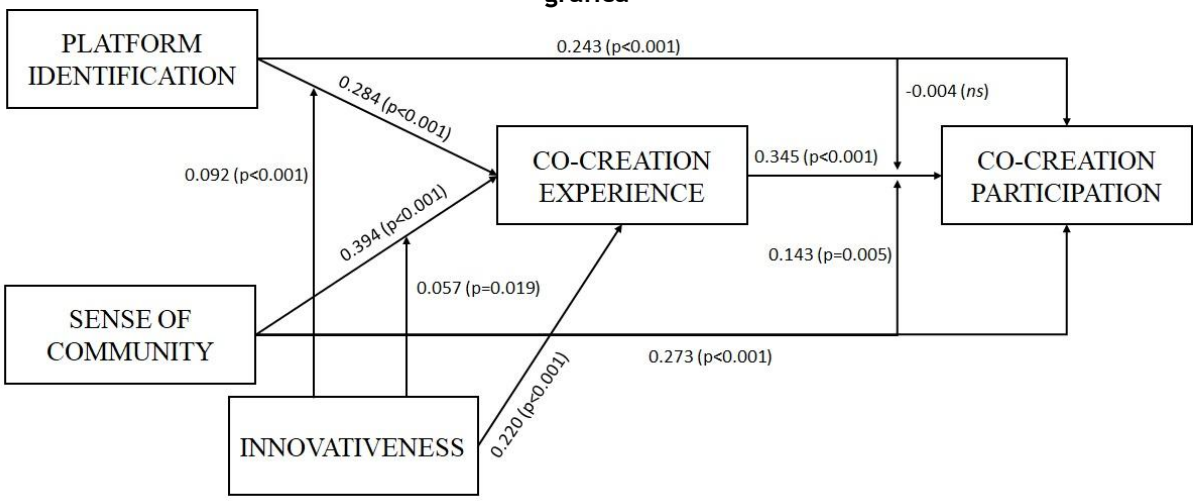
A recollida de datos para o estudo realizouse a través dunha enquisa en liña, enviada a través das plataformas da comunidade de código aberto para o desenvolvemento do sistema operativo Linux. Escolléronse seis comunidades, tres para distribución gratuíta e tres para distribución de pago. Foron elixidas as distribucións gratuítas para Fedora, Debian e Ubuntu. As distribucións de pago escolléronse para Red Hat, IPBrick e Suse. A recollida de datos para

a distribución IPBrick levouse a cabo nunha comunidade xeral de Linux, onde os participantes foron identificados como usuarios dese sistema. Isto debeuse a que a comunidade dedicada á distribución IPBrick foi descontinuada.

Na recollida de datos, de entre os 20358 posibles candidatos a responder, só foi posible enviar 1662 invitacións para participar na enquisa debido a limitacións impostas polas plataformas, das cales 683 usuarios responderon, resultando nunha taxa de resposta do 41.1%.

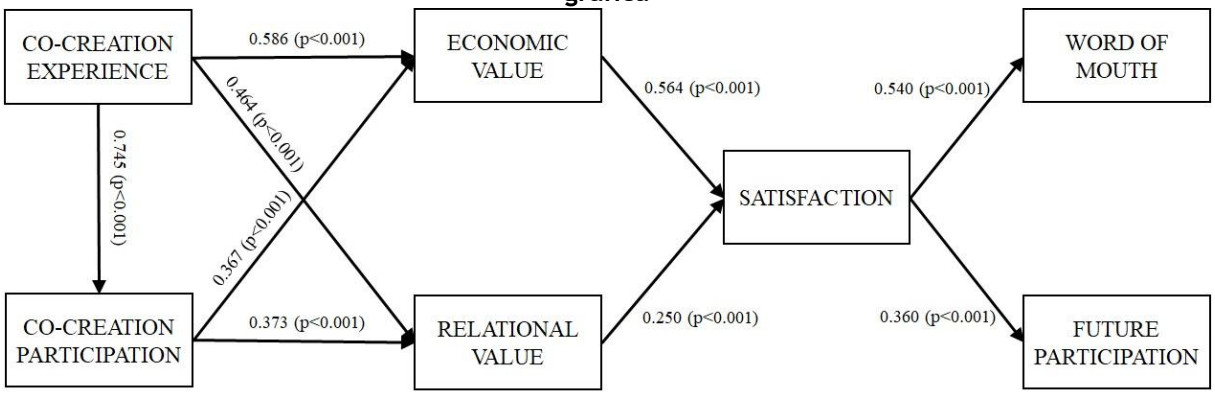
Os modelos conceptuais foron probados cos datos obtidos da enquisa en liña. Polo tanto, realizouse unha Análise Factorial Confirmatoria (CFA, por súas siglas en inglés) e unha análise con Modelos de Ecuacións Estruturais (SEM, por súas siglas en inglés). Unha vez completada a análise, as seguintes figuras amosan as relacións conceptuais e parámetros estimados para cada un dos modelos estimados.

Figure 3. Resumo do axuste do modelo e estimación dos parámetros (modelo 1): descrición gráfica



χ2ms (2) = 4.897 (p > 0.05); χ2bs (19) = 844.915 (p < 0.001)
CFI 0.996; RMSEA = 0.046; SRMR = 0.004; Log likelihood: -10,113.972
Note: Standardized parameter estimate (significance level); ns=not significant

Figure 4. Resumo do axuste do modelo e estimación dos parámetros (modelo 2): descrición gráfica



Chi-square=1,141.566, df=653; CMIN/df=1.748
CFI=0.974; IFI=0.974; TLI=0.972; NFI=0.941; RMSEA=0.033
Note: Standardized parameter estimate (significance level); ns=not significant

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4. Conclusións

4.1 Discusión

Ao longo dos anos, a SDL e a co-creación recibiron moita atención na literatura, tanto en termos teóricos como prácticos. Estes estudos beneficiaron o coñecemento e a acción práctica na vida cotiá das empresas de todo o mundo. Tamén axudaron a crear novos modelos de negocio e a cambiar o panorama da relación das empresas cos seus consumidores.

Unha das cuestións que ten preocupado aos investigadores e que esta tese procura axudar a esclarecer é o que motiva os consumidores e os usuarios de plataformas a participar en entornos de co-creación apoiados nos fundamentos da SDL. Especialmente en entornos de código aberto, nos que os empregados son voluntarios que ofrecen o seu tempo libre para axudar a unha comunidade e as empresas que interactúan con eles.

Tamén busca axudar a comprender que beneficios se poden obter, xa sexa directamente a través da participación do consumidor ou do usuario, ou a través de beneficios indirectos. As empresas tamén participan en comunidades de desenvolvemento de código aberto porque as ven como fonte de innovación, deseño e desenvolvemento de negocios. Polo tanto, hai un intercambio continuo de información entre a empresa e a comunidade.

En xeral, o estudo destaca que os entornos de co-creación xeran enormes beneficios para as empresas e os seus consumidores.

4.1.1 Experiencia de Co-Creación e Participación na Co-Creación

Os resultados revelan unha notable ligazón entre a experiencia de co-creación e a participación na co-creación. Esta conexión destaca unha dinámica fundamental na que a experiencia de co-creación xoga un papel multifacetado á hora de impulsar unha implicación activa. A co-creación ofrece aos participantes unha plataforma para conectarse emocionalmente cos produtos ou servizos aos que contribúen, creando unha sensación de investimento persoal. Este vínculo emocional non só alimenta a dedicación, senón que tamén forma un sentido de propiedade, facendo que os participantes sintan que están a dar forma a un proxecto como unha extensión da súa identidade.

Ademais, a co-creación ofrece unha sensación de logro e importancia, recoñecendo o verdadeiro impacto das súas contribucións, o que á súa vez aumenta a súa motivación para unha participación continuada. Esta conexión emocional, influenciada pola experiencia de co-creación, esténdese á participación na co-creación e fomenta un sentido duradeiro de propiedade e pertenza, contribuíndo á implicación sostida. Ademais, esta conexión pode empoderar aos participantes, permitíndolles dar forma activamente á creación de produtos ou servizos, intensificando o vínculo emocional e levando potencialmente a relacións interpersoais significativas, reforzando a conexión duradeira entre os participantes e as empresas.

4.1.2 Antecedentes e Moderadores da Co-Creación

Foron identificados tres factores cruciais no contexto da co-creación: identificación coa plataforma, sentido de comunidade e caracter innovador. Estes elementos considéranse como precedentes do éxito da co-creación e teñen efectos directos e de moderación no proceso de co-creación.

O sentido de comunidade destacase como un factor fundamental na co-creación. Cando as persoas se senten parte dunha comunidade, fomenta unha experiencia positiva de co-creación. Este sentido de unidade promove a colaboración, a confianza mutua e a comunicación eficaz entre os participantes. A confianza é especialmente esencial para o éxito

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da co-creación, e os canais de comunicación ben establecidos dentro das comunidades melloran aínda máis a experiencia de co-creación, fomentando a participación activa.

A identificación coa plataforma tamén se enfatiza como outro aspecto fundamental da co-creación. Cando os clientes establecen unha forte conexión emocional coa plataforma de co-creación, inflúe positivamente na experiencia de co-creación e na participación activa. A implicación emocional motiva aos participantes a contribuír con ideas e información de maneira activa, reforzando a confianza na empresa que facilita a co-creación e mellorando a calidade dos resultados da co-creación.

O carácter innovador recoñécese como un factor vital na co-creación. O pensamento innovador mellora a colaboración, enriquece as experiencias de co-creación e aumenta a adaptabilidade dos participantes aos cambios no mercado. Aquelas persoas con propensión á innovación están máis abertas a explorar novas ideas e solucións durante a co-creación, o que leva a resultados máis creativos. O carácter innovador tamén actúa como moderador nas relacións entre a identificación coa plataforma, o sentido de comunidade e a experiencia de co-creación, personalizando o impacto destes factores segundo o nivel do carácter innovador de cada participante.

4.1.3 Consecuencias da Co-Creación: Valor Económico e Valor Relacional, Satisfacción, Boca-a-Boca e Participación Futura

O fragmento proporcionado discute o profundo impacto da co-creación nos seus resultados, centrando-se particularmente na influencia da participación activa nas actividades de co-creación. A análise abarca efectos directos e indirectos, examinando como a co-creación inflúe no valor relacional, valor económico, satisfacción, participación futura e boca-a-boca.

Destaca como a experiencia de co-creación contribúe ao valor económico máis alá das interaccións puramente transaccionais. Os participantes que dan forma activamente ás súas experiencias de co-creación desenvolven un forte sentido de conexión e propiedade, creando tanto valor emocional como económico. Esta fonte dual de valor abrangue diversos beneficios económicos, desde aforros de custos ata satisfacción persoal, subliñando a natureza multifacética da percepción do valor.

O fragmento profundiza no papel da experiencia de co-creación na promoción do valor relacional. A través da colaboración e da comprensión compartida, os participantes constrúen confianza e relacións duradeiras que van máis alá dos beneficios transaccionais, levando a unha alta satisfacción e fidelidade inquebrantable. A implicación activa na co-creación fomenta a confianza, a colaboración e relacións duradeiras, reforzando a relación positiva entre a participación e o valor relacional.

A satisfacción destácase como un factor crucial, xa que os participantes obtén satisfacción cando perciben beneficios substanciais en relación co seu investimento. Esta percepción de valor económico non só xera satisfacción, senón que tamén influencia as percepcións da calidade do produto ou servizo, estimulando unha maior participación e fidelidade a longo prazo. As relacións sólidas baseadas na confianza, o compromiso e o entendemento mutuo contribúen a niveis máis altos de satisfacción e fidelidade duradeira.

O fragmento tamén enfatiza o papel da satisfacción na xeración dunha comunicación positiva de boca-a-boca entre os participantes. Os participantes satisfeitos convertéronse en defensores dos produtos, servizos ou comunidades cos que participan, o que conduce a unha maior recoñecemento da marca e participación no mercado. Ademais, os participantes satisfeitos son máis propensos a participar en futuras iniciativas de co-creación, fomentando o

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empoderamento e a propiedade, motivándoos a continuar a participar e atraendo novos colaboradores a través dunha comunicación positiva de boca-a-boca.

4.2 Contribucións

Este estudo contribúe a aumentar do coñecemento sobre a co-creación e a SDL, coa OSS como base de investigación. Ao examinar a co-creación baseada nos principios da SDL, especialmente nos entornos de OSS, é posible ver un medio de innovación co apoio de varias entidades externas para engadir valor, coa finalidade de obter beneficios a cambio da súa contribución. Estas entidades externas poden ser clientes, provedores e outros socios. Ademais, este estudo tamén contribúe mostrando que os participantes en entornos de co-creación en liña tamén perciben beneficios, tanto directos como indirectos.

Os participantes perciben beneficios directos como valor económico e valor relacional, mentres que os beneficios indirectos, como a satisfacción de participar, fan que estean dispostos a participar en futuras oportunidades para contribuír á empresa e, a través do boca a boca, proporcionar un testemuño positivo da súa experiencia. Esta investigación destaca o papel significativo da co-creación na mellora dos servizos, no fomento da innovación e na consecución do éxito empresarial. Enfatiza a importancia da co-creación, que estimula a participación activa, nutrindo as conexións emocionais, o sentido de logro e o empoderamento entre os participantes.

Ademais, subliña a importancia dun sentido de comunidade na promoción da colaboración, da confianza e da comunicación efectiva nos entornos de co-creación. Alén diso, destácase o papel da plataforma de co-creación como axente activo que inflúe significativamente na calidade das experiencias de co-creación e na satisfacción dos participantes. En xeral, enfatiza o impacto da co-creación na satisfacción, no boca a boca, no valor económico e relacional, e na perspectiva máis ampla da co-creación que implica múltiples actores.

4.3 Limitacións

Unha limitación importante é a comprensión das motivacións dos participantes na co-creación, especialmente no que respecta á importancia da co-creación como axente de cambio que vai máis alá das expectativas convencionais. Aínda que as motivacións que inflúen na participación e implicación activa dos participantes en entornos de co-creación foron abordadas de maneira parcial, son necesarios máis estudos para unha comprensión máis completa destas motivacións.

A relación entre diferentes tipos de comunidades e sectores pode variar significativamente en función do contexto no que se introduce a co-creación e a SDL. A xeneralización destes conceptos pode non ser aplicable a todas as situacións.

O estudo enfócase principalmente nos aspectos positivos dos conceptos considerados como antecedentes da co-creación. Sen embargo, pode haber limitacións e desafíos asociados que non foron explorados.

4.4 Futuras liñas de investigación

A investigación futura debería indagar sobre como a calidade dos produtos ou servizos co-creados se compara cos desenvolvidos tradicionalmente, incluíndo un análise de atributos como o rendemento, a durabilidade e a fiabilidade.

Investigar como as diferenzas culturais, como os valores, creencias e normas, afectan a implementación de estratexias de co-creación en contextos internacionais e como estas diferenzas influen na comunicación, colaboración e resultados da co-creación.

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Explorar posibles desafíos asociados á co-creación, como conflitos entre participantes, resistencia ao cambio e problemas de seguridade dos datos, e desenvolver estratexias para abordar eficazmente estes desafíos.

A investigación futura debería centrarse en establecer métricas eficaces para rastrexar o progreso da co-creación de valor, especialmente en contextos internacionais e culturais diversos, para comprender os desafíos que presenta a internacionalización das empresas.

Investigar como a co-creación influencia as estratexias de marketing e como as empresas poden axustar as súas estratexias tradicionais para alinhalas cos principios da co-creación.

Estudar como a adopción da co-creación afecta á cultura interna das organizacións e como crear unha cultura que promova a co-creación de valor.

Investigar estratexias eficaces para involucrar a clientes na co-creación de valor e como as empresas poden establecer colaboracións e asociacións eficaces con outros actores na cadea de valor, mantendo prácticas éticas nas súas interaccións.

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INDEX OF ABBREVIATIONS

ABREVIATION	FULL TERM
A2A	Actor-Actor
ACF	Análisis Factorial Confirmatorio
AVE	Average Variance Extracted
B2B	Business-Business
B2C	Business-Consumer
C2C	Consumer-Consumer
CA	Cronbach Alpha
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CMIN	Square Index
COSS	Commercial Open-Source Software
CR	Composite Reliability
DF	Degree of Freedom
FP	Foundation Premises
GDL	Good-Dominant Logic
IFI	Incremental Fit Index
IS	Information System
IT	Information Technology
ITC	Information Technology and Communication
LOS	Linux Operating System
MEE	Modelo de Ecuación Estructural
MVP	Minimum Viable Product
NFI	Normed Fit Index
Ns	Not Significant
OSS	Open-Source Software
RMSEA	Root Mean Square Error of Approximation
SDL	Service-Dominant Logic
SEM	Structural Equation Modeling
TLI	Tucker-Lewis Index
UK	United Kingdom
USA	United State of America

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INTRODUCTION

In this section an introduction is made to the study that supports this thesis. It frames the study in marketing terms and in the context of information technologies, mainly supported by open-source operating systems. This is the medium used to develop this study and conduct the research.

When the article by Vargo and Lusch (2004a) dubbed "Evolving to a New Dominant Logic for Marketing" was presented, they presented a new perspective on the concepts goods and services, which came to modernize their definitions that were already rooted and accepted long time ago. The presentation of this new perspective has provoked a huge discussion that has continued over time and created new concepts and new approaches, both in the discipline of marketing and in the relationship of customers with firms. In their view, services are more prevalent than goods. Therefore, in this perspective, goods are seen as a means for firms to provide services. They present the Service Dominant-Logic (SDL) in marketing. So, all firms are service providers, so firms that produce goods, do so only as a means of providing service to their customers (Grönroos & Gummerus, 2014; Vargo & Lusch, 2006). But also, with the approach they have proposed, the customer gains a central and active role (Maull et al., 2012). Where, the customer is involved to co-create his worthwhile experience (Tossavainen, 2017).

In a broader understanding, the SDL reverses the prominence of the roles that goods and services had until then and as they were accepted. However, in the SDL there is a clear understanding that both remain important for marketing. But SDL goes further by redefining the relationship between the firm and the customer. The SDL considers that both are in constant communication, so they can improve the offer. Therefore, in this understanding, firms are constantly learning from customers, so they do not create value for themselves, but to offer to customers. This knowledge is acquired through customer feedback through the various interactions that are created over time. What is in line with idea of Haeckel (1999), firms are in line with the thought of "feeling and responding" to what the customer wants in order to have a continuous and as healthy relationship as possible.

The evolution proposed by Vargo and Lusch (2004a) supposedly influenced the recognition of the importance of services, but they also received influence of the perspectives of Zimmermann (1951) and Penrose (1959) who considered that human knowledge and skills are extremely important resources. The studies of Gummesson (1995) who came to the conclusion that business activities provide services to customers. However, it should be noted that in the 1990s there was a technological boom and that made the planet a small global village, at the expense of the rapid development of the internet (Dede, 1990; Ger, 1999; Goldenberg & Levy, 2009). The latter allowed firms and customers to relate directly which eliminated barriers that previously existed and did not allow communication. What led to a greater interaction between firms and customers, which has been increasingly facilitating the development of new business concepts where the customer is one of the fundamental parts (de Villiers et al., 2021; Hoffman & Novak, 1997; Sawhney et al., 2005). The customer has the possibility to co-create his experience of value by applying his knowledge, skills and personal experience to his service, at the service of the firm and other customers through the sharing of his experience through the channels of communication that the firm offers (Bettencourt, 1997;

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Bettencourt et al., 2002; de Villiers et al., 2021; Lengnick-Hall, 1996; Prahalad & Ramaswamy, 2000, 2002; Vargo & Lusch, 2004a).

As recognized by Vargo and Akaka (2009) and Barret et al. (2015), the development of firms focused on services and SDL is based on a development in the networked technological model, that is, through digital media. At the same time, they also considered that the view of marketing that existed at the time could not be a unified view, mainly because some of the existing principles did not fit into a logic applied to services. This support has also been verified by Dixon (1990) because he found that the development of the Marketing discipline in the future lacked a new perspective and that it was capable of meeting the technological changes in the means of investigation, people will be more and more networked through the internet and with the possibility of communicating directly with firms. New challenges were being created and that the principles that were in force at the time could not keep up with the evolution that was taking place. That led in the academic world to force a revolution in the Marketing discipline.

A crucial observation made by technology firms was the transition towards providing services free of charge or at a reduced cost, facilitated by the networked technological model and digital media. This paradigm shift was driven by the recognition that traditional marketing principles were not entirely applicable to services, particularly in the context of evolving customer interactions through the internet and direct communication with firms. Consequently, these technological advancements and changing customer dynamics necessitated a fundamental revolution within the Marketing discipline.

As a result, firms offering services recognized the need to adapt and tailor their offerings to better address the individualized needs of their customers or users. This adaptability allowed customers to modify and customize services to align with their unique requirements, leading to a more effective and personalized service delivery approach. The availability of free or cost-effective services, coupled with increased customer involvement in shaping service offerings, further reinforced the transformation of the Marketing discipline.

As well as implementing services that not the professionals of the firms execute but the customers through the means that the firms provide (Correani et al., 2020). A view that the customer is an active capital for the firm and the role that it can play for the firm in the development of new products and services, as well as finding new solutions to old problems that the firm still faces is increasingly relevant to find a solution (Ho & Chung, 2020; Villanueva et al., 2008). What stresses that the SDL is based on co-creation by the consumer is a continuous and often implicit phenomenon (Barrutia et al., 2016; Grönroos & Gummerus, 2014; Grönroos et al., 2015).

One of the underlying ideas in the SDL is that the service is seen as a concept of exchange and that implies the view of marketing strong and important norms (Gummesson et al., 2010; Vargo & Lusch, 2006), which has the consequence of having a very comprehensive view and that implies providing services to the various stakeholders among the firm and the customer, so shareholders and employees should also be included (Beekun & Badawi, 2005). From the perspective of the SDL everyone is important, and each has a fundamental role to play. They are no longer mere recipients but active creators of value, aligning with the principles of the SDL. Consequently, firms are driven to invest in operational resources and foster long-term relationships, seeking substantial improvements in service quality and transparency. These endeavors necessitate an ethical approach to foster effective service exchange and enhance sustainability (Ingenbleek, 2020). This shift in perspective reinforces the idea that service exchange involves reciprocal contributions from all stakeholders, ultimately fostering a more holistic and value-driven approach within the service ecosystem.

The change that was already taking place in firms with a view to selling services based on the sale of goods was accelerated with the presentation of the SDL (Fang, 2017; Hartwig et al., 2021). Especially in high-tech firms that made available more and more services supported on the internet to connect firms to their customers, as well as to involve them in their activities where they could share their experiences and give feedback on the products and services that were made available. But also, with the clear objective of firms providing a greater number of services to customers, which in terms of billing has allowed firms over time to increase the volume of invoicing and, consequently, to increase the profit that is the most important for them. Therefore, the increase in the provision of services did not escape the rule of distribution of goods considered tangible, the same conventional channels were used for their implementation. Therefore, over time, firms often must adapt their internal structure to adapt to the new challenges that the market imposes, as well as the most important, the relationship with customers (Meyer et al., 2011; Shocker et al., 1994).

The revolution that has been taking place over time, in which services are the basis for firms to do business, has had a significant impact on the various layers of society. The SDL brought democratization to everyone by allowing everyone to have personalized experiences, as well as being able to collaborate firms in improving their offerings (Zaborek & Mazur, 2019). This implies that firms must be open-minded to receive suggestions that can help them improve their performance, products and services. Thus, the requirements that are increasingly imposed on firms and the economy have led to the workforce and knowledge also being acquired outside its walls, that is, in the interactions of firms with their research partners, customers, suppliers and others who can somehow contribute with valid and workable ideas (Kleinaltenkamp et al., 2022; Romijn & Albaladejo, 2000). What forces firm managers to bet more and more on marketing techniques aimed at relationship strategies with customers, suppliers and all those who can contribute knowledge, whether they are firm employees or other external partners.

SDL came to present a new paradigm that implied a change in the way management and marketing plans are thought, as it is a new philosophical approach or a new thought as some critics refer (Brodie et al., 2008). But it is also agreed that this new paradigm or thought over time needs to be refined and explored to be able to know all the potentialities. In the last few years, this is what firms have been doing, but researchers at several universities have also contributed so that knowledge has evolved. Not only in the “service” aspect as presented in the SDL, but to understand all the factors that are possible to explore and find new aspects that may arise from it and new market strategies (Hartwig et al., 2021). So, it may be necessary to rethink marketing concepts and revalidate the strategies previously known, as well as discover how to implement new strategies or thoughts that may arise.

For interactions between customers and firms, as well as knowledge sharing to be developed, Information Technologies (IT) have played an extremely important role. It is about the Information Technologies and Communication (ITC) that are based on all electronic platforms and that are available via internet or intranet. They are the fastest way to collect data and turn it into information, as well as distribute it. IT allow firms to improve their services with customers, collect feedback, interact with stakeholders and access knowledge that could otherwise take a very long time (Kazadi et al., 2016; Ramaswamy & Gouillart, 2010).

The development that has occurred over time in the areas of ITC has created very high levels of mobilization and has created opportunities for shared intelligence, artificial intelligence development, cloud computing. Which has caused a very large economic change over time in many sectors of activity. Therefore, the value created in the economy is closely

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linked to information, interaction with customers and their involvement with firms. Result of transactions between firms and customers, based on ITC, having allowed more complex transactions to be carried out with the involvement of a huge amount of information and with the possibility of being carried out regardless of where the players are located.

Many of the technologies that we know today and that allow transactions at a global level, data collection and processing, data mining and others, come from the 20th century (Cooley et al., 1997; Fedushko et al., 2020; Wu et al., 2013). Many of these technologies and concepts were developed by firms, by enthusiasts as a recreational purpose to make tools and knowledge available free of charge, by university researchers or even by institutions that had the purpose of developing technologies to be used in war scenarios. As an example, the first version of the Internet was created to be used in military means, later it was made available for civilian purposes.

At the academic and business level, it is recognized that technologies substantially increase the capacity of firms to study their customers and through their behavior to extract information that leads to a greater understanding of their preferences and consumption habits. As well as they gain an ability to offer services more directed to the needs of their customers and consequently the better development of strong relationships between firms and their customers.

Since the Internet boom in the late 20th century and the emergence of the most diverse ITC, firms have had to constantly transform their production processes, interaction with their customers and knowledge development partners, as well as with its suppliers. In addition to society in general, firms were forced to be at the forefront to keep up with the technological developments that are constantly occurring. This has also allowed the creation of new channels for the sale of goods and services, which, according to the point of view of the SDL, has led to an exchange of experiences and knowledge. But technology has gone further and further by allowing customers to be able, in cases where possible, to be active and participatory elements in personalizing the good or service they purchase.

Many of the software that allows firms to develop their communication platforms are available on the Internet, just download and configure them on the servers where they will work. But this same software can also be used by people for private purposes.

The personalization power on the part of the firms that use the open-source platforms (August et al., 2021) and of the common users is a competitive advantage, since each one can add the necessary resources and that is considers more adequate to have a solution adjusted to the needs (August et al., 2021; Garousi Mokhtarzadeh et al., 2020). This is only possible due to the collective effort of volunteers from all over the world, free of charge, dispassionately puts their knowledge, skills and time at the disposal of a greater good which is free computing and without frontiers through open-source communities, but also from firms that consider the common good more important than profit and for that reason it does not lock the knowledge it has acquired over time but share it.

Open-source platforms have reached very high levels of sophistication. An example of this is Linux. Since he appeared in the 1990s, he has brought together several volunteers who, over time, have contributed to making him better and better. Since it is a free system and that each one can adjust it to their needs, as well as each one can create their own operating architecture, it allowed that several distributions were created over time. Some focused on more specific issues, such as focused network security distributions. Others, on the other hand, continue to be generalists but with the possibility of users being able to customize them to do the tasks they want.

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The versatility of Linux in terms of customization is undoubtedly an extremely important factor for users, since each one of them and according to their knowledge, availability and skills can co-create their own user experience (Palioura & Dimoulas, 2022). When in doubt, users can use the knowledge shared by other members of the community they are part of, as well as helping other members who need the knowledge they have. The spirit of mutual help is high, allowing for a continuous growth of knowledge and involvement of users with the community and with the firms that collaborate with it (Hansen & Schmitt, 2021; Romero & Molina, 2011).

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OBJECTIVES

In this section a brief approach is made to what is intended to be studied. It ends with a brief description of the thesis structure.

Many users of OSS technologies get involved in the development and improvement of operating systems in a voluntary and altruistic way. The range of activities performed by users is vast and challenging. Mainly at the level of integrating the many individual and collective needs required to achieve one's individual needs.

At first moment, the study of co-creation participation and co-creation experience is justified by the critical role that co-creation plays. To gain a comprehensive understanding of this phenomenon, it is essential to dissect co-creation into its fundamental components, which are co-creation participation and co-creation experience.

Co-creation experience, as a pivotal aspect, consists of second-order factors such as task enjoyment, autonomy, and competence, as described by Füller et al. (2011). By scrutinizing these factors, we aim to uncover the emotional and psychological dimensions that drive individuals to engage in co-creation activities actively and altruistically.

Concurrently, co-creation participation delves into broader aspects of involvement and relational elements, as recognized by Nambisan and Baron (2009) and Zhang et al. (2015). This broader perspective provides a more comprehensive view of how individuals participate, interact, and engage within co-creation processes.

Therefore, the study begins by focusing on these two fundamental elements: co-creation participation and co-creation experience, with the aim of establishing a strong research foundation. This division enables a thorough examination of the emotional and participatory factors of co-creation. This initial phase is vital for untangling the intricate dynamics of co-creation and its underlying motivators and outcomes, providing a robust basis for a more in-depth analysis.

The voluntary participation and involvement created leads one to question what motivations might predispose users to want to participate in an active and collaborative way. Especially in a context that requires constant participation to keep up with the constant changes.

Thus, the next goal is to explore the emotional aspects that act as precursors and incentives for users to engage actively and altruistically in co-creation activities. This understanding is especially important because many participants are involved in voluntary work, characterized by pro-social and pro-educational behavior, requiring personal time investment for the benefit of others. This involvement is fueled by a quest for knowledge, a sense of belonging, social recognition, and a commitment to humanism (Dacko-Pikiewicz & Walancik, 2016).

In this context, the study identifies three motivating factors: sense of community, platform identification, and innovativeness, which are closely linked to participation in OSS environments. Online communities play a crucial role in fostering interaction and identification, making the sense of community pivotal. As much of OSS development occurs on internet-based platforms, platform identification is another essential factor facilitating effective interaction.

Participants not only address their own needs but also contribute to innovation, improving the delivery of products and services, which makes innovativeness a significant motivational factor.

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These three motivational factors - sense of community, platform identification, and innovativeness - play a critical role in enhancing participation, interaction, bonding, and knowledge sharing within co-creation environments. They motivate participants to be altruistic, involved, develop relationships, and actively contribute their intellectual potential (Sarkar & Banerjee, 2019).

The study will also explore how innovativeness moderates the influence of platform identification and sense of community on co-creation experience. Next, it will examine the moderation effect of platform identification and sense of community on the relationship between co-creation experience and co-creation participation, in line with previous research that comment on the need to study moderators (Cheung & To, 2021). These moderating behaviors are essential to understanding how these precursor factors influence co-creation, both in terms of participation and experience.

Subsequently, this study explores the outcomes of co-creation, particularly its consequences. In co-creation environments, active and collaborative participation leads to perceivable direct effects, primarily due to knowledge sharing and involvement.

Participants benefit by acquiring knowledge, finding cost-effective solutions, and contributing to the improvement of products and services (Porter, 1990; Porter & Kramer, 2002; Wildavsky, 1972). These improvements often lead to economic benefits, even if they are subjective and non-monetary. Participants recognize their value in co-creation and the economic benefits they generate based on their understandings, attitudes, behaviors, and participation models, contributing to their economic sustainability.

Additionally, co-creation fosters multiple relational ties between participants, each determining the relational value of these connections (Kazadi et al., 2016; Vargo et al., 2008). The evaluation process is ongoing and influences individual psychology and social dynamics, affecting both co-creation participation and personal relationships.

Indirect effects of co-creation extend beyond the direct effects, generating feelings of satisfaction that motivate participants to evangelize and engage in future co-creation experiences (Mvondo et al., 2022; Schnurr, 2017). In this context, satisfaction, word-of-mouth, and future participation are considered indirect effects.

Co-creation is characterized by active participation in crucial activities, and future involvement depends on the satisfaction generated through participation (Abbate et al., 2019; Kohler et al., 2011). Satisfaction serves as a channel for indirect effects, driving more active communication and evangelism to express participants' interests and experiences (Füller et al., 2009; Piligrimienė et al., 2015). This communication is originated and expressed as a free action and as a form of evangelism. What becomes relevant to analyze in the context of the thesis is whether the indirect effect of co-creation extends to the point of influencing the word-of-mouth of the participants.

The thesis consists of four chapters. The first chapter provides a comprehensive literature review to elucidate essential concepts. The second chapter introduces the theoretical models developed and the hypotheses proposed. The third chapter presents the obtained results and describes the processing of collected data applied to the developed models. In the fourth chapter, the author discusses the results, highlight academic contributions, explore their implications, acknowledge the study's limitations, and suggest possibilities for future research stemming from this study.

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1 THEORETICAL BACKGROUND AND LITERATURE REVIEW

1.1 INTRODUCTION

When the article by Vargo and Lusch (2004a) dubbed "Evolving to a New Dominant Logic for Marketing" was presented, they offered a new perspective on the concepts goods and services, which came to modernize their definitions that were already rooted and accepted long time ago. In their view, services are more prevalent than goods. So, all firms are service providers, so firms that produce goods, do so only as a means of providing service to their customers (Grönroos & Gummerus, 2014; Vargo & Lusch, 2006). Therefore, in this perspective, goods are seen as a means for firms to provide services. They present the Service Dominant-Logic (SDL) in marketing.

At the core of SDL is the concept of service, which is defined as the application of specialized competencies and resources for the benefit of others. Service is not limited to traditional service industries but encompasses all economic activities, including manufacturing and retailing. SDL suggests that service is the fundamental basis for all economic exchange and value creation.

Embedded within the paradigm of SDL is the foundational premise that service is inherently characterized by the concept of exchange. This perspective, underscored by robust and salient marketing norms elucidated by Gummesson et al. (2010) and Vargo and Lusch (2006), engenders a comprehensive framework. Within this framework, the provision of services transcends conventional boundaries, extending its purview to encompass diverse stakeholders within the symbiotic relationship between firms and customers. Notably, this expansive stance necessitates the inclusion of shareholders and employees as integral participants, as underscored by Beekun and Badawi (2005).

Importantly, the SDL lens underscores the egalitarian significance of each constituent, casting them in pivotal roles. Within the intricate tapestry of operational resources, one discerns the convergence of customers, employees, and collaborating organizations, each contributing synergistically to the progression of firms' regular activities. These entities are intrinsically interwoven into the very fabric of organizational processes, serving as the conduit through which exchange and value co-creation unfold, a concept elucidated by Ingenbleek (2020). This transformative perspective effaces the conventional demarcation between suppliers and recipients, rendering all participants not only as co-creators but also as beneficiaries of value. Consequently, the traditional construct of supply and demand undergoes a perceptual shift, ultimately dissolving within the dynamic realm of service-centric exchange. It is thus within this holistic landscape that the essence of SDL thrives, converging seamlessly with the foundational and conclusive notions presented earlier.

The service only unique reason is not to have exchange, for Vargo and Akaka (2009, p. 33) "the service system is to connect people, technology and information through value propositions with the aim of co-creating value for the service system participating in the exchange of resources system within and across system". Connecting the firm with the people using technology and information can create social interaction, share risk, merge news ideas in new service, organize demands, articulate the best practices, learn, and understand customers. This can lead to the development of innovative and customized services that meet the specific needs and preferences of customers and can also help firms build strong relationships with their customers, which can lead to increased loyalty and repeat business over time.

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Grönroos (2008b) argued adopting a service logic and creating interactions with costumers provide the firm with an extended role in value creation and instead of being restricted to action as a value facilitator only, the firm can actively take a role in the customers' value-generating processes, directly influence them, and become a co-creator of value with its customers. This shift towards a service logic emphasizes the importance of building and maintaining strong relationships with customers and understanding their needs and preferences to better tailor offerings that meet their specific requirements.

This perspective encourages businesses to view their customers as partners in the value creation process and to involve them in every step of the service delivery process. SDL encourages businesses to view their customers as active participants in the value creation process rather than passive recipients of goods and services (Paswan et al., 2009). With the approach proposed by SDL, the customer gains a central and active role (Maull et al., 2012), where the customer is involved to co-create his worthwhile experience (Tossavainen, 2017). Thus, SDL emphasizes the importance of understanding customers' needs, preferences, and expectations and working collaboratively with them to design and deliver services that meet those needs.

By doing so, firms can create more personalized and engaging experiences for their customers, which can lead to increased customer loyalty and satisfaction, as customers feel that their individual needs and preferences are being considered. In addition, by co-creating value with customers, firms can gain valuable insights into their customers' behaviors and preferences, which can be used to improve their offerings and stay ahead of the competition. By working closely with customers, firms can identify areas for improvement and develop new products and services that better meet the needs of their target market. This approach to value creation can help businesses build stronger, more sustainable relationships with their customers. By providing personalized services that meet customers' needs and preferences, businesses can foster customer loyalty and create long-term value for all stakeholders. Ultimately, this can lead to increased profitability and sustainable long-term growth for the firm.

SDL therefore emphasizes the importance of customer experience in value creation (Grönroos & Voima, 2013). SDL suggests that customer experience is not limited to the interactions between customers and firms but encompasses all interactions and touchpoints across the entire value chain (Vakulenko et al., 2019b). Therefore, firms should focus on creating a positive customer experience by engaging with customers in the co-creation process and continuously improving the customer experience (Shrivastava, 2016).

Moreover, in the context of co-creation, SDL suggests that firms should collaborate with customers and other stakeholders to co-create value. Thus, SDL also emphasizes the importance of collaboration among stakeholders in the value creation process. By working collaboratively with suppliers, partners, and other stakeholders, businesses can create value that benefits all parties involved.

In summary, co-creation is at the core of everything SDL stands for. SDL emphasizes the importance of co-creation in value creation and suggests that firms should collaborate with customers and other stakeholders to co-create value. SDL also emphasizes the importance of customer experience in value creation, suggesting that firms should focus on creating a positive customer experience by engaging with customers in the co-creation process and continuously improving the customer experience.

SDL came to present a new paradigm that implied a change in the way management and marketing plans are thought, as it is a new philosophical approach or a new thought as some critics refer (Brodie et al., 2008). The presentation of this new perspective has provoked a

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huge discussion that has continued over time and created new concepts and new approaches, both in the discipline of marketing and in the relationship of customers with firms.

But it is also agreed that this new paradigm or thought over time needs to be refined and explored in order to be able to know all the potentialities. In the last few years, this is what firms have been doing, but researchers at several universities have also contributed so that knowledge has evolved. Not only in the "service" aspect as presented in the SDL, but to understand all the factors that are possible to explore and find new aspects that may arise from it and new market strategies (Hartwig et al., 2021). So, it may be necessary to rethink marketing concepts and revalidate the strategies previously known, as well as discover how to implement new strategies or thoughts that may arise.

1.2 ORIGIN AND DEVELOPMENT OF SERVICE-DOMINANT LOGIC

Originally, economic exchange was based on an individual exchange of skills as if it were a service-for-service exchange (Vargo et al., 2008). People often traded goods and services directly with one another, based on a barter system where each party exchanged something of value for something else. However, as economies grew and became more complex, the direct exchange of goods and services became less practical, and firms emerged to facilitate these exchanges.

With this change, the focus was on tangible good, transaction and embedded value (Vargo & Lusch, 2004a). With the shift towards a goods-dominant logic, the emphasis was on the tangible product and the transactional exchange of value. The value was seen as embedded in the product or service, rather than being co-created through interactions between the firm and the customer. As firms became larger and more specialized, they began to focus less on direct customer interaction and more on optimizing their production and distribution processes. This approach was characterized by a focus on production efficiency, standardization, and mass marketing. This led to the development of more complex economic systems, such as marketplaces and supply chains, which allowed goods and services to be exchanged more efficiently and at a larger scale. However, with this increased complexity came a greater distance between firms and their customers, and firms had to find new ways to engage with and understand their customers' needs and preferences to stay competitive.

As demand for more sophisticated and customized products and services grew, firms had to adapt their marketing strategies to better meet the needs and preferences of their customers. This led to the emergence of new marketing approaches such as relationship marketing, which focused on building long-term relationships with customers based on mutual trust and respect. In recent decades, there has been a strong study on services and innovation in the most diverse areas in which they have an impact. Marketing is one of the areas that is most investigated by several researchers (Berry et al., 2006; Oliveira & von Hippel, 2011) as well as their impact on the economy and economical activities (Cainelli et al., 2006; Edvardsson & Olsson, 1996; Oke, 2007).

In these studies, two schools of thought can be identified. The first is aligned with the differences between product innovation and service innovation and defend a new set of service innovation theories and models are needed to better understand the whole innovations process (Edvardsson & Olsson, 1996). So, for this school of thought, there are individual firms that act as service producers and costumers as service consumer, supported by a relationship producer-consumer (Berry et al., 2006; Thomke, 2003) and largely based on distinctions in the nature of product and process innovation, reflecting a product-process division (Davenport, 2005; Sheehan, 2006). This perspective emphasizes the relationship

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between service providers and customers and the role of the producer-consumer relationship in service innovation.

Additionally, this first school of thought argues that the service sector is different from the product sector in several ways (Cho, 2006), which makes the innovation process in the service sector more complex and challenging (Grove et al., 1996; Hollins, 1993), namely:

- Intangibility - Services are intangible, which means that they cannot be touched, seen, or tasted before they are consumed. This makes it harder to evaluate and communicate the value of a service to customers and requires a different set of competencies and capabilities to innovate successfully.
- Heterogeneity - Services are often highly customized and vary from one customer to another, making it challenging to standardize service delivery and scale innovation across different customers and markets.
- Inseparability - Services are inseparable from the service provider, which means that the quality of the service depends on the skills and behavior of the service provider. This requires a different approach to innovation, where the focus is on co-creating value with the customer and involving the service provider in the innovation process.
- Perishability - Services cannot be stored or inventoried, which means that they must be produced and consumed at the same time. This requires a real-time approach to innovation, where the focus is on creating value for the customer in the moment of service delivery.

Thus, service innovation is distinct from product innovation and requires a new set of theories and models to understand the innovation process in the service sector (Barras, 1986; Howells, 2010). For example, service design thinking, customer journey mapping, and service blueprinting are some of the innovative approaches that have been developed specifically for the service sector to better understand the customer's needs and preferences and co-create value with them.

Moreover, the first school of thought emphasizes the relationship between service providers and customers as a key element of service innovation. In the service sector, the customer is often involved in the co-creation of value, meaning that the customer's needs and preferences must be considered in the innovation process (Payne et al., 2009). This perspective highlights the need for a customer-centric approach to service innovation, where the focus is on creating value for the customer through the co-creation of new and improved services. This requires a different approach to innovation than in the product sector, where the producer typically creates the value proposition independently of the customer.

The second school of thought downplays the differences between product and service innovation and emphasizes the need for common frameworks that can be applied to both types of innovation. It views service innovation as part of a broader innovation process and seeks to integrate existing theories and models from the product innovation context into the service innovation context. The main focus of this school is looking for the existing theories and innovations models to integrate in the service innovation context to be easier to interpret and have greater applicability by firms in the development of products and services (Nijssen et al., 2006).

Additionally, the second school of thought argues that many of the principles and frameworks developed for product innovation can be applied to service innovation as well:

- Stage-gate model - The stage-gate model is a framework for managing the innovation process that involves dividing it into distinct stages and gates. Each stage involves a set of activities that need to be completed before moving on to the

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next stage, and each gate involves a decision point where the project is evaluated before moving on to the next stage. This model can be applied to both product and service innovation to ensure that innovation projects are managed effectively and efficiently.

- Lean startup methodology - The lean startup methodology is an approach to innovation that emphasizes rapid experimentation and learning. It involves creating a minimum viable product and testing it with customers to gather feedback and iterate on the product or service. This methodology can be used for both product and service innovation to ensure that innovation projects are customer-focused and based on real-world feedback.
- Design thinking - Design thinking is a human-centered approach to innovation that involves understanding the needs and preferences of customers and using that information to design products and services that meet those needs. This approach can be used for both product and service innovation to ensure that innovation projects are based on a deep understanding of customer needs and preferences.
- Business model canvas - The business model canvas is a framework that helps to describe, design, and evaluate business models. It involves a process of mapping out the key components of a business model, such as customer segments, value propositions, channels, revenue streams, and cost structure, to identify areas for innovation and improvement.
- Agile development - Agile development is a framework for software development that emphasizes collaboration, flexibility, and iterative development. It involves a process of rapid prototyping, testing, and feedback to develop software products that meet the needs of customers.

These innovation models can be applied to both product and service innovation (Tseng et al., 2019), but they may need to be adapted to the specific context of the innovation project (Keiningham et al., 2020):

- Stage-gate model - In service innovation, the stage-gate model may need to be adapted to account for the need for co-creation with customers and real-time feedback. This may involve adding additional stages to the model to include activities such as customer research, customer co-creation workshops, and prototyping and testing with customers.
- Lean startup methodology - In service innovation, the lean startup methodology may need to be adapted to account for the unique characteristics of service design, such as the importance of designing customer journeys and touchpoints. This may involve incorporating service design tools and techniques into the lean startup process, such as customer journey mapping, service blueprinting, and service prototyping.
- Design thinking - In service innovation, design thinking may need to be adapted to account for the importance of co-creation with customers and other stakeholders. This may involve using design thinking tools and techniques to facilitate co-creation workshops with customers and other stakeholders, and to gather feedback and insights throughout the innovation process.

Also, it emphasizes the need for common frameworks that can be applied to both types of innovation. This is because many firms today are not purely focused on either products or services but rather offer a combination of both. In such cases, it becomes important to have a common language and approach to innovation that can be used across the organization. This requires the development of common frameworks and tools that can be applied to both

product and service innovation. By using common frameworks, firms can create a shared understanding of the innovation process and improve communication and collaboration across different functions and departments. This can help to break down silos within the organization and foster a culture of innovation that is focused on delivering value to customers.

Moreover, common frameworks can help to standardize innovation processes across the organization, which can help to reduce costs, increase efficiency, and improve the quality of innovation outcomes. This can ultimately lead to the development of new products and services that meet the evolving needs of customers and drive growth for the organization.

In opinion of Ordanini and Parasuraman (2011), the insights derived from both schools are important, but they are ad hoc, fragmented, and prone to technology-base innovations. This has been reflected in the studies because the researchers have focused on adopting an integrated system, with approaches very synthesized in innovation study services (Gallouj & Savona, 2009; Ordanini & Parasuraman, 2011).

At the same time, it should be noted that in the 1990s there was a technological boom and that made the planet a small global village, at the expense of the rapid development of the Internet (Dede, 1990; Ger, 1999; Goldenberg & Levy, 2009). The latter allowed firms and customers to relate directly which eliminated barriers that previously existed and did not allow communication. What led to a greater interaction between firms and customers, which has been increasingly facilitating the development of new business concepts where the customer is one of the fundamental parts (de Villiers et al., 2021; Hoffman & Novak, 1997; Sawhney et al., 2005).

As a result, in 1990, Dixon (1990) stated that the development of the marketing discipline needed a new perspective that was capable of meeting the technological changes in the means of investigation, since people were going to be more and more networked through the Internet and with the possibility of communicating directly with firms. New challenges were being created and the principles that were in force at the time could not keep up with the evolution that was taking place. That led in the academic world to force a revolution in the marketing discipline.

Thus, although the dominant mental model that was the base for the models of entrepreneurs and others involved in innovation up to this moment was the Good-Dominant Logic (GDL) (Vargo & Lusch, 2004a, 2008a, 2008b), the recent marketing strives to resemble its original state of individual economic exchange (Vargo & Lusch, 2004a).

Vargo and Lusch (2004a) propose a new approach about a dominant logic of marketing where the service is central, and all transaction are service. They propose the SDL like a new paradigm of marketing where goods and services are no longer viewed in the same conventional sense. According to this perspective, the service becomes the center of exchange and goods are a service provision. So, firms are providing services where those that produce goods are only “transmitting” their services to the customer.

The SDL establish a new relationship between the firms and the customers. The customer is view like a co-creator of value and participate in determining the value service (Vargo & Lusch, 2004a, 2006). The customer's role in the industrial system has gone from isolated, unconscious and passive to connected, informed and active (Prahalad & Ramaswamy, 2004a). The SDL approach to marketing emphasizes the active role of the customer in co-creating value with the firm. Customers are seen as co-creators of value, rather than passive recipients of value created by the firm. This approach acknowledges that customers bring their own resources, skills, and knowledge to the table, and that the firm and the customer can collaborate to create value through the exchange of service.

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The SDL makes a distinction between the terms “service” (singular) and “services” (plural). The “service” is to reflect “process of using one's resources for the benefit of another entity” (Lusch et al., 2007; Vargo & Lusch, 2004a, 2006, 2008b). The “services” is to reflect “a special type of output – intangible product” (Vargo & Lusch, 2008b, p. 2) as “the application of specialized competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself” (Vargo & Lusch, 2004a, p. 2). In simpler terms, "service" is the act of serving, while "services" are the products or outcomes of that act. This distinction is important because it recognizes that services are not just something that firms provide to customers but are also an integral part of the value creation process (Vargo & Lusch, 2008c). It emphasizes the importance of specialized knowledge and skills in creating value for customers and highlights the role of the customer in co-creating value with the service provider.

From the early studies it is emphasized the importance of having a dominant logic of mental or institutional models to define how organizations and entrepreneurs interpret and learn about new opportunities and their benefits (North, 1994). As recognized by Vargo and Akaka (2009) and Barret et al. (2015), the development of firms focused on services and SDL is based on a development in the networked technological model, that is, through digital media. At the same time, they also considered that the view of marketing that existed at the time could not be a unified view, mainly because some of the existing principles did not fit into a logic applied to services. Vargo and Lusch (2004a) argued traditional GDL has been insufficient to understand current markets, economic exchanges, and marketing. According to these authors, the traditional GDL is very focused on tangible resources, embedded value, and transactions. New perspectives emphasize tangible resources, co-creation of value, and the relationships that converge to a new SDL in which the provision of services and goods is important for economic exchange (Spohrer et al., 2007; Spohrer et al., 2008). Vargo and Lusch (2004a) express SDL represents a shift in the dominant logic of marketing from a GDL to an inclusive dominant logic integrating goods with services to develop new practices.

For Lamberti and Paladino (2013), the SDL has presented like a new unifying theory for marketing thought. Lamberti and Paladino (2013) also argue that SDL provides a more customer-centric approach to marketing that focuses on co-creating value with customers, rather than simply selling products to them. With the same intention, Maglio and Spohrer (2008, p. 19) argued “SDL might provide just the right perspective, vocabulary, and assumptions on which to build a theory of service systems, their configurations, and their modes of interaction” and complement with the idea “SDL may be the philosophical foundation of service science, and the service system may be its basic theoretical construct”.

Thus, SDL and GDL are two different perspectives or frameworks for understanding the nature of economic exchange (Woratschek et al., 2014). Both SDL and GDL are frameworks for understanding economic exchange, but they have different orientations, resource views, and value creation processes. Here's an initial comparison between the two:

- Focus - The primary focus of SDL is on services, while the primary focus of GDL is on physical goods.
- Value creation - In SDL, value is created through collaboration and co-creation between the service provider and the service customer. In contrast, in GDL, value is created by the manufacturer or producer and transferred to the customer through the exchange of goods.
- Resources - In SDL, resources are seen as operant resources, such as knowledge, skills, and abilities, which are used in the co-creation of value. In GDL, resources are seen as operand resources, such as physical goods, that are used to create value.

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- Orientation - SDL has a customer-centric orientation, where the focus is on understanding the needs and wants of the customer and co-creating value with them. In GDL, the orientation is more product-centric, where the focus is on creating and selling products that meet the needs of the market.
- Interaction - SDL emphasizes the importance of interaction, dialogue, and learning between the service provider and the service customer in the value co-creation process. GDL, on the other hand, places less emphasis on interaction and more emphasis on efficient production and distribution of goods.

SDL places a strong emphasis on collaboration, co-creation, and customer participation in the value creation process. This means that the focus is on understanding the needs and wants of the customer and working together to co-create value that meets those needs. The service provider and the service customer are seen as co-creators of value, and the role of the service provider is to facilitate and support the value co-creation process.

In contrast, GDL places a stronger emphasis on efficient production and distribution of goods. The focus is on creating products that are cost-effective to produce and can be distributed efficiently to the market. In GDL, the manufacturer or producer is seen as the creator of value, and the role of the customer is to purchase and consume the products that are produced.

The emphasis on collaboration and co-creation in SDL leads to a more customer-centric approach to value creation, while the focus on production and distribution in GDL leads to a more product-centric approach.

In the following paragraphs and tables different comparisons made by relevant authors are presented. First, a comparison made by Vargo and Lusch (2004a) between Good-Centered Dominant Logic and Service-Centered Dominant Logic is shown.

Table 1. Traditional Good-Centered Dominant Logic vs Emerging Service-Centered Dominant Logic

	Traditional Good-Centered Dominant Logic	**Emerging Service-Centered Dominant Logic**
Primary unit of Exchange	People exchange for good. These goods serve primarily as **operand resources**.	People exchange to acquire the benefits of specialized competences (knowledge and skills), or services. Knowledge and skills are **operant resources.**
Role of goods	Goods are **operand resources** and end products. Marketers take matter and change its from, place time, and possession.	Goods are transmitters of **operant resources** (embedded knowledge); they are intermediate products that are used by other **operant resources** (customers) as appliances in value creation processes.
Role of customer	The customer is the recipient of goods. Marketers do things to customers; they segment them, penetrate them, distribute to them, and promote to them.	The customer is a co-producer of service. Marketing is a process of doing things in interaction with the customer. The customer is primarily an

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	Traditional Good-Centered Dominant Logic	Emerging Service-Centered Dominant Logic
	The customer is an **operand resource**.	**operant resource**, only functioning occasionally as an **operand resource**.
Determination and meaning of value	Value is determined by the producer. It is embedded in the **operand resource** (goods) and is defined in terms of exchange-value.	Value is perceived and determined by the consumer on the basis of value in use. Value results from the beneficial application of **operant resources** sometimes transmitted through **operand resources**. Firms can only make value propositions.
Firm—customer interaction	The customer is an **operand resource**. Customers are acted on to create transactions with resources.	The customer is primarily an **operant resource**. Customers are active participants in relational exchanges and coproduction.
Source of economic growth	Wealth is obtained from surplus tangible resources and goods. Wealth consists of owning, controlling, and producing **operand resources**.	Wealth is obtained through the application and exchange of specialized knowledge and skills. It represents the right to the future use of **operant resources**.

Source: Own elaboration based on Vargo and Lusch (2004a, p. 7)

Later, Vargo et al. (2008) presented a new classification of the differences between the two concepts, SDL and GDL.

Table 2. The difference between SDL and GDL

	Good-Dominant Logic	Service-Dominant Logic
Value driver	Value-in-exchange	Value-in-use or value-in-context
Creator of value	Firm, often with input from firms in a supply chain	Firm, network partners and customers
Process of value creation	Firms embed value in “goods” or “services”, value is “added” by enhancing or increasing attributes	Firms propose value through market offerings, customers continue value-creation process through use
Purpose of value	Increase wealth for the firm	Increase adaptability, survivability, and system wellbeing through service (applied knowledge and skills) of others
Measurement of value	The amount of nominal value, price received in exchange	The adaptability and survivability of the beneficiary

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	Good-Dominant Logic	Service-Dominant Logic
		system
Resources used	Primarily operand resources	Primarily operant resources, sometimes transferred by embedding them in operand resources-goods
Role of firm	Produce and distribute value	Propose and co-create-value, provide service
Role of goods	Units of output, operand resources that are embedded with value	Vehicle for operant resources, enables access to benefits of firm competences
Role of customers	To 'use up' or 'destroy' value created by the firm	Co-Create value through the integration of firm-provided resources with other private and public resources

Source: Own elaboration based on Vargo et al. (2008, p. 148)

Finally, in their influential work, Skålén and Edvardsson (2015) delve into the fundamental disparities between GDL and SDL. The authors underscore the essential transformations that businesses and enterprises must embark upon to effectively transition from one logic to another, a shift that has significant implications for their operations, strategies, and overall approach to value creation.

GDL traditionally underpins the conventional way of thinking about business, where tangible products take center stage. This logic emphasizes the production, distribution, and exchange of physical goods as the primary drivers of economic activity. However, in a dynamic and ever-evolving marketplace, the authors argue that firms must adapt to a new paradigm: Service-Dominant Logic.

SDL, as outlined by Skålén and Edvardsson (2015) and Skålén et al. (2015), underscores the importance of service as the fundamental unit of exchange and value creation. In this perspective, value is co-created through collaborative engagements and interactions between service providers and customers. Products are seen as a conduit for services, and value is more about the benefits derived from the use of these products rather than the products themselves.

For businesses to transition from GDL to SDL, they must embrace a series of transformative changes. These changes include reimagining their value propositions, shifting their focus from selling products to delivering experiences, and fostering customer-centricity. The role of employees in service provision becomes crucial, as they are seen as co-creators of value in collaboration with customers.

The move from GDL to SDL involves a shift not only in mindset but also in organizational structures and strategies. Firms need to adapt their business models, integrate technology for improved customer engagement, and cultivate a culture of innovation and continuous learning. Furthermore, they must be prepared to continuously evolve in response to changing customer needs and market dynamics.

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Table 3. The relevant key differences between the GDL and SDL with the implied transformation

	Good-Dominant Logic	Service-Dominant Logic	Implied transformation
Relationship with the market	Value produced internally within organizations	Value co-created collaboratively with customers	From producing value through predefined processes to creating value in collaboration with customers
Role of resources	Emphasis on operand resources	Emphasis on operant resources	From focusing on tangible products and services to focusing on the skills, abilities, and performance of customers and employees
Conceptualization of value	Objective	Subjective	From standardized offerings to diversifying offerings so that they suit different types of customers' value creation processes.
Realization of value	Value embedded in offerings during the production process	Value realized when customers use firm offerings	From focusing on embedding value efficiently into products and services to making sure that customers realize value through the integration of resources provided by the firm
Role of employees	Employees embed value in products and services	Employees co-create value with customers	From employees adding value to products and services during a closed manufacturing-like production process to employees co-creating value with customers
Role of leadership	Coercive leadership	Servant leadership	From controlling employees tightly to empowering them to use their skills and knowledge to engage in customers' value creation processes

Source: Own elaboration based on Skålén and Edvardsson (2015, p. 5)

It's evident that SDL indeed marks a significant departure from traditional marketing paradigms. It advocates a fundamental reorientation in how businesses perceive and provide value to their customers.

In the realm of SDL, the focus is on forging enduring relationships with customers, with an emphasis on long-term engagement rather than mere transactions. The concept of value creation takes on a collaborative dimension, as it's no longer a one-way delivery but a co-creation process between service providers and customers. In this context, customers are not passive recipients of value; instead, they become active contributors to the value generation process.

This shift in perspective reflects recognition of the evolving dynamics of the contemporary marketplace, where businesses thrive by fostering strong, interactive, and value-rich relationships with their clientele. The service provider-customer interaction becomes a dynamic, continuous, and reciprocal exchange where both parties play integral roles in shaping and refining the value they seek.

By embracing SDL and its underlying principles, organizations are better equipped to navigate the complex and interconnected landscape of the service-dominant economy. They recognize that the key to sustainable success lies in co-creating value with their customers and

placing the customer at the heart of their strategies and operations. This strategic shift not only drives business growth but also fosters a deeper, more meaningful connection between firms and their customers.

1.3 FOUNDATIONAL PRINCIPLES OF SERVICE-DOMINANT LOGIC

The SDL is a framework that emphasizes the importance of services and relationships in the creation of value. The initial eight foundational premises (FP) of the SDL were proposed by Vargo and Lusch (2004a), but since then, the framework has undergone several revisions and refinements.

Vargo and Lusch (2006) proposed a revision to the SDL that emphasized the co-creation of value and the importance of the customer as a co-creator. Vargo and Lusch (2008b) further refined the SDL to incorporate the idea of value propositions and value co-creation systems. Vargo and Lusch (2016) proposed another revision that expanded the framework to include a focus on institutions and institutional logics.

In the wake of these extensive revisions and meticulous refinements, the initial set of 8 FP underwent a transformation, evolving into a comprehensive set of eleven FP. In this process, certain FP were designated as axioms, which are essentially self-evident truths or fundamental assumptions that serve as the bedrock of a given theory or framework.

The eleven FP of SDL encapsulate the core principles that underpin this paradigm shift in thinking about value creation, service provision, and business strategy. They represent the guiding principles that help businesses and scholars navigate the shifting landscape of modern commerce. These FP not only reflect the theoretical underpinnings of SDL but also offer actionable insights for organizations seeking to embrace and implement this new perspective.

Table 4 provides a concise summary of these eleven FP, outlining their significance and relationship within the SDL framework. By categorizing some of them as axioms, SDL underscores their indisputable nature and their critical role in shaping the entire theory. As such, these FP and axioms serve as the intellectual foundation upon which the service-dominant economy is built, guiding organizations and researchers alike in understanding and adapting to the evolving dynamics of the market.

Table 4. Foundation Premises

Axiom 1	FP1	Service is the fundamental basis of exchange.
	FP2	Indirect exchange masks the fundamental basis of exchange.
	FP3	Goods are a distribution mechanism for service provision.
	FP4	Operant resources are the fundamental source of strategic benefit.
	FP5	All economies are service economies.
Axiom 2	FP6	Value is co-created by multiple actors, always including the beneficiary.
	FP7	Actors cannot deliver value but can participate in the creation and offering of value propositions.
	FP8	A service-centered view is inherently beneficiary oriented and relational.
Axiom 3	FP9	All social and economic actors are resource integrators.
Axiom 4	FP10	Value is always uniquely and phenomenologically determined by the beneficiary.
Axiom 5	FP11	Value co-creation is coordinated through actor-generated institutions and institutional arrangements.

Source: Own elaboration based on Vargo and Lusch (2016)

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A small explanation of these eleven FP is next presented.

- First axiom and first foundational premise - "Service is the fundamental basis of exchange" - actors bring to market their mental and physical skills - operant resources - that are not homogeneously distributed in the population so that actors do not have all the necessary resources to make their system workable. Given the specialization of the actors in the provision of specific services, the exchange of service by service is essential for the viability of the exchange system considered (Lusch & Vargo, 2014).
- Second foundational premise - "Indirect exchange masks the fundamental basis of exchange" - when an actor does not directly interact with whom he or she is serving, listening to the beneficiary's voice is even more complicated. Service exchanges can be masked by exchanges in which what one of the actors offers is the payment of an amount of money and the reception of goods or services in exchange. However, the fundamental process is not changed. Even so, the actors exchange collective or individual abilities with other actors so that money, goods, and services are only the vehicles or intermediaries (Lusch & Vargo, 2014).
- Third foundational premise - "Goods are distribution mechanisms for service provision" - goods are vehicles which enable service exchange and work as distribution mechanisms for the distribution of applied skills to the extent that actors engaged in the production process have knowledge that can be transformed into goods (Lusch & Vargo, 2014).
- Fourth foundational premise - "Operant resources are the fundamental source of strategic benefit" - raw materials, instruments, and other operand resources are static and passive because they are processed by operant resources, such as knowledge and human skills. Thus, only actors who own operant resources can obtain lasting competitive advantage (Lusch & Vargo, 2014; Vargo & Lusch, 2016).
- Fifth foundational premise - "All economies are service economies" - the fundamental process of economic exchange refers to the application of physical and mental skills in service provision. That implies, service and operant resources are the essence of economic activity, and as the exchanges are, in the end, service exchanges, all economies are indeed service economies. Thus, the traditional classification of economy in primary, secondary, and tertiary sectors is dated (Lusch & Vargo, 2014).
- Second axiom and sixth foundational premise - "Value is co-created by multiple actors, always including the beneficiary" - this axiom emphasizes that value is co-create by various actors in the production line of a product or service, including the beneficiary itself. However, the beneficiary continues the process of creating value when it uses the product or integrates it with other resources. The comprehension of this axiom is facilitated by the adoption of the term A2A ("actor-actor") and when the need for interaction of the actors to increase the viability of their systems is properly understood, so human beings organize themselves in networks with the aim of connect to resources that connect them to other individuals and resources (Lusch & Vargo, 2014; Vargo & Lusch, 2016).
- Seventh foundational premise - "Actors cannot deliver value but can participate in the creation and offering of value propositions" - in this context, "actors" are enterprises and can offer a promise that can be fulfilled by its interaction with the beneficiary actor; the value proposition can be increased or partially experienced

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by users, depending on the way they integrate their resources (Lusch & Vargo, 2014; Vargo & Lusch, 2016).

- Eighth foundational premise - "A service-centered view is inherently customer oriented and relational" - the nature of co-creation is also relational since exchange activities combine independently and interactively through time to co-create value. So, the service-centered view is intrinsically oriented to the customer and has a relational character. In GDL, relationship management promotes customer orientation, i.e., there is not a customer re-orientation. However, as SDL focus on actors' value co-creation, the relationship is not optional, considering that even when there is no economic transaction, there is still a relationship with the beneficiary actor (Lusch & Vargo, 2014).
- Third axiom and ninth foundational premise - "All social and economic actors are resource integrators" - the actors surpass immediate service exchange and create networks and resources to co-create value (Lusch & Vargo, 2014; Vargo & Lusch, 2016). In the context of the SDL, the actors trying to improve the viability of their systems by means of exchanges and the integration of market, public or private resources.
- Fourth axiom and tenth foundational premise - "Value is always uniquely and phenomenologically determined by the beneficiary" - for each actor, the mix generated by the mixing of actors and resources corresponds to a sense of value and satisfaction with the experience that is obtained, so the emerging value in each context is different because it always involves the availability, integration and use of a peculiar combination of resources and actors (Lusch & Vargo, 2014).
- Fifth axiom and eleventh foundational premise - "Value co-creation is coordinated through actor generated institutions and institutional arrangements" - the institutions are the bases for cooperation and coordination in service ecosystems, making possible and potentializing exchanges, value co-creation, and resources integration (Vargo & Lusch, 2016).

Furthermore, due to their relevance, the axions are more justified in the following section.

- Axiom 1 - Service is co-created - This fundamental principle posits that a service is not merely delivered by a singular entity; instead, it is collaboratively shaped through the dynamic interaction between the service provider and the service customer.
- Axiom 2 - Value is always co-created with the beneficiary - This axiom underscores the notion that value is not an inherent quality residing within a product or service. Rather, it is contingent upon the individual who benefits from it, shaped by their distinct experiences and perspectives.
- Axiom 3 - The customer is always a co-creator of value - This axiom accentuates the pivotal role of the customer as an active participant in the value creation process. It advocates for viewing the customer not merely as a passive recipient but as an integral contributor to the overall value proposition.
- Axiom 4 - The enterprise can only make value propositions - This axiom asserts that the determination of a product or service's value ultimately rests with the customer. The enterprise, in this context, can only present value propositions or offers, with the final assessment residing in the hands of the customer.
- Axiom 5 - Value is always uniquely and phenomenologically determined - This axiom underscores the subjective nature of value, emphasizing that it is contingent on the individual who undergoes the experience. The determination of value is

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intricately linked to unique perspectives and personal circumstances, making it a phenomenological and individualized assessment.

Table 5. Axioms Explanations and Justifications

Axiom	FP	Explanation and Justification
1	FP1	The application of operant resources (knowledge and skills), "service", is the basis for all exchange. Service is exchange for service.
2	FP6	Implies value creation is interactional and combinatorial.
3	FP9	Implies the context of value creation is network of networks (resources integrators).
4	FP10	Value is idiosyncratic, experiential, contextual and meaning laden.
5	FP11	Institutions provide the glue for value co-creation through service-for-service exchange.

Source: Own elaboration based on Vargo and Lusch (2016)

These axioms suggest that value is co-created through interaction and collaboration between the service provider and the service customer, and that the customer is an active participant in the value creation process. Additionally, the axioms emphasize the importance of subjective experiences and the unique perspectives of everyone in determining value. By understanding these axioms, businesses and organizations can focus on creating value through service, collaboration, and co-creation with their customers, rather than just providing products or services in a transactional manner.

To summarize the FP, Lamberti and Paladino (2013) argued the FP encompasses three core concepts:

- The interactive nature of value generation, which is related to the axioms that emphasize the importance of co-creation and interaction between the service provider and the service customer. This concept highlights that value is not created in isolation but through collaboration and mutual exchange.
- The centrality of operant resources, which refers to the axioms that emphasize the importance of resources that are used in service provision, such as knowledge, skills, and abilities. This concept highlights the idea that resources are not just physical or tangible but also include intangible resources that are required for service provision.
- The participative nature of value generation, which emphasizes the importance of the customer as an active participant in the value creation process, rather than just a passive recipient of a product or service. This concept highlights the idea that value is co-created through dialogue and participation between the service provider and the service customer.

Overall, these three core concepts help to provide a deeper understanding of the SDL framework and its emphasis on collaboration, interaction, and participation in value creation.

As a result, the eleven FP can be effectively categorized into three distinct groups in line with these core principles, each shedding light on various facets of the value co-creation process. These groupings provide a structured understanding of how SDL fundamentally reshapes the perception and engagement in economic activities.

The first group, comprising several of FP, centers on the idea that services have the potential to create value. This perspective underscores the dynamic and multifaceted nature of value, emphasizing that it is not an isolated, fixed entity but a conceptual and interactive

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construct. In this paradigm, value emerges through the interactions and engagements between service providers and customers, and it is subject to interpretation, negotiation, and co-creation.

The second group of premises is concerned with the resources necessary for enabling these interactions and facilitating the delivery of services. It highlights the pivotal role of resources, both tangible and intangible, in mediating the exchange and co-creation of value. These resources serve as the building blocks for orchestrating service experiences and form the essential infrastructure for service delivery.

Lastly, the third group of premises underscores the concept of participation as a central element in value co-creation. It emphasizes that all actors involved, including customers, service providers, and other stakeholders, actively participate in the value creation process. This collaborative participation extends to all actions needed to produce a service, underscoring the interconnectedness of the service ecosystem and the shared responsibility for value generation.

Table 6. Foundation Premises regrouped

Interactive Values	Resources	Participate Value
FP1 - Service is the fundamental basis of exchange. FP2 - Indirect exchange masks the fundamental basis of exchange. FP3 - Goods are a distribution mechanism for service provision. FP5 - All economies are service economies.	FP4 - Operant resources are the fundamental source of strategic benefit. FP9 - All social and economic actors are resource integrators.	FP6 - Value is co-created by multiple actors, always including the beneficiary. FP8 - A service-centered view is inherently beneficiary oriented and relational. FP7 - Actors cannot deliver value but can participate in the creation and offering of value propositions. FP10 - Value is always uniquely and phenomenologically determined by the beneficiary. FP11- Value co-creation is coordinated through actor-generated institutions and institutional arrangements.

Source: Own elaboration

In essence, these groupings of FP provide a comprehensive framework for understanding the underpinnings of SDL. They demonstrate how value is a dynamic, interactive, and co-created entity, how resources enable and facilitate this process, and how the active participation of all actors is vital in shaping the service-dominant economy. Together, these premises offer a holistic perspective on the evolving landscape of value creation and exchange in contemporary commerce.

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1.4 MARKET VISION OF SERVICE-DOMINANT LOGIC

For Vargo et al. (2008) in the GDL view, the object of economic exchange is to create and deliver objects to be sold; consequently, the value is incorporated into a good during the firm's production process, and the value is determined by the market price or what the customer is willing to pay. Maximum efficiency and profit are achieved from this perspective through standardization and economies of scale.

Vargo et al. (2006, p. 40) argue the SDL views all exchange as based on service and that "when goods are involved, they are tools for the delivery and application of resources". Looking at the FP1 and FP3, the goods and services are combined in the SDL with the propositions as a distribution mechanism under the term "service provisions" and the service is changed base. For Vargo et al. (2008) this means that goods are service delivery vehicles.

Vargo and Lusch (2004a) explain that, for SDL, value comes from the favorable use of operant resources, which are occasionally transmitted through operand resources or goods. Looking from another perspective, the operand resources are resources on which an application or act is performed to produce an effect and operant resources are employed to act on operand resources.

According to Jonhson et al. (2005), the main resources to gain competitive advantage are knowledge and skills, as they are important in environments where ambiguity or decisions are complex and this will make a difference when people are having consumer experience. For Grönroos (2012), in the SDL context, the knowledge, skills and insight are required to accomplish the tasks for the service to be performed and for the existence of motivation.

And the same sense Vargo and Akaka (2009) argue in the context of SDL, the operant resources, defined in the FP4, such as knowledge and skills are the sources of value and value creating resources, but are not only confined to the firm. Central to the idea of SDL is the concept of resource integration as a key mechanism for value co-creation. If individual firms do not have adequate resources to create value, they need "a network-within-network conceptualization of relationships that converge on value creation through a web of resource integration" (Vargo & Akaka, 2009, p. 38).

Thus, customers, suppliers and other stakeholders are also operant resources and contribute to value creation. In this view, resource integration is therefore a multidirectional network-oriented process (Lusch et al., 2008) with parties integrating 'multiple resources for their own benefit and for the benefit of others' (Vargo & Lusch, 2008b). And complementary, Vargo et al. (2008) argued the value is co-created by the mutual effort of firms, personnel, clients, stakeholders, government agencies, and other entities connected to any given exchange, but is always decided by the customers and users of any platform.

Thus, for Vargo and Lusch (2008b), the SDL states that value is always co-created with the customer. For Gummesson and Mele (2010), SDL addresses the customer's role in terms of an operant resource that plays an active role in the value creation process and moves away from the traditional idea that a supplier is a value creator and a customer is a passive receiver to a conceptualization of customers and suppliers as value co-creators. In this sense, they argued exist two active parties that collaboratively and jointly create mutual value by interacting and integrating resources.

According FP6 and FP10, the customer is the co-creator of the service and only him/her can determine the value. In other words, they recognize that the customer is the co-creator of the service and is the one who ultimately determines the value. This highlights the importance of understanding and responding to customer needs and preferences in order to deliver value. In addition, FP10 suggests that "value is always uniquely and phenomenological determined

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by the beneficiary", this means that each individual has a different experience with the service being exchanged and values it differently (Vargo & Lusch, 2008a, 2008b).

But the FP11 make one restriction, the value co-creation is coordinated through actor-generated institutions and institutional arrangements, emphasizing the role of actor-generated institutions and institutional arrangements in coordinating the co-creation process. This acknowledges that value co-creation is not simply a matter of individual actors working together, but rather requires a larger institutional framework to facilitate and coordinate the process.

Furthermore, the setting of the usage is essential to determine value. The context involves actors that are part of the experience and the other resources that are drawn upon in the usage experience (Maglio et al., 2009; Vargo & Akaka, 2009; Vargo & Pels, 2009). This concept is rooted in SDL, which emphasizes the importance of understanding the broader ecosystem in which value is co-created. According to this approach, the service experience involves not just the interaction between the customer and the service provider, but also the other resources that are drawn upon in the usage experience. Not only the customer is active, all social and economic actors are resource integrator (FP9), and they can participate in the creation and offering of value propositions (FP7).

Thus, SDL also expands the traditional supplier-customer dyad to include other stakeholders in the service ecosystem, such as other customers, intermediaries, and even competitors. SDL provides a more dynamic and collaborative approach to value creation, in which customers and suppliers work together within a larger service ecosystem to co-create value that benefits all stakeholders. By going beyond the supplier customer dyad and applying a network and a systems perspective, SDL describes a service ecosystem in which numerous stakeholders contribute to value, and expect value in return (Vargo & Lusch, 2011). The value creation in SDL is an interactive process between all entities. It must be considered in a relational context. This system's perspective recognizes that value is co-created through a complex network of relationships among various actors.

Thus, these resources can include other actors such as family members, friends, or colleagues who are part of the customer's social network, as well as physical resources such as technology, infrastructure, and facilities that are part of the broader context. This perspective emphasizes the collaborative, systemic nature of value creation, and highlights the need for a more inclusive and holistic approach to marketing theory and practice. By considering these resources and actors, service providers can gain a more holistic understanding of the customer's needs and preferences and deliver a more personalized and valuable service experience.

SDL incentivizes all actors in a service ecosystem to play a role in value co-creation. This means that traditional B2B, C2C, and B2C relationships are transformed into all-to-all (A2A) relationships, where all actors are interconnected and interdependent. The concept of A2A relationships emphasizes that value is created through the interactions and collaborations between all actors in a service ecosystem. For example, a customer may co-create value with a service provider by providing feedback on a new product or service, or by participating in a beta test. A service provider may co-create value with other service providers by partnering on joint ventures or by sharing resources.

Additionally, the A2A relationships are coordinated through actor-generated institutions and institutional arrangements. These institutions and arrangements provide a framework for collaboration and value co-creation. (FP11). These institutions and arrangements can include formal organizations such as industry associations and standards bodies, as well as informal networks and communities of practice. By working together within these frameworks, actors

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in a service ecosystem can create a more coordinated and effective approach to value co-creation.

Vargo and Lusch (2011, p. 182) argue "all actors are fundamentally doing the same things, co-creating value through resource integration and service provision, turning possible normalize for have a better vision of the collaborative, systemic nature of value creation and the implications for marketing theory and practice", but coordinated through actor-generated institutions and institutional arrangements (FP11). Through these institutions and arrangements, actors in a service ecosystem can establish common goals and objectives, develop shared norms and values, and create mechanisms for governance and decision-making. This helps to ensure that value co-creation is effective and sustainable over the long term.

According to this view, value creation is not a zero-sum game, where one party gains at the expense of another. Rather, it is a collaborative process that involves the integration of resources and capabilities from multiple actors to create value that is greater than the sum of its parts. In this context, marketing is not just the responsibility of a single actor, but rather a shared responsibility of all actors in a service ecosystem (Akaka et al., 2012; Vargo et al., 2020). This requires a shift in thinking from a transactional, exchange-based view of marketing to a more collaborative and relational view that emphasizes the ongoing co-creation of value. This means that the focus of marketing shifts from simply exchanging products or services for money, to building and maintaining relationships with customers and other actors in the ecosystem. By doing so, firms can gain a deeper understanding of their customers' needs and preferences and can work collaboratively with them to co-create value that meets those needs.

In this view, marketing is no longer just a set of tactics or strategies aimed at promoting products or services, but rather a continuous process of building and maintaining relationships that support ongoing value creation. This requires a fundamental shift in thinking and approach, from a focus on the firm's own products and services, to a focus on the broader ecosystem and the resources and actors that are part of it. The shift towards a collaborative and relational view of marketing is an important part of the broader perspective on value co-creation, and highlights the importance of ongoing, long-term relationships in creating value for all actors in a service ecosystem (Wang et al., 2019).

This perspective enables firms to focus on the needs and desires of their customers, rather than simply producing goods or services and hoping that customers will buy them. By actively engaging with customers and other stakeholders in the service ecosystem, firms can identify areas for improvement and co-create value that is better aligned with the needs and preferences of their customers; hence, firms can develop innovative products and services that meet the evolving needs of the market. By adopting this perspective, SDL enables firms to better understand and leverage the resources and capabilities of their customers and other stakeholders, leading to more effective and efficient value creation processes. Furthermore, by focusing on creating value for all stakeholders in the service ecosystem, firms can create a competitive advantage that leads to increased customer demand, higher prices, and a larger market share, all of which can contribute to increased revenue and profitability for the firm.

Moreover, when customers feel that they are active participants in the value creation process and that their needs and preferences are being considered, they are more likely to be satisfied with the products or services provided. This can lead to increased loyalty and retention, as well as positive word-of-mouth recommendations to others.

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Overall, adopting SDL can help firms to improve their relationships with customers and other stakeholders, create innovative value propositions, and achieve sustained competitive advantage in the marketplace.

1.5 Implications of Service-Dominant Logic for management

The GDL perspective focuses on creating value through products and services that are developed and delivered by the firm. In contrast, the SDL perspective emphasizes the importance of co-creating value with customers, by involving them in the design, delivery, and even marketing of services.

Firms that are used to a GDL perspective may need to reevaluate their assumptions about value creation, customer roles, resource focus, exchange, and innovation (Michel et al., 2008). They may need to adopt new strategies, processes, and tools in order to effectively co-create value with their customers, involve stakeholders in the service ecosystem, and foster a culture of innovation and experimentation.

This requires a shift in the way that firms view their customers, from passive recipients of value to active co-creators of value. In terms of exchange, the GDL perspective sees it as a transactional process, while the SDL perspective sees it as a collaborative process of co-creating value (Lacoste, 2016). This requires a broader focus on the resources and capabilities of all stakeholders in the service ecosystem, rather than just those of the firm itself, and highlights the importance of building strong relationships with customers and other stakeholders, and of actively seeking feedback and input throughout the service delivery process.

Firms may need to invest in new technologies that enable them to gather customer feedback and insights in real-time, or to collaborate more effectively with other stakeholders in the service ecosystem. They may also need to rethink their organizational structure and culture, to better support a customer-centric approach to value creation and service delivery.

The emphasis on service innovation and the co-creation of value in the SDL perspective highlights the need for firms to continuously adapt and evolve in response to changing customer needs and preferences (Payne et al., 2021). This requires a culture of innovation and a willingness to experiment and take risks to stay ahead of the competition.

The key differences between the GDL and SDL perspectives represent a significant challenge for firms seeking to transition to a customer-centric approach to business (Harrington et al., 2019; Michel et al., 2008). However, those that can successfully make this transition are likely to be better positioned to compete in a rapidly changing marketplace and to build long-term relationships with their customers. While the shift towards a customer-centric approach can be challenging, firms that are able to successfully make this transition are likely to reap significant rewards.

To implement the SDL, Vargo and Lusch (2008a) suggest some transitional shift. These transitional shifts are intended to help firms adopt a more customer-centric and collaborative approach to value creation, which is central to the SDL. The shifts are as follows:

1. The first shift is from thinking of the purpose of firm activity as making something (goods or services) to a process of assisting customers in their own value-creation processes. This shift involves recognizing that customers are active participants in the creation of value and that firms should aim to facilitate and support this process.
2. The second shift is from thinking of value as something produced and sold to thinking of value as something co-created with the customer and other value-creation partners. This shift involves recognizing that value is not something that is

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created solely by the firm, but rather is co-created through interactions between the firm, the customer, and other stakeholders.

3. The third shift is from thinking of customers as isolated entities to understanding them in the context of their own networks. This shift involves recognizing that customers are not isolated individuals, but rather are embedded in social and cultural networks that shape their behavior and preference.
4. The fourth shift is from thinking of firm resources primarily as operand - tangible resources such as natural resources - to operant - usually intangible resources such as knowledge and skills. This shift involves recognizing that the primary sources of value in service-dominant systems are often intangible resources such as knowledge and skills, rather than physical assets.
5. The fifth shift is from thinking of customers as targets to thinking of customers as resources. This shift involves recognizing that customers are not just passive recipients of value, but rather are active participants who contribute their own resources, such as time, knowledge, and expertise, to the value-creation process.
6. The sixth shift is from making efficiency primary to increasing efficiency through effectiveness. This shift involves recognizing that the goal of service-dominant systems is not just to maximize efficiency, but rather to achieve effectiveness by creating value for all stakeholders involved in the value-creation process.

Additionally, Vargo and Lusch (2008a) suggest changes in the way firms view their offerings and interact with customers, as well as changes in the way they collaborate with other firms in their networks. These transitional shifts are intended to help firms better understand the nature of value creation in a service-dominant economy and to adopt new practices and ways of thinking that are better suited to this environment. The shifts are as follows:

1. From GDL to SDL: This shift involves moving away from the traditional focus on tangible goods and towards a focus on intangible services. Firms should view their offerings not as products but as services that help customers achieve their desired outcomes.
2. From a focus on transactions to a focus on relationships: This shift involves moving away from a focus on one-off transactions and towards a focus on building long-term relationships with customers. Firms should seek to create value for customers over the long term, rather than just in a single transaction.
3. From a firm-centric view to a customer-centric view: This shift involves moving away from a view of the firm as the center of the value-creation process and towards a view of the customer as the center. Firms should seek to understand the needs and preferences of their customers and work to co-create value with them.
4. From a value chain to a value network: This shift involves moving away from a linear view of the value-creation process and towards a more networked view. Firms should work collaboratively with other firms in their networks to create value for customers.
5. From a focus on efficiency to a focus on effectiveness: This shift involves moving away from a focus on internal efficiency and towards a focus on creating value for customers. Firms should prioritize effectiveness over efficiency, seeking to create value for customers in the most effective way possible.

The revolution that has been taking place over time, in which services are the basis for firms to do business, has had a significant impact on the various layers of society. Grönroos (2008b, p. 303) state that “the costumers are not primarily interested in what they buy and consume, but in what they can do with what when they have in their possession”. They use resources in

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self-service processes to get something out if it. In other words, they use resources to get something of value for themselves. This implies that firms must be open-minded to receive suggestions that can help them improve their performance, products and services. Thus, the requirements that are increasingly imposed on firms and the economy have led to the workforce and knowledge also being acquired outside its walls, that is, in the interactions of firms with their research partners, customers, suppliers and others who can somehow contribute with valid and workable ideas (Kleinaltenkamp et al., 2022; Romijn & Albaladejo, 2000).

To create an environment of participation by customer with the firms, Karpen et al. (2012) argued the firms need to establish new capabilities and structures in order to interact with their customers. This is because customer participation involves more than just providing feedback or completing surveys; it requires a deeper level of engagement and collaboration between the firm and the customer (Cui & Wu, 2016; Gangale et al., 2013). To enable this level of participation, the authors suggest that firms need to develop a range of capabilities, including:

- Collaboration capabilities - Firms need to develop processes and technologies that enable effective collaboration between customers and the firm.
- Co-creation capabilities - Firms need to develop the ability to co-create value with customers, working together to develop new products and services.
- Customer intelligence capabilities - Firms need to develop the ability to gather and analyze customer data to better understand their needs and preferences.
- Customer relationship management capabilities - Firms need to develop the ability to manage customer relationships effectively, building trust and rapport with customers over time.

In addition to these capabilities, the authors argue that firms also need to establish new structures to support customer participation, such as cross-functional teams, customer councils, and customer-facing roles within the organization. The authors emphasize the importance of creating an environment that fosters customer participation, and the need for firms to develop the capabilities and structures required to support this.

Koskela-Huotari et al. (2016), on the other hand, argued on the relevance of the managers role as important catalyst for change in value co-creation practices among actors. The proactive management is critical to enabling and facilitating changes in value co-creation practices in service ecosystems. The ability of managers to redefine roles, make and break rules, and reframe resources is critical to enabling and facilitating value co-creation practices that are more collaborative and inclusive.

Managers must be able to enable and facilitate changes in the institutionalized rules of resource integration that govern interactions among actors in the ecosystem. To do this, managers may need to redefine the roles of actors, and to make and break rules that support more collaborative and inclusive practices (Bohman et al., 2020). This may involve reframing resources in new ways, and identifying new opportunities for value co-creation that may not have been apparent before. Managers may also need to create new institutional arrangements that allow for more open and transparent communication and collaboration among actors. They may also need to provide training and support to actors to help them develop the skills and knowledge necessary to engage in more collaborative value co-creation practices. By doing so, managers can help to create more effective and sustainable service ecosystems that deliver value to all actors involved and are better able to adapt to changing circumstances and evolving customer needs.

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Finally, for the transition to be effective, Skålén and Edvardsson (2015, pp. 13-15) suggests a framework with the steps that firms undergo when want transform from a GDL to a SDL. The framework includes the following steps:

- Awareness - the first step involves becoming aware of the need for change and the benefits of adopting an SDL perspective. This may involve educating employees and other stakeholders about the principles of SDL and the changes that will be required.
- Understanding - the next step involves developing a deeper understanding of the value co-creation process and the role of customers and other stakeholders in this process. This may involve conducting research and gathering feedback from customers and other stakeholders.
- Commitment - the third step involves committing to the transformation process and developing a shared vision and values that support the adoption of an SDL mindset. This may involve aligning organizational structures, policies, and incentives with the new vision and values.
- Capability development - the fourth step involves developing new skills, capabilities, and processes that support the co-creation of value with customers and other stakeholders. This may involve investing in employee training, developing new tools and techniques for value co-creation, and redefining roles and responsibilities within the organization.
- Implementation - the final step involves implementing the changes and continuously monitoring and evaluating the effectiveness of the new practices and processes. This may involve establishing new metrics and performance indicators that reflect the co-creation of value and rewarding employees for their contributions to this process.

Overall, the framework emphasizes the need for a systematic and intentional approach to the transition from GDL to SDL, with a focus on developing new skills and capabilities, aligning organizational structures and incentives, and creating a culture of customer-centricity and value co-creation. This involves a fundamental shift in the way firms view value creation and their relationship with customers and other stakeholders. In an SDL mindset, value is created through interactions between customers and firms, rather than simply through the transfer of goods and services.

Achieving this transformation necessitates a profound comprehension of the customer's evolving needs and preferences, underpinned by a genuine commitment to engaging with customers in a meaningful and mutually beneficial manner. It signifies a strategic shift towards cultivating enduring relationships with customers, rather than solely prioritizing short-term, transactional interactions. This enduring commitment entails an unwavering dedication to continuous learning and development, as well as a readiness to explore innovative approaches to co-create value.

Adapting to this customer-centric perspective also demands a proactive effort to remain at the forefront of industry trends and emerging technologies. Staying up-to-date with the latest developments and being receptive to fresh ideas and diverse viewpoints are essential components of this adaptive journey. Furthermore, it involves fostering a culture that champions collaboration and innovation, empowering employees to contribute their unique skills and perspectives to the co-creation of value.

This holistic transformation process is encapsulated in Table 7, offering a thorough breakdown of each step. The framework meticulously delineates the foundational significance of each step, elucidates how it initiates a transformative shift in the execution of value

creation practices, and intricately details the metamorphosis of employees' mindsets and behaviors. This strategic evolution, firmly anchored in a customer-centric ethos, goes beyond merely augmenting an organization's capacity to co-create value. It serves as a powerful catalyst propelling the organization towards sustained success in the dynamically evolving landscape of modern commerce. Embracing this holistic approach not only positions organizations as agile and innovative entities but also fosters a culture of continuous improvement and adaptability essential for navigating the complexities of today's business environment.

Table 7. Framework of transformation from a GDL to an SDL

Steps	Basic Nature	Value Creation practices	Transformation of mindset	Transformation of behavior
Problematization of GDL	External market pressures, such as increased competition and normative pressure, suggest that Good-Dominant logic-promoting value creation practices are inappropriate. External pressure drives leaders to strategically change the firm.	The enactment of institutionalized Good-Dominant logic promoting value creation practices supports the understanding that value is produced and embedded in offerings in isolation from customers.	Employees understand value as produced internally, and they are focused on delivering products and services in accordance with internal predefined standards as efficiently as possible.	The dominant and expected behaviors at the firm are directed toward the production of value intraorganization ally. Employees are reactive in relation to customers.
Introduction of SDL - promoting value creation practices	Broad frameworks based on values and practices that underpin the Service-Dominant logic are introduced to strategically transform the firm from a Good-Dominant to a Service-Dominant logic.	SDL promoting value creation practices are introduced into or developed within the firm, but these are still premature and do not affect the firm as a whole.	The employees are reenvisioned as customer value facilitators, as a key operant resource. However, the employees have not yet fully accepted this position.	The ground has been prepared for a way of working and doing business aimed at supporting the facilitation of the customer's co-creation of value, but the change is yet to materialize.
Contextualizing the SDL	The specific transformation that the firm needs to conduct to transform from a Good-Dominant to a Service-Dominant logic becomes	Value creation practices that may accomplish the firm-specific transformation from a Good-Dominant to a Service-Dominant logic are	The precise type of employee, which a particular firm needs to have in order to realize the transformation from a Good-Dominant to a Service-Dominant logic, is identified.	The majority of employees enacts and starts act according to Service-Dominant logic promoting value creation practices. Servant

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Steps	Basic Nature	Value Creation practices	Transformation of mindset	Transformation of behavior
	clear.	imported into and / or developed within the firm		leadership assists this process.
Establishing an SDL firm	The understanding that value is co-created with customers, based on operant resources, subjectively determined by customers and realized in use by customers, dominates the firm.	The enactment of Service-Dominant logic promoting value creation practices dominates organizational practice.	The absolute majority of firm employees see it as natural to engage in co-creation processes with customers.	Facilitating the co-creation of value is the dominant type of leadership and employee behavior at the focal firm.
Reproduction of the SDL	The firm is deeply embedded in the Service-Dominant logic.	The enactment of Service-Dominant logic promoting practices is deeply institutionalized within the firm and directs its main work processes.	All employees continuously enact Service-Dominant logic promoting practices and learn new ways of co-creating value, which reproduces their Service-Dominant Logic based professional identity.	Employees co-create value with customers. Managers use servant leadership practices to manage the employees.

Source: Own elaboration based on Skålén and Edvardsson (2015, pp. 14-15)

The framework posits that the transformation process should center on the adoption of value creation practices that leverage the knowledge and skills of both employees and customers. This approach not only promotes a more inclusive and collaborative value co-creation environment but also calls for the promotion of servant leadership as a driving force for change in professional identities. It underscores the vital role of leadership in nurturing a culture of service excellence and innovation within organizations.

Additionally, the framework places a significant emphasis on two critical pillars of this transformation journey. First, it stresses the importance of service quality measurement and relationship marketing as shared foundations for understanding the imperative need for transformation. By gauging service quality and fostering strong customer relationships, organizations can effectively identify areas for improvement and innovation. Secondly, it underscores the role of coaching in altering employees' professional identities, aligning them with the organization's evolving values and customer-centric focus.

The framework recommends the identification and cultivation of institutional entrepreneurs. These individuals, adept in the practice of servant leadership, are poised to champion the transformation process and act as catalysts for change. They play a pivotal role

in aligning the organization with the customer-centric ethos and leading the charge towards a more service-oriented, value-co-creating culture.

This comprehensive framework offers an invaluable starting point for firms seeking to transition towards a customer-centric business model. It underscores the critical importance of soliciting and incorporating customer input while harnessing the collective knowledge and skills of employees in the co-creation of value. By embracing these principles and facilitating the shift in professional identities, organizations can position themselves as dynamic, customer-focused entities ready to thrive in the evolving landscape of modern commerce.

The firms need create strategies to the customer feel an environment that encourage sharing knowledge and information relevant, diversify their skills, reinforce autonomy, risk taking and flexibility on which adaptation (Heinonen, 2011). At the same time, the firms need prepare employees to communicate with the customer, receive judgment, explore the curiosity, and detect an innovation, encourage the interactions, work with passion and honesty with the firm and the customers (Ind et al., 2019). Additionally, firms with a flexible structure can increase their service flexibility and adaptability to customer needs, which can lead to more intense interactions and stronger customer loyalty (Zahra et al., 2008). Additionally, by promoting a culture of openness, collaboration, and continuous learning, firms can create an environment that encourages knowledge sharing, skill diversification, and risk-taking, all of which are essential for adapting to changing market conditions and customer needs.

Harnessing these strategic approaches empowers organizations to construct a service delivery model characterized by heightened flexibility and adaptability, catalyzing the cultivation of robust, enduring customer relationships and, consequently, steering the trajectory toward sustained long-term success. This transformative journey hinges on the pivotal principles of cherishing customer input, harnessing the wealth of knowledge and competencies within the workforce, and fostering a corporate culture steeped in innovation and adaptability.

When businesses wholeheartedly embrace these tenets, they architect a paradigm shift, placing the customer at the nucleus of their operational ethos. This recalibration is instrumental in forging a resounding customer-centric approach to business, one that not only fuels the engine of success but propels continuous growth. It revolves around the recognition that the linchpin for flourishing in the contemporary, rapidly shifting business landscape lies in an unwavering commitment to the customer's unique needs and preferences.

This multifaceted customer-centric approach pivots on a trinity of attributes: innovation, collaboration, and adaptability. Embracing innovation ensures that businesses remain at the vanguard of transformative trends and technologies, consistently innovating to address the ever-evolving customer landscape. Collaboration is the cornerstone that strengthens the interconnected relationships between all stakeholders, infusing the value co-creation process with a sense of collective ownership and synergy. Adaptability, in turn, ensures that organizations are primed to pivot, evolve, and respond agilely to changes and challenges.

1.6 VALUE CO-CREATION IN SERVICE-DOMINANT LOGIC

Creating value is the essence of any firm and costumer relationship. However, understanding where the real value lies can sometimes be an abstract concept. The key to creating value for both the firm and the customer is to identify the potential to serve at the very beginning of the service. Building a customer value proposition is an excellent opportunity to increase sales and grow long-term opportunities for new business. To do so, it is essential to understand what the customer needs, wants, and values. This requires a deep understanding of the customer's pain points, desires, and expectations. Once a business has identified what its

customers value, it can begin to tailor its products and services to meet those needs. This will not only improve the customer experience but also increase the value of the business's products and services.

To create value for both the firm and the customer, it is essential to focus on the long-term relationship between the two parties. This means that the firm must be willing to invest in building relationships with customers and providing high-quality products and services that meet their needs. In turn, customers will be more likely to remain loyal and recommend the firm to others, creating a cycle of value creation that benefits both parties.

According to the traditional GDL, value is created by the manufacturer of the goods which is then exchanged with the customers for goods or money (Lusch & Vargo, 2006; Lusch et al., 2006; Vargo & Lusch, 2004a, 2006). Thus, this view of value is entirely based on the value-in-exchange meaning of value, which emphasizes the transactional aspect of value creation (Vargo & Lusch, 2004a, 2004b; Vargo & Morgan, 2005) and the process of value creation was entirely an activity performed by the firm, and the customer is seen as a passive recipient of value (Vargo et al., 2008). This perspective is being challenged by the emerging SDL, which emphasizes the co-creation of value between the firm and the customer.

The SDL provides a more dynamic and customer-centric view of value creation that recognizes the importance of co-creation. The SDL propose the value is not only created by the firms, but it is co-created by producers and customers jointly (Lusch & Vargo, 2006; Lusch et al., 2006; Vargo & Lusch, 2004a). Vargo and Lusch (2016) propose the value is co-created by multiple actors, including the beneficiary, who cannot deliver value but can participate in the creation.

The concept of value co-creation articulates the idea that value is created through interaction and mutually beneficial relationships, within and among service systems, as they integrate and apply resources for and with each other and exchange service for service (Vargo & Akaka, 2012). The customer brings their own resources, knowledge, and capabilities to the interaction, which is combined with the firm's resources, knowledge, and capabilities to co-create value. Thus, value is not seen as something that is created by the firm and transferred to the customer, but rather as something that is co-created by multiple actors who participate in the value creation process.

According Vargo and Akaka (2012), value co-creation is a process that involves the integration and collaboration of resources, skills, knowledge, and capabilities from both the firm and the customer. According to the SDL, the customer is not just a passive recipient of value but an active participant in the value creation process (Ekman et al., 2016). The customer is not seen as a mere value-recipient, but a value co-creator like an operant resource that is able to act on other resources and themselves can extract value from the service (Kuzgun and Asugman (2015). It is not just a simple exchange of goods or services, but a dynamic process where both parties contribute to the value creation process. By articulating what knowledge, skills, and capabilities their customers require, and providing opportunities for customers to acquire them, service organizations can better facilitate customer involvement in the service production process and co-create value with their customers.

Vargo and Lusch (2008b) suggests that value does not exist until an offering is used, as the experience and perception of the beneficiary are essential to value determination. This view shifted the traditional focus of value-in-exchange to value-in-use meaning of value, where value was co-created through the interaction of resources between customers and the firm or firm’s resources (Vargo et al., 2008). The focus now is on the value-in-use meaning of value, which emphasizes the experiential aspect of value creation. The focus is on the benefits that the customer derives from using the firm's products or services, rather than just the

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exchange of goods or money. Thus, the SDL also recognizes that the value of a product or service is not just based on its functional characteristics but also on the emotional, social, and psychological benefits that it provides to the customer (Grönroos & Voima, 2013). Therefore, the SDL emphasizes the importance of understanding the customer's experience and creating products and services that provide a positive experience for the customer.

The value-in-use also represents a shifting role for the customer, from a passive receiver of delivered value to an active value creator (Grönroos, 2008b; Lovelock & Young, 1979; Normann & Ramírez, 1993; Wikstrom, 1996). Value-in-use refers to the value that is created by the customer through their use of a product or service. It recognizes that the value of a product or service is not inherent in the offering itself but is dependent on how it is used by the customer and the context in which it is used. It emphasizes the importance of a customer-centric approach to value creation, where the firm works in collaboration with the customer to co-create value. With that, the firms can only propose value and can participate co-ordinate the experience. The value creation is not more outside of the functions of the firms, but they need be an actives element and the value-in-use can evolve positively as well as negatively over time throughout the customer's value-creating process (Grönroos, 2011; Grönroos & Gummerus, 2014; Grönroos & Voima, 2013; Normann & Ramírez, 1993). The customer's value-creating process consists of the joint customer-provider sphere and the customer's sphere (Grönroos & Voima, 2013; Normann & Ramírez, 1993).

The joint customer-provider sphere refers to the collaborative and interactive space where the customer and the provider work together to co-create value. In this sphere, the customer and the provider exchange resources, knowledge, and information to co-create value, and they adapt to each other's needs and preferences. The joint customer-provider sphere is an essential component of the value creation process, as it emphasizes the importance of collaboration and interaction between the customer and the provider.

The customer's sphere refers to the space where the customer creates value on their own. In this sphere, the customer uses the provider's offering and combines it with their own resources and knowledge to create value. This includes the customer's needs, preferences, and behaviors that impact the value they derive from the product or service. The customer's sphere is an essential component of the value creation process, as it emphasizes the importance of the customer's active role in creating value.

The joint customer-provider sphere and the customer's sphere are both critical components of the customer's value-creating process. They recognize the importance of collaboration and co-creation between the customer and the provider in delivering value. In addition to the joint customer-provider sphere and the customer sphere, the provider also has a sphere in which the provider facilitates the co-creation of value-in-use by developing and compiling the resources needed to support customers' everyday lives (Grönroos & Gummerus, 2014). Together, these three value spheres constitute the total value generation process that ultimately leads to value for the customer (Grönroos & Gummerus, 2014). Value creation not only depends on the activities of firms, but it was always co-created with all intervenient the process of experience creation. That implies the combined efforts of customers, employees, and the firm, but the value derived is always determined by the beneficiary party, normally, the customers (Vargo et al., 2008).

So, the value-in-use is either co-created in the joint customer-firm sphere or independently created by the customer in the customer sphere (Grönroos & Voima, 2013; Sridhar, 1998). Co-creation of value-in-use takes place during direct interaction between the customer and firm. Independent creation of value-in-use, on the other hand, takes place when

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the customer interacts with nonintelligent resources from the firm but not with the firm directly (Grönroos & Gummerus, 2014).

Thus, in opinion of Grönroos (2012, p. 1522), the value-formation process includes three distinct sub-processes, which highlight the importance of collaboration and interaction between the firm and the customer in creating value:

1. the firms act alone and facilitates the customer's creation of value-in-uses - in this case, the firm provides the customer with a product or service that the customer can then use to create value in their own unique way - the firm's role is to provide the necessary resources and support to enable the customer to derive value from the product or service.
2. the customer acts alone by integrating available resources in a process this is closed to the firm (Grönroos & Ravald, 2011), thus experience the resources and creation value-in-use for him- or herself - in this case, the customer takes on the primary role in creating value and may use a variety of resources, including those provided by the firm, to do so - the firm may not necessarily be directly involved in this process.
3. the firm and the customer acts together in a merges, coordinated, dialogical and interactive process that creates value for the customer, and for the firm as well – using the strictly analytical meaning of the expression, they co-create value (Grönroos, 2011) - this is often referred to as co-creation, where the firm and the customer work together to create a unique and valuable experience - in this sub-process, both the firm and the customer are active participants, with each contributing their own resources and expertise to the value-creation process.

On the other hand, for Kuzgun and Asugman (2015, p. 249), value is propose on three main dimensions:

1. Multi-actor interactions – first to the dyadic relationships, between the firm and the customer, and between the customer and the customer, and to the triadic and complex networks such as the many-to-many networks - referring to the various relationships between actors involved in the value co-creation process, including dyadic relationships between the firm and the customer, and between customers, as well as more complex networks such as many-to-many interactions.
2. Service value co-creation – the value is not created by one actor and delivered to the other, but it is co-created through the interactions of all the actors involved - the value co-creation process through these interactions involves value proposed by the firm, value created by the customer, value derived from customer-customer interactions, and value derived from many-to-many interactions - emphasizing that value is not solely created by one actor and delivered to another, but rather it is co-created through the interactions of all actors involved. This includes the value proposed by the firm, value created by the customer, value derived from customer-customer interactions, and value derived from many-to-many interactions.
3. Long term relational attributes dimension – the value does not occur at a single point in time as it is in exchange view, but it occurs through the length of the relationships between the actors - recognizing that value does not occur at a single point in time, as in the exchange view, but rather it occurs through the duration of the relationships between the actors involved. This dimension highlights the importance of fostering and maintaining long-term relationships to continue co-creating value over time.

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All this highlights that customers like co-creators of value have an important role, they are actives elements creating their service experience and help the firms develop a competitive advantage element (Grönroos, 2011; Grönroos & Ravald, 2011; Prahalad & Ramaswamy, 2004b; Vargo & Lusch, 2004a). In this important role, the consumers unlock the suppose value embedded by the firm in the service or anything else, but only they can determine the real value.

Value creation can thus be simply understood as a process through which when consumers use something and they tend to become better than they were before by using that service or when the service the user uses increases their wellbeing (Grönroos, 2008a, 2011; Vargo & Lusch, 2008b). In this view, value is not simply a product or service that is exchanged for money. Instead, it is the outcome of a dynamic process of co-creation, in which the customer and the firm collaborate to create a mutually beneficial outcome. By using a product or service, the customer gains some benefit or improves their well-being, and in doing so, they contribute to the creation of value. Customers make purchasing decisions based on their perceived value, which is influenced by a variety of factors such as price, quality, convenience, brand reputation, and customer service. If customers do not perceive sufficient value in a product or service, they are unlikely to make a purchase or become repeat customers. The only reason why the customers will ever "buy" something from one or more firms is because they perceived the value when they use what they "buy". Thus, value can be defined as the benefits or satisfaction that customers derive from using a product or service, relative to the costs or sacrifices that they must make to acquire it.

Therefore, firms must focus on creating and delivering value to their customers in order to succeed in the marketplace. Psychological and social factors also play an important role in customer perception of value (Yu & Lee, 2019). For example, customers may perceive value in a product or service based on its ability to enhance their self-image or social status. Additionally, customers may value the experience of using a product or service, such as the feeling of enjoyment or satisfaction that they get from using it. Therefore, firms must focus not only on delivering functional benefits, but also on creating positive emotional experiences for their customers (Kim & Sullivan, 2019; Tyrväinen et al., 2020).

In summary, the SDL as a new unifying theory of marketing thought (Lamberti & Paladino, 2013) came to emphasize the role played by customers on participation with the firms and presents them as active elements (Grönroos, 2011; Grönroos & Ravald, 2011; Prahalad & Ramaswamy, 2004b; Vargo & Lusch, 2004a, 2008b).

In the SDL, value is seen as a dynamic and context-specific concept that is co-created by the customer and the firm through the usage process. The best way to understand value co-creation is to recognize everyone is a co-creator of value, because everyone in using a service is co-creating their perception of value. If firms can understand the perceptions created by their customers, they can gain insights and take actions that foster more value creation. To do this, firms need to develop strategies to understand customers and the processes for value formation to happen. But firms need to understand that they are also customers of their own suppliers; this implies that they are also co-creators of value.

Finally, value co-creation is not only about customers and firms, but it can also involve other stakeholders such as suppliers, partners, and employees. Each stakeholder plays a crucial role in the value creation process, and their perceptions of value can influence the outcome. By recognizing everyone as a co-creator of value, firms can develop a more comprehensive understanding of the value creation process and identify opportunities to enhance it (Hosseini et al., 2022). Moreover, by involving different stakeholders in the co

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creation process, firms can foster stronger relationships and build a network of partners that share a common goal of creating value for customers.

1.7 TOOLS AND APPROACHES TO FACILITATE CO-CREATION IN SERVICE-DOMINANT LOGIC

In the business context, co-creation should be seen as an important aid as a fundamental tool for firms, since this way they can develop and promote their products and services through the surrounding internal and external inventive communities (Fernandes & Remelhe, 2016).

However, creating value for customers is a complex and multifaceted process that involves a deep understanding of customers' needs and preferences, as well as an ability to deliver high-quality products and services that meet those needs.

The perception of value and value proposition for the co-creation must be focused on something for the customers can understand, perceive benefits, opportunities to sharing ideas and mechanism to follow-up the generated ideas. The firm needs to clearly communicate its value proposition and make it easy for customers to understand the benefits of participating in co-creation (Bone et al., 2014; Luo & Li, 2022; Malar et al., 2019).

Building strong relationships with customers also has a range of benefits. It can lead to increased customer satisfaction, trust, and loyalty. It can also help firms better understand customer needs and preferences, leading to improved product and service offerings. Additionally, strong customer relationships can provide a buffer against competition, as customers may be less likely to switch to a competitor if they have a strong emotional connection with a particular firm.

Moreover, the value proposition for co-creation should be aligned with the customers' needs and preferences and should provide them with a sense of empowerment and the ability to make a meaningful impact (Solakis, Katsoni, et al., 2022). Thus, the firm should provide customers with opportunities to share their ideas and feedback and establish mechanisms to follow up on the ideas generated through co-creation. This can help build trust and confidence among customers and create a sense of ownership and investment in the co-creation process.

In this line, (Mikalef et al., 2019) state that firms must focus on several key areas order to create value, including:

- Understanding customer needs - This involves conducting market research to understand the needs and preferences of customers, as well as monitoring customer feedback and reviews to identify areas for improvement.
- Developing high-quality products and services - Firms must develop products and services that meet the needs of their target audience and are of high quality. This may involve investing in research and development, as well as collaborating with customers to co-create new products and services.
- Delivering positive emotional experiences - In addition to functional benefits, customers also value positive emotional experiences such as enjoyment, satisfaction, and a sense of connection. Firms must focus on creating these emotional experiences for their customers by paying attention to factors such as design, aesthetics, and customer service.
- Building strong relationships with customers - Finally, firms must focus on building strong relationships with their customers by providing excellent customer service, offering personalized experiences, and creating loyalty programs that reward customer loyalty.

By focusing on these key areas, firms can create value for their customers and build strong, lasting relationships that drive long-term business success. Similarly, according to

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Timoshenko and Hauser (2019), Hussain et al. (2021), Cowling et al. (2018), Ind et al. (2017) and Laud and Karpen (2017), to have more success with the co-creation of value firms must:

- Identify customer needs and preferences: Firms need to identify the needs and preferences of their customers to create value that aligns with their interests and desires.
- Provide opportunities for customer participation: Firms need to provide customers with opportunities to participate in the value creation process, such as through online forums, focus groups, or other interactive channels.
- Provide support and resources: Firms need to provide the necessary resources and support for customers to participate effectively in the co-creation process, such as providing tools or training to help customers generate ideas.
- Evaluate customer input: Firms need to evaluate the ideas and feedback provided by customers to identify the most valuable insights and incorporate them into their product or service offerings.
- Communicate value: Firms need to effectively communicate the value that has been created to customers, highlighting the benefits and advantages that result from their participation in the co-creation process.

On the other hand, Ramaswamy and Gouillart (2010), state five basic underlying principles firms need to adhere to for successful co-creation. These principles help firms to establish a customer-centric culture that fosters collaboration, innovation-, and customer loyalty. By adhering to the following principles, firms can create value for both them and their customers, driving business growth and success (Simon et al., 2016):

1. Shared vision: Firms need to share a common vision with their customers regarding the purpose and goals of co-creation. This shared vision helps to align the interests of the firm and the customers and fosters collaboration and innovation.
2. Mutual respect: Firms need to treat their customers as partners in the co-creation process and show mutual respect for their ideas, contributions, and feedback. This approach helps to build trust and rapport with customers, which is essential for successful co-creation.
3. Open communication: Firms need to maintain open and transparent communication with their customers throughout the co-creation process. This approach helps to ensure that customers feel heard and valued and allows firms to incorporate their feedback into the development of new products and services.
4. Flexibility and adaptability: Firms need to be flexible and adaptable in their approach to co-creation, as customer needs and preferences may change over time. This approach helps to ensure that firms remain responsive to customer feedback and can adjust their co-creation strategies accordingly.
5. Continuous learning: Firms need to engage in continuous learning and improvement in their co-creation practices. This approach helps to identify areas for improvement and drives innovation and creativity in the co-creation process.

Thus, according to these propositions, and in line with Prahalad and Ramaswamy (2004b), firms must learn as much as possible about the customer interactions through rich dialogue. They suggest that as consumers become more sophisticated, they demand a higher level of engagement from firms and expect to be involved in the co-creation of value. To meet these expectations, firms must establish a continuous dialogue with their customers and actively seek their input and feedback (Kostis & Ritala, 2020; Prahalad & Ramaswamy, 2004a). In opinion of Grönroos (2012, p. 1528) “the interactions is only a platform for co-creation that

must be used by the parties in a way that influences the value formation process". Interactions between customers and firms are essential for co-creation of value (Zhang et al., 2020). These interactions provide a platform where customers and firms can learn from each other, share information and ideas, and create value together.

Interactions between customers and firms can help to increase service efficiency (Chang et al., 2014). Through these interactions, firms can gain feedback from customers on how to improve their services, which can lead to a more efficient service delivery process. Through this rich dialogue, firms can gain a deeper understanding of their customers' needs and preferences and use this information to develop new products and services that better meet their needs. They can also identify opportunities for innovation and co-creation of value, leading to more satisfied customers and increased competitiveness. Moreover, customers can also benefit from interactions by receiving personalized service and faster problem-solving. By using interactions correctly, firms can gain valuable insights into customer needs and preferences and provide better services, ultimately leading to customer satisfaction and loyalty (Chang et al., 2014; Xiao & Kumar, 2021). In summary, customer involvement in the service production process can help firms to create better services (Moghadamzadeh et al., 2020).

Moreover, when the customer feels his/her knowledge and demands are valid for the firm and result in the implementation in the new service or an existing service have an upgrade, this can provide a reinforcement of connection between both. By involving customers in the service production process, firms can also create a sense of ownership and engagement among customers.

Thus, understanding the customer's individual characteristics, needs, and preferences is essential for designing effective interventions that influence customer behavior and encourage value co-creation (Vernay et al., 2020). The firms need first understand how customers have experience for after to know how to delivery experiences (Lemon & Verhoef, 2016; Vakulenko et al., 2019a). Without this knowledge, it can be challenging to design interventions that resonate with customers and drive meaningful engagement. Therefore, firms must prioritize customer research and invest in tools and techniques that allow them to gather and analyze customer data effectively. However, the dialogue between firms and consumers should go beyond traditional market research methods and involve a more collaborative and interactive approach that allows customers to express their needs, preferences, and ideas.

Vega-Vazquez et al. (2013) argued the firms should consider that they must develop strategies that involve customer interaction. This means creating appropriate communication channels and promoting customer involvement in the service production process (Kurdi et al., 2022; Tien et al., 2019). This means that firms must design their services in a way that allows customers to participate in the process and co-create value. By creating appropriate communication channels, firms can encourage customers to engage with them and provide feedback, which can help to identify areas for improvement in their services (Cabral et al., 2019).

This can include things like providing customers with tools and resources to help them customize their experience or soliciting feedback from customers to improve the service over time. It can also involve seeking customer input on product design and development, involving customers in the testing and prototyping process, or even inviting customers to participate in the creation of new services (Gupta et al., 2021). Through interactions such as surveys, feedback forms, and customer service conversations, firms can gain insights into what their customers like and dislike about their services. They can also learn about their

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customers' specific needs and preferences, such as preferred communication channels, service delivery options, or product features (Park & Kim, 2021).

However, it is of utmost importance to establish a model in which knowledge and trust flow organically from clients to the firm. The transfer of knowledge and trust from customers to the firm is a critical component of co-creation in the SDL (Payne et al., 2021). This can involve things like engaging with customers through customer feedback, user-generated content, social media, online forums and communities, or customer service channels, and encouraging them to share their thoughts and ideas about the service. These processes allow customers to share their thoughts and ideas with the firm and can help to build trust and strengthen the relationship between the firm and its customers. By creating an environment of trust and open communication, firms can tap into the collective wisdom of their customer base and gain insights that can inform the development of new services (Vaia et al., 2022).

This informal process of sharing information and feelings plays a crucial role in integrating these elements into the development process. This is because when customers feel comfortable expressing their opinions, wishes and concerns informally, it creates an environment of genuine collaboration. This unstructured exchange of knowledge and trust allows the firm to deeply understand customers' needs and expectations. Through this informal dialog, the firm can uncover valuable insights that are often not captured through more formal methods such as surveys and questionnaires. This informal approach of transferring information and feelings not only enriches the development process, but also contributes to continuous innovation and to the creation of services that are more aligned with the real needs of customers (Albino et al., 1998; Jones & Macpherson, 2006). Furthermore, by cultivating a relationship where customers feel heard and valued, trust between the parties involved is strengthened. This creates a sense of partnership and loyalty, which in turn encourages clients to share honest feedback and actively participate in the development of new services.

Overall, developing strategies that involve customer interaction is a key component of a customer-centric business approach. For that, Hilton and Hughes (2013, p. 872) argued “the service organizations will need to articulate exactly what knowledge, skills, and capabilities their customers require; how they will acquire them, from where or from whom and what the associated learning curve will involve”. To effectively articulate what knowledge, skills, and capabilities their customers require, in addition to service organizations need to conduct research and gather insights on their customers' needs and preferences, service organizations need to consider how their customers will acquire the required knowledge, skills, and capabilities. This can involve providing training, tutorials, or online resources to help customers learn and develop the necessary skills (Veile et al., 2020). Service organizations may also partner with third-party providers to offer specialized training or education programs to their customers. At the same time, service organizations need to consider the associated learning curve and ensure that the process of acquiring knowledge, skills, and capabilities is smooth and easy for their customers. This can involve providing clear instructions and guidance, offering ongoing support and assistance, and creating a user-friendly interface or platform for learning.

Finally, the firms when design proposition of the value they need determinate who will be the interactions and how collecting data. In other words, it is important for firms to determine who will be involved in the co-creation process and how they will collect data from these customers. This can involve identifying key customer segments or personas and tailoring the co-creation approach and value proposition to meet their specific needs and preferences. When designing a value proposition for co-creation, firms need to take into consideration the

diverse interests and competencies of their customers and provide them with multiple ways to participate based on their individual preferences and capabilities. In addition, the firm needs to ensure that the co-creation process is structured and well-managed, with clear objectives and guidelines, and effective communication channels to facilitate collaboration and feedback. This can help ensure that the co-creation process is productive and results in meaningful outcomes for both the firm and its customers.

Thus, firms need to be aware that there are specific requisites of co-creation to be fulfilled:

1. understand the co-creation process is of high importance because it is seen as a central strategy for the success of the firm and the products and services it markets (Haro et al., 2014);
2. co-creation requires integrated and centralized development of the various sources of feedback received from customers, so that they can be addressed, and the firm improve the qualities of the products and services it markets as well as detect new market needs (Piller et al., 2011);
3. must be highly efficient internal communication channels so that the feedback results received from customers reach the appropriate divisions and in a timely manner so that they impact the productive process or service process (Kumar & Reinartz, 2016; Pansari & Kumar, 2016);
4. with co-creation there is a strong responsibility of the firm towards the customer, it has a responsibility to have people responding individually to each customer, in real time preferably, as well as monitoring the punctuality of the interaction for a successful experience (Kruger et al., 2018; Pansari & Kumar, 2016);
5. the firm has a responsibility to quantify interactions and their effects a so that it can improve the customer experience and improve business effects (Kruger et al., 2018; Pansari & Kumar, 2016);
6. the firm must be sufficiently competent to evaluate the feedbacks received from its customers in a qualitative and quantitative manner (Roberts et al., 2014);
7. the firm will have to be available so that its customers can share feedback with it whenever they want to do so, and will have to have appropriate communication channels (Kumar & Reinartz, 2016; Pansari & Kumar, 2016; Roberts et al., 2014);
8. the firm should ensure the confidentiality of feedbacks so that there is a direct interaction and can respond individually and in a timely manner (Kumar & Reinartz, 2016; Pansari & Kumar, 2016; Roberts et al., 2014).

In this line, according to Haro et al. (2014), co-creation is supported by three key elements:

1. Interaction - Co-creation involves a high degree of interaction between the customer and the firm. This interaction can take many forms, such as face-to-face conversations, online forums, or social media platforms. The key is that the customer and the firm are engaged in an ongoing dialogue that allows them to understand each other's needs and preferences.
2. Creativity - Co-creation is a creative process that involves the generation of new ideas and the exploration of new possibilities. Both the customer and the firm bring their own unique perspectives and knowledge to the process, and together they can create new solutions that are tailored to the customer's needs.
3. Social context - Co-creation takes place within a social context that includes the broader community of customers, stakeholders, and partners. This social context shapes the customer's experience and influences their perception of value. By

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engaging with the broader community, the firm can create a sense of belonging and build a stronger relationship with the customer.

By focusing on the social context, Haro et al. (2014) highlight the critical role employees play in the co-creation process, by shaping the customer experience and fostering positive customer relationships. Employees are often the primary point of contact between the firm and the customers and can significantly influence customers' emotions and perceptions.

Employees are not simply required to communicate corporate values and to provide a friendly face for customers. Employees do more than deliver customer service and interact with the customers – they can re-energize the brand and mission personalizing the relationship between customer and the firm. The social interaction between employees and customers can create a sense of connection and empathy; employees who are friendly, helpful, and responsive to customer needs can create a positive impression, leading to positive emotions such as trust, loyalty, and satisfaction.

Moreover, employees who are trained and empowered to provide excellent customer service can create a positive and memorable experience for customers (Bowen & Lawler III, 2006). In many cases, the employees with whom customers interact are highly skilled, carrying out critical transactions on behalf of their employers. They can anticipate customer needs, provide personalized recommendations, and resolve issues promptly, creating positive emotions and perceptions that foster customer loyalty. The performance of these employees will then be pivotal in ensuring a good overall customer experience and they can increment customer knowledge, product knowledge and practice knowledge (Karlsson & Skålén, 2015). Moreover, the way customers are treated by employees is a key issue when it comes to encouraging customers to return to buy or encourage them to recommend the firm to others.

The physical environment is also essential in shaping customers' emotions and perceptions (Han & Ryu, 2009; Zhong & Moon, 2020). Employees who are attentive to the physical environment, ensuring that it is clean, comfortable, and welcoming, can create a positive atmosphere that enhances the overall experience. All this can impact the process of co-creation.

Moreover, co-creation carries risk for the firms and the employees. The customers are not equal requiring the same thinks. The employees have the responsibility to ensure the success of all interactions between the firm and the costumers. According to Elmadağ et al. (2008), frontline employees are especially important in service settings because they play an active role in customer satisfaction. Therefore employees need to be trained to solve customer problems and to be familiar with the products and services the firm sells (Elmadağ et al., 2008; Prahalad & Ramaswamy, 2004b). Karpen et al. (2012) describes that experience learned by the employees through customer usage situations, preferences, and requirements can result in the co-creation of better value effects in future experiences.

Therefore, firms need to invest in their employees' training and development to ensure that they have the necessary skills and knowledge to provide exceptional customer service. By doing so, they can create a customer-centric culture that fosters positive customer relationships and drives business growth. After all, they are the "human face" of the firm and the contribution they give to improve customer loyalty and manage business performance is a difficult task.

The firm also has an obligation to design co-creation experiences for its employees so that they can provide a richer experience for their customers (Ramaswamy & Gouillart, 2010). This requires firms to be responsible for creating environments that facilitate co-creation, where platforms should be used for their employees to interact with their customers, meaning

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that employees are well-versed and have the necessary operational resources (Prahalad & Ramaswamy, 2004b).

Firms have to understand that employees have different responsibilities and develop different roles by facilitating co-creation experience for customers looking for their services (Prahalad & Ramaswamy, 2004b). Providing a personalized service requires that a firm be flexible when co-creating and implementing decisions that were determined by the customer and employees during their interaction during the mutual value co-creation experience (Gurău, 2009). Therefore, the expected attitude of employees must be adapted to the customer's skills and capabilities when they create value, they need to involve the customer in product development or service delivery, not forgetting that this sharing must also involve other stakeholders who are relevant (Fuchs & Schreier, 2010; Price & Chen, 1993).

In summary, co-creation involves a complex set of elements that need to be considered in order to create an effective and engaging co-creation environment. Some of the key dimensions that need to be considered in co-creation include (Frow et al., 2015; Piligrimienė et al., 2015; Ranjan & Read, 2014):

1. Trust - Building trust between the firm and its co-creation partners is essential, as it fosters open communication, knowledge sharing, and collaboration.
2. Diversity - Co-creation requires a diverse set of perspectives, skills, and expertise, to enable a broad range of innovative ideas and solutions.
3. Empathy - The firm should strive to understand and empathize with its co-creation partners, by putting themselves in their shoes and understanding their needs, preferences, and pain points.
4. Creativity - Co-creation is a process of generating new and innovative ideas and solutions, and therefore requires a high degree of creativity and out-of-the-box thinking.
5. Flexibility - Co-creation is an iterative process that requires flexibility and adaptability, as ideas and solutions evolve over time.
6. Communication - Effective communication is crucial for co-creation, as it enables the sharing of ideas, feedback, and insights between the firm and its co-creation partners.
7. Coherence - Co-creation requires coherence and alignment between the firm's goals and the goals of its co-creation partners, to ensure that the resulting solutions are meaningful and impactful.

Hence, to create a successful co-creation environment, the firm must take a multi-dimensional approach. Some of the key dimensions that firms should consider when building a co-creation environment include (Roser et al., 2013; Verleye, 2015; Zhang et al., 2015):

1. Culture - The firm's culture should support and encourage co-creation, by emphasizing collaboration, innovation, and customer-centricity.
2. Strategy - The firm's strategy should be aligned with the goals of co-creation, by focusing on customer needs and preferences, and prioritizing innovation and agility.
3. Processes - The firm's processes should be designed to facilitate co-creation, by providing the necessary tools, resources, and support for collaborative innovation.
4. Structure - The firm's organizational structure should be flexible and adaptable, to enable cross-functional collaboration and knowledge sharing.
5. Technology - The firm's technology infrastructure should support co-creation, by enabling real-time collaboration, data sharing, and feedback loops.

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6. Metrics - The firm's performance metrics should be aligned with the goals of co-creation, by measuring customer satisfaction, engagement, and the impact of co-created solutions on the market.
7. Leadership - The firm's leadership should be committed to co-creation, by providing vision, guidance, and support for collaborative innovation.

Firms need to have a strategy that makes their products and services interactive, which will imply having training for participants in co-creation environments, as well as having the ability to redesign the roles of those involved and develop a strategic architecture capable of responding to the information that arrives through digital channels and other more artisanal communication processes. This requires a range of skills and capabilities, including the ability to train participants in co-creation environments, redesign the roles of those involved, and develop a strategic architecture that can respond to information that arrives through digital channels and other communication processes.

To achieve this, firms need to invest in training programs and tools that enable their employees to collaborate effectively with customers and other stakeholders. This may involve developing new roles (Gruber et al., 2015) and responsibilities for employees, as well as investing in new technologies and systems that enable more efficient and effective communication and collaboration (Soosay et al., 2008), such as social media, online communities, and collaboration tools. Additionally, firms can develop strategies that encourage and incentivize co-creation with customers and stakeholders, such as offering rewards or recognition for contributions to product development or innovation. By investing in the right training, tools, and strategies, firms can position themselves to effectively engage with customers and stakeholders, and drive innovation and growth in their businesses (Casadesus-Masanell & Ricart, 2010).

In addition, firms need to develop a strategic architecture that can respond to the data and information that is generated through these co-creation processes. This may involve the use of advanced analytics tools and techniques, as well as the development of new organizational structures and processes. The development of new organizational structures and processes, such as cross-functional teams and agile methodologies, enables more efficient and effective collaboration (Mandolfo et al., 2020) that allow firms to respond quickly and effectively to changing market conditions and customer needs.

By investing in these areas, firms can foster a culture of innovation and collaboration, and create new opportunities for growth and success. By fostering a culture of innovation, firms can encourage creativity, risk-taking, and experimentation, which can lead to new and innovative products and services. Additionally, by emphasizing collaboration and teamwork, firms can bring together diverse perspectives and expertise, and create a culture of continuous learning and improvement. This can lead to more effective problem-solving and decision-making, and better outcomes for both the firm and its customers. By investing in a culture of innovation and collaboration, firms can position themselves for long-term success and growth (Sewchurran et al., 2019).

Ultimately, the ability to engage in co-creation processes is becoming a key differentiator for firms that want to stay competitive in today's digital environment. By involving customers and stakeholders in the innovation process, firms can gain new insights into customer needs and preferences and create products and services that better meet those needs (Brettel & Cleven, 2011), which can lead to increased customer satisfaction and loyalty, as well as increased revenue and market share. In addition, co-creation can help firms to stay agile and adaptive in a rapidly changing business environment, and to stay ahead of the competition.

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By taking a multi-dimensional approach to co-creation, firms can create an environment that fosters collaboration, innovation, and customer-centricity, and generates sustainable competitive advantages. Not only focused on an aspect, but on the set of elements that need to be considered so that participants can effectively feel involved. This leads to enormous challenges, especially due to the need to understand which dimensions need to be considered in each situation. But also, what dimensions are considered integral parts of co-creation. By taking a holistic approach and considering all of these dimensions, firms can create a co-creation process that generates innovative ideas, fosters collaboration, and creates meaningful value for all stakeholders involved.

1.8 Benefits and challenges of co-creation in Service-Dominant Logic

Co-creation has emerged as a powerful and transformative approach within the realm of management and market dynamics, profoundly impacting the relationships between firms and their customers. This collaborative strategy encompasses diverse dimensions that yield an array of benefits and advantages, fostering innovation, customer engagement, loyalty, and profitability. Co-creation not only influences traditional service research and innovation practices but also facilitates the development of novel solutions to intricate challenges through innovative approaches, propelled by technological advancements (Füller et al., 2011; Hamidi & Shams Gharneh, 2017).

Moreover, the influence of co-creation extends to decision-making processes, accelerating the quality and pace at which judgments are made. By harnessing customer input, firms gain insights to refine ideas and sift through concepts, leading to effective decision-making (Füller et al., 2011; Lawson & Samson, 2001; Lee & Trimi, 2018; Prahalad & Ramaswamy, 2004a, 2004b; Skålén et al., 2015). This involvement enhances the service delivery by refining solutions to precisely meet customer needs (Füller et al., 2011; Skålén et al., 2015). The co-creation strategy also establishes an environment of collaborative and participatory development, aligning the interests of firms and customers to enhance service delivery (Füller et al., 2011; Lawson & Samson, 2001; Skålén et al., 2015).

Co-creation is instrumental in organizational change, bridging knowledge and learning processes. The engagement of customers in change processes constructs new values and meanings, thereby catalyzing the innovation of services (Payne et al., 2008). Information and communication technologies (ICTs) further augment this process, offering a plethora of benefits to both customers and firms through direct interaction (Füller et al., 2011; Füller et al., 2009). Firms can credit customer engagement for innovative ideas, fostering competitive advantages and enhancing service quality (Bitner et al., 1997; Füller et al., 2011; Kelley et al., 1990).

Indeed, active customer participation reaps substantial benefits across multiple dimensions. Customers contribute to increased productivity by engaging in self-service tasks, amplify two-way communication networks, facilitate customer segmentation strategies, elevate perceived service quality, stimulate repurchase behavior, and endorse the quality of services through word-of-mouth (Cermak et al., 1994; File et al., 1992; Kelley et al., 1990; Lovelock & Young, 1979; Prahalad & Ramaswamy, 2004a; Song & Adam, 1993). This active participation transforms customers from passive recipients to valuable resources for knowledge, competencies, and service improvement (Bettencourt et al., 2002; Prahalad & Ramaswamy, 2000).

Moreover, customers serve as pivotal partners in co-creating value, as their engagement influences service recovery, enhances customer satisfaction, reduces risks for firms, and encourages repeat purchases (Dong et al., 2008; Kumar et al., 2019; Maklan et al., 2008;

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Nambisan & Baron, 2007; Roggeveen et al., 2012; Roser et al., 2013). This dynamic interaction is not confined to physical or digital realms but is also propagated through social networks, enriching the co-creation experience (Füller et al., 2011; Skålén et al., 2015).

The efficacy of co-creation is evident in its influence on customer loyalty, with participation intensity, service complexity, and experience-based services all contributing to enhanced loyalty (Kumar et al., 2019; Kwon, 2020; Sugathan & Ranjan, 2019). However, the concept of co-creation remains multifaceted and its impact warrants further empirical exploration on outcomes such as customer satisfaction, loyalty, and firm performance (Goyal et al., 2020; Sjödin et al., 2020). Moreover, co-creation spans five key themes encompassing actors, processes, outcomes, context, and technology, amplifying its role in the value creation process (Murray et al., 2021; Ranjan & Read, 2021). Customized customer engagement strategies and resources are pivotal for successful co-creation outcomes, underlining the importance of meticulous planning (Nadeem, Tan, et al., 2021).

The advantages of co-creation within the framework of SDL are multifaceted and far-reaching. Co-creation serves as a catalyst for inspiration, instigating a comprehensive shift toward customer-centric business models, fostering operational improvement and insights, thereby optimizing service delivery (Fuentes et al., 2019; Grönroos & Voima, 2013; Tommasetti et al., 2017). This collaborative approach empowers firms to enhance product quality, glean from customer insights, and ultimately institutionalize customer-oriented cultures (Cermak et al., 1994; File et al., 1992; Füller et al., 2011; Kelley et al., 1990). As customers contribute their expertise and co-create experiences, innovation flourishes, leading to heightened customer engagement, reputation augmentation, and reduced costs (Bitner et al., 1997; Füller et al., 2011; Grönroos, 2012).

Co-creation engenders better alignment with customer needs, fosters increased customer satisfaction, and solidifies loyalty (Cermak et al., 1994; Füller et al., 2011; Maru File et al., 1992; Prahalad & Ramaswamy, 2004a). This approach enhances brand awareness, customer advocacy, and competitive advantage, steering firms toward greater profitability and efficiency (Fazal-e-Hasan et al., 2017; Jung & Seock, 2017; Lin et al., 2010; Victorino et al., 2005). By actively involving customers, firms optimize resource allocation, amplify employee engagement, and cultivate enduring relationships, leading to sustainable growth and long-term success (Romero & Molina, 2011; Shu & Xiao, 2015).

Co-creation is indeed a multifaceted strategy that manifests as a powerful tool for innovation, amplifying customer trust, brand building, and operational efficiency (Ramaswamy & Gouillart, 2010). Through collaborative participation, firms create a new paradigm where stakeholders collectively shape products, services, and business models, yielding enduring benefits, competitive edge, and long-term success (Kambil et al., 1999). Co-creation's impact transcends tangible outcomes, spurring customer loyalty, advocacy, and efficient communication (Jung & Seock, 2017; Park & Ha, 2016; Rajah et al., 2008). By embracing co-creation, firms not only amplify customer satisfaction but also engage in a strategic partnership that fuels innovation, fosters loyalty, and propels the firm toward a future of sustained growth and prosperity.

In summary, there are several multifaceted benefits of co-creation in business innovation and customer engagement:

- Enhanced Flexibility and Adaptability - Co-creation's role in facilitating quicker adaptations aligns with the concept of agility in business. As mentioned by Hossain et al. (2020), involving customers in the innovation process enhances the firm's responsiveness to changing market dynamics, fostering a more agile and competitive stance.

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- Cross-Functional Collaboration - Chesbrough (2010) highlights how co-creation breaks down organizational silos and promotes cross-functional collaboration, enabling a broader range of expertise to contribute to innovation. This interdisciplinary approach stimulates creativity and fosters holistic problem-solving.
- Cultural Diversity and Global Reach - The significance of co-creation in catering to diverse cultural preferences is echoed by Prahalad and Ramaswamy (2004a) and Porter and Kramer (2018). They stress that co-creation allows businesses to tap into the "bottom of the pyramid" markets, providing solutions that resonate with various cultural contexts.
- Sustainable Practices - Co-creation's potential to drive sustainable innovation is underscored by Elkington (1998), who introduced the concept of the "triple bottom line". By involving stakeholders in sustainable product design, co-creation aligns with the social and environmental dimensions of this framework.
- Personalized Marketing and Communication - Pine and Gilmore (2011) emphasize the shift from a service economy to an experience economy. Co-creation facilitates the design of personalized and memorable experiences, aligning with their ideas on creating value through customer engagement.
- Knowledge Sharing and Learning - Prahalad and Krishnan (2008) argue that co-creation is a knowledge-sharing process where customers contribute their insights, while firms contribute resources. This collaborative learning approach drives innovation and continuous improvement.
- Rapid Prototyping and Testing - Von Hippel (2005) and Lüthje et al. (2005) highlights how co-creation allows for rapid prototyping and iterative development, reducing the time and cost required to bring products to market.
- Elevated Customer Empowerment - Building on the concept of empowerment, Füller et al. (2008) discuss the psychological benefits of co-creation, including a sense of ownership and emotional attachment among customers, leading to increased loyalty.
- Long-Term Relationship Building - Grönroos (2008a) emphasizes the role of co-creation in building long-term customer relationships based on trust and mutual value creation. Co-creation extends beyond transactional interactions to foster enduring partnerships.
- Inclusive Innovation - Robinson et al. (2021) argues that co-creation democratizes innovation by involving a wider range of stakeholders, promoting inclusive and equitable development that addresses diverse needs.
- Data-Driven Decision Making - Co-creation's reliance on customer insights aligns with the principles of data-driven decision-making advocated by Davenport (2006) and Jia et al. (2015). The integration of customer-generated data enhances the accuracy and relevance of strategic choices.
- Enhanced Competitive Differentiation - Kim and Mauborgne (2014) aligns with co-creation's role in creating unique value propositions. Co-creation helps firms break away from competitors and explore untapped market spaces.
- Enhanced Supply Chain Collaboration - Prahalad and Ramaswamy (2004a) and Brun et al. (2020) also discuss the collaborative supply chain benefits of co-creation. Involving suppliers and partners in the co-creation process leads to more streamlined operations and innovative solutions.

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- Ethical and Social Responsibility - Co-creation's potential for ethical and social impact is supported by Porter and Kramer (2011). Co-creation enables businesses to contribute to societal progress while achieving commercial success.
- Real-time Feedback Loop - Von Hippel (1986) and Tsiouris et al. (2020) research on lead user innovation relates to co-creation's real-time feedback loop. Involving lead users in the innovation process ensures that products and services meet evolving customer needs.

However, the realm of collaboration and co-creation, while replete with potential, is not without its challenges. These challenges, arising from the dynamic interplay between firms and consumers, are essential facets that shape the course of co-creation's transformative journey. As experience reshapes consumer expectations, the threshold for dissatisfaction becomes more delicate, necessitating a comprehensive understanding of the challenges that emerge (Sarker & Bjørn-Andersen, 2012).

A primary challenge lies in the art of managing expectations, a task amplified by the heightened involvement of customers in the development process. Co-creation elevates customer expectations, urging firms to navigate a delicate balance between aspiration and attainability. Successfully negotiating this challenge demands an astute management approach to ensure expectations remain both realistic and achievable (Biemans, 1995).

Furthermore, the tapestry of co-creation is woven with the diverse needs of customers. Each customer, with unique preferences and requirements, adds layers of complexity to the process. The challenge at hand is to cater to this array of needs, crafting products and services that resonate with a wide spectrum of clientele (Grönroos, 2012).

Amidst this creative dance, the challenge of harmonizing customer input with strategic business goals surfaces. While customer collaboration is invaluable, it can introduce misalignment with organizational objectives. This necessitates skillful navigation to synthesize these inputs, ensuring a cohesive strategy that benefits both parties (Agrawal & Rahman, 2015).

The sharing of sensitive information and intellectual property forms another intricate challenge. Co-creation's collaborative spirit may inadvertently expose proprietary knowledge, urging firms to safeguard their competitive advantage. Here, the challenge lies in fostering trust while ensuring the protection of intellectual property (Hilton & Hughes, 2008; Hilton et al., 2012).

Yet, the challenge that spans across these facets is the orchestration of the co-creation process itself. Managing the interplay of diverse stakeholders, each contributing distinct inputs, demands strategic coordination. The efficiency and productivity of this complex process hinge on effective management, ensuring the culmination of valuable outcomes (Neto et al., 2015; Neto et al., 2017).

External collaborations, as highlighted by Biemans (1995) and Sarker and Bjørn-Andersen (2012), inject a distinct layer of challenges. Dependency, coordination, and the potential for conflicts emerge when engaging with external players. Capitalizing on the strengths of collaborators while balancing competing dynamics is crucial

These challenges, though formidable, do not hinder the transformative potential of co-creation. Instead, they serve as catalysts for enhanced collaboration, innovation, and growth. The journey of co-creation is inherently enriched by these challenges, with each hurdle illuminating a pathway towards deeper engagement and co-creative value (Cossío-Silva et al., 2016; Ida, 2017; Mihailova et al., 2022; Vega-Vazquez et al., 2013).

The challenges of co-creation are not mere obstacles; they are pivotal elements that enrich the collaborative process. Navigating these challenges embodies a transformative

journey, where the fusion of innovation, collaboration, and strategic management propels organizations towards unparalleled growth and prosperity.

As the co-creation narrative unfolds, customers too transform into active participants. This dynamic exchange becomes a source of mutual growth, fostering a culture of learning and innovation (Homburg et al., 2009). Such interactions transcend the conventional context, unveiling diverse practices and innovative solutions (Chathoth et al., 2013; Ernst et al., 2017; Hoyer et al., 2010).

In this journey of co-creation, the interplay between firms and customers forms a dynamic platform for value formation. Appropriately harnessed, these interactions serve as fertile ground for learning, enhancing service efficiency. Establishing effective communication channels and engaging customers in the production process amplify co-created value, reshaping the landscape of service delivery (Cossío-Silva et al., 2016; Cui & Meng, 2021; Grönroos, 2012; Vega-Vazquez et al., 2013; Zadeh et al., 2019).

1.9 RESEARCH GAPS IDENTIFIED

In this sub-section the various gaps that were found in the literature review on SDL and co-creation will be presented.

The subsequent analysis of these gaps in recent research endeavors has been carefully conducted, with a concentrated focus on offering insightful recommendations for future research directions. Additionally, special attention is placed on identifying non-significant relationships as detailed in the table provided below.

This thorough examination of gaps is an essential step toward a more comprehensive understanding of the current state of knowledge in the domain of SDL and co-creation. By acknowledging these voids in the existing body of literature, one can not only identify areas where further research is warranted but also highlight the nuances of relationships that might have been overlooked or deemed non-significant.

The ultimate goal of this section is to act as a springboard for advancing the comprehension of SDL and co-creation, guiding future studies toward unexplored territories and providing a more holistic perspective on the intricate dynamics at play in this context.

Table 8. List of Gaps

Paper	Authors / Year	Journal	Gap – Future Line Research Recommendations
"Five Co-s" in innovating: a practice-based view	Russo-Spena et al. (2012)	Journal of Service Management	In analyzing the collaboration of customers who are involved as resource integrators, it would be helpful to understand how firms can improve co-creation practices for innovation.
Consumer engagement in a virtual brand community: An exploratory analysis	Brodie et al. (2013)	Journal of Business Research	The role of development platforms and the interactions that occur between employees, customers and the co-creation of value that is created are also important areas that deserve further investigation.
The dark and the bright side of co-	Gebauer et al. (2013)	Journal of Business	1 - Co-Creation Experience don't have influence in Word-of-Mouth

Paper	Authors / Year	Journal	Gap – Future Line Research Recommendations
creation: Triggers of member behavior in online innovation communities		Research	2 – Dis-/Satisfaction with Outcome don't have influence in word-of-mouth
Value creation processes and value outcomes in marketing theory	Gummerus (2013)	Marketing Theory	The role of experiences as the common denominator for value creation processes and value outcomes should be investigated further.
The value co-creation process as a determinant of customer satisfaction	Vega-Vazquez et al. (2013)	Management Decision	Explore the potential influence that the third variables could have on the relationship of co-creating value - customer satisfaction. It would therefore be beneficial to extend the study to other possible consequences of the co-creation process in order to build a broad theoretical framework on the consequences of co-creation as well as its antecedents. We would then know which factors promote value creation and which act as barriers.
Effect of Customer Participation on Service Outcomes	Dong et al. (2014)	Journal of Service Research	Explore antecedents of Consumer Participation readiness.
Value Co-Creation Process: Effects on the Consumer and the Company	Haro et al. (2014)	Expert Journal of Marketing	identify in the real world, direct and indirect co-creation activities that influence businesses and consumers (trust, satisfaction, loyalty)
Exploring consumers' motivations to engage in innovation through co-creation activities	Roberts et al. (2014)	European Journal of Marketing	Empirical work on forms of co-creating value is needed to deepen understanding of consumer motivation to participate in such activities.
A Generalized Multidimensional Scale for Measuring Customer Engagement	Vivek et al. (2014)	The Journal of Marketing Theory and Practice	It is necessary to study the impact of the customer engagement on other consequences, such as citizenship behavior and customer satisfaction.
A Systematic	Voorberg et al.	Public	The examination of effects of co-

Paper	Authors / Year	Journal	Gap – Future Line Research Recommendations
Review of Co-Creation and Co-Production: Embarking on the social innovation journey	(2014)	Management Review	creation or co-production as such and in relation to social innovation in particular
Effects of sales force market orientation on creativity, innovation implementation, and sales performance	Wang and Miao (2015)	Journal of Business Research	"Creativity and innovation could be related to products, services, business processes, administrative processes, and could be incremental or disruptive in nature, future research may examine the possibly different antecedents, moderators, and effects of different types of innovation"
Service value exchange in B2B electronic marketplaces	Standing et al. (2015)	Journal of Business & Industrial Marketing	Supported in the SDL of e-marketplaces, it was appropriate to determine the full extent of the benefits of services resulting from participation in digital networks. Based on surveys and case studies they can be used to investigate a typology of service benefits resulting from participation in the e-marketplace.
The effect of Co-Creation Experience on effect variable	Mathis et al. (2016)	Annals of Tourism Research	"Future research should expand the concept of co-creation of an experience"
The impact of sellers' social influence on the co-creation of innovation with customers and brand awareness in online communities	Wang et al. (2016)	Industrial Marketing Management	"Results indicate that sellers' social influence significantly affects co-innovation practice, future research could consider other social behavior theories or the role of intrinsic and extrinsic motivational factors in the context of online communities."
Antecedents and consequences of virtual customer co-creation behaviors	Frasquet-Deltoro et al. (2018)	Internet Research	Future research could examine additional antecedents of co-creation behaviors in the online environment.
Co-creating services-conceptual	Oertzen et al. (2018)	Journal of Service Management	Research is needed on the specific forms of co-creating services and subsequent effects.

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Paper	Authors / Year	Journal	Gap – Future Line Research Recommendations
clarification, forms and outcomes			
Enabling value co-creation with consumers as a driver of business performance: A dual perspective of Polish manufacturing and service SMEs	Zaborek and Mazur (2019)	Journal of Business Research	"co-creation enablers applied by firms and performance benefits gained by them", bus it is also "taking a holistic view of the value co-creation process to investigate co-creation not only in customer-firm dyads but in systems involving more actors".
Internet-based consumer Co-Creation Experience of the new product development process	Khrystoforova and Siemeniako (2019)	Engineering Management in Production and Services	A study covering three stages, U&G Antecedents, Attitudes and Consequences of co-creation, is presented. The Consequences stage is limited to studying satisfaction and participation in co-creation and there is no in-depth study of the effects generated that may stem from the benefits studied in the U&G Antecedents stage.
Co-creation and integrated resort experience in Croatia: The application of service-dominant logic	Ahn et al. (2020)	Journal of Destination Marketing & Management	Analyze the consequences resulting from the co-creation experience on customers' behavioral attitude.
Investigating the Role of Customer Co-Creation Behavior on Social Media Platforms in Rendering Innovative Services	Moghadamzadeh et al. (2020)	Sustainability	"studying the impact of different aspects of social co-creation on the delivery innovative services beyond considering it as a moderating variable"
What facilitates and constrains value co-creation in online communities: A sociomateriality perspective	Priharsari and Abedin (2021)	Information & Management	While sense of community is known to be an important facilitator of participation in online communities, it is important to know whether it also influences the co-creation experience.
The antecedents	Xie et al. (2021)	Journal of	Study the factors resulting from the

Paper	Authors / Year	Journal	Gap – Future Line Research Recommendations
and consequences of the Co-Creation Experience in virtual tourist communities: From the perspective of social capital in virtual space		Hospitality and Tourism Management	co-creation experience, such as customers being loyal to the platform that supports the engagement with the community.
Pricing and investing in co-creation with customers for a duopoly	Yang et al. (2021)	International Journal of Production Economics	"This study assumes that customers participate in co-creation in the initial stage. Investigating in different levels of involvement in co-creation may point to an interesting topic." It studies consumer involvement based on the price of products or services as an influencing factor but does not address consumer involvement when the reason for involvement is not price.
Value co-creation on a shared healthcare platform: Impact on service innovation, perceived value and patient welfare	Akter et al. (2022)	Journal of Business Research	"Future research could explore beyond the identified resources, practices and examine if additional outcomes of Value co-creation are possible."
Influencer marketing: Homophily, customer value co-creation behaviour and purchase intention	Bu et al. (2022)	Journal of Retailing and Consumer Services	"This study may not include other influencing factors that might impact value co-creation in influencer marketing. Future studies could continue to explore other essential factors in influencing value-creation, such as source credibility and tie strength"
Impact of online community interaction on value co-creation: Evidence from China	Luo and Li (2022)	Problems and Perspectives in Management	"The inner mechanism of customers taking part in value co-creation needs to be thoroughly researched. To encourage customers to participate in value co-creation, additional variables that affect value co-creation would be identified in future studies"

Source: Own elaboration

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The arena of co-creation and innovation is a complex, interdisciplinary field dedicated to exploring collaboration between customers and firms in the process of generating value and innovation. Comprehensively addressing the various elements of this process requires a holistic perspective that considers current knowledge gaps and their interconnections.

At the heart of this analysis, the gap identified by Russo-Spena et al. (2012) highlight the imperative of understanding the dynamics of co-creation and the role played by customers in this context. This understanding provides a foundation for several subsequent interrelationships. The links between the gaps stated in Russo-Spena et al. (2012) and Frasquet-Deltoro et al. (2018), who highlight the need to examine additional antecedents of co-creation behaviors in the online environment, are also discernible, since elucidating co-creation practices has a direct influence on the motivational factors that drive participation in online communities. In this way, understanding co-creation practices transcends their singular role and manifests as foundations for broader connections. This perspective can therefore feed the advancement and deepening of co-creation theory, enriching it with insights into the collaboration between firms and customers in the development of products and services.

On the other hand, exploring customer engagement in co-creation can engender a more comprehensive understanding of their contribution to innovation and the development of products and services. The confluence of the two gaps therefore highlights the need to investigate the relationship between insight into co-creation practices and the motivational catalysts that drive participation in online communities. This scrutiny provides greater clarity about the motivations behind individuals' involvement in online platforms, thus broadening the scope of research into virtual social interactions.

By investigating the interaction between enriching experiences and value creation, as proposed by Gummerus (2013), it is possible to improve our understanding of how customer experiences influence the perception of value, consequently affecting customer satisfaction. Such an analysis can reveal how the design of experiences positively impacts the evaluation that customers make of products, services or brands.

In parallel, focusing on the detailed analysis of the effects resulting from the antecedent elements of co-creation, in the light of Khrystoforova and Siemeniako (2019) proposal, can provide a clearer view of how co-creation practices and interactions influence final results. This would encompass a deeper understanding of how active customer participation, knowledge exchange and collaboration are tangible in the quality of co-created products or services, directly influencing customer satisfaction.

Also, the convergence between the gap identified in Gummerus (2013), which highlights the relevance of experiences in value creation, and the gap identified in Khrystoforova and Siemeniako (2019), which highlights the need for a comprehensive analysis of the effects stemming from the antecedent elements of co-creation, suggests fertile ground for deepening our understanding in various dimensions.

The combination of these approaches could generate a deeper understanding of the interconnection between co-creation experiences and activities, outlining their influence on the perception of value and the results achieved. This more comprehensive approach could provide valuable insights to optimize co-creation strategies and thus improve both customer satisfaction and value creation. Additionally, such findings would have substantial practical implications for firms and organizations seeking to make the most of co-creation. By deepening our understanding of how co-creation experiences and activities interact to shape perceptions and outcomes, firms can adapt their approaches and strategies, favoring more

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effective collaboration and, consequently, achieving better performances in terms of perceived value and customer satisfaction.

Similarly, the gap identified in Mathis et al. (2016) suggests an analysis of the various facets of the co-creation experience that can be enriched when studied in conjunction with that identified in Wang et al. (2016), which takes into account the relationship between behavioral theories and social influence on innovation.

The gap identified in Mathis et al. (2016), draws attention to the need for a more in-depth analysis of the various facets of the co-creation experience. Exploring these facets, which can include cognitive, emotional and behavioral aspects of the participants, can provide a richer understanding of the motivations, perceptions and interactions that take place in the co-creation process. This can lead to insights into how the individual experience of participants influences collective outcomes and how different elements of co-creation interconnect.

The gap identified in Wang et al. (2016), highlights the importance of behavioral theories and social influence in innovation. By examining how behavioral factors, such as intrinsic and extrinsic motivations, affect participation in co-creation, can better understand the reasons why individuals choose to get involved and actively contribute to collaborative processes. In addition, considering social influence broadens our understanding of how social interactions, group norms and social pressures can affect co-creation behavior and, consequently, the resulting innovation.

The integrated approach of the gaps identified in Mathis et al. (2016) and Wang et al. (2016) can provide valuable contributions to the advancement of scientific knowledge, allowing for a more comprehensive and sophisticated analysis of the psychological and social facets of co-creation and their relationship with innovation, as this interconnection addresses both the psychological dimensions of co-creation and the social influences that shape its dynamics. By combining these two perspectives, can gain a more holistic and integrated view of the complex interactions between the psychological and social dimensions of co-creation. This can lead to a deeper understanding of how individual motivations intertwine with social influences on shape collaboration and the generation of innovative ideas. Analyzing these gaps together can also reveal patterns and relationships that may not be evident when considering each gap in isolation, allowing for a more refined and complete analysis of the interaction between psychological and social factors in co-creation.

This integrated approach can have practical implications for the management of co-creation and the development of strategies that promote an environment conducive to innovation. Furthermore, by advancing the understanding of the motivations and influences that drive co-creation, this approach can provide valuable insights for designing more effective engagement and collaboration programs, both within organizations and in partnership with external stakeholders.

The joint analysis of the gaps identified in Standing et al. (2015) and Luo and Li (2022) can generate significant contributions to scientific knowledge, offering in-depth insights into the motivations and benefits of participating in value co-creation.

The first gap, identified in Standing et al. (2015), highlights the need to investigate the benefits of participation in co-creation. Exploring these benefits can provide a clearer understanding of the tangible and intangible outcomes that participants gain from collaborating in value co-creation. By understanding these benefits, whether in terms of learning, recognition, satisfaction or others, can improve our knowledge of the value perceived by the participants and the organizations involved.

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The gap identified in Luo and Li (2022) focuses on the internal mechanisms and motivations of customers in the co-creation of value. By investigating the psychological, social and behavioral factors that drive participation in co-creation, can gain deeper insights into why customers engage in this collaborative process. This can involve analyzing intrinsic motivations, such as the search for authenticity and expression, as well as extrinsic motivations, such as tangible rewards and social recognition.

By considering these the lasts two gaps in an integrated way, can gain a comprehensive view of the motivations, mechanisms and benefits of value co-creation. This can lead to a more complete and contextualized understanding of how people are encouraged to actively participate in co-creation and how this participation can affect both individual and organizational results. Furthermore, analyzing these gaps together can inform the design and implementation of more effective co-creation strategies, considering not only the desired outcomes but also the underlying motivations that drive participation. This can be valuable for firms and organizations seeking to involve customers in a more meaningful and sustainable way in their co-creation processes.

Next, and once the need to investigate the co-creation experience, the motivators that lead to co-creation participation and shape the experience and their subsequent outcomes has been established, a detailed analysis on different motivators and outcomes is presented.

It is essential to recognize the crucial role played by platform architecture and interactions in the context of co-creation, as underlined in the gap identified by Brodie et al. (2013). This connection expands when related to the gap discovered by Oertzen et al. (2018), who highlight the pressing need to deepen the understanding of the various modalities of service co-creation and their corresponding outcomes. This focuses on the multiplicity of co-creation approaches and the outcomes that accompany them. Platforms and interactions, in fact, figure as the fundamental underpinning of these modalities, exerting a direct influence on the results achieved.

Studying these aspects can help broaden our understanding of how the structure of platforms and the interactions between participants have an impact on collaboration and the co-generation of value. At the point where these two gaps converge, the emphasis on understanding the different forms of co-creation and their correlated results emerges, driving the exploration of the various approaches through which co-creation manifests itself. The fact that platforms and interactions constitute the essential foundation that supports the different co-creation modalities and undoubtedly drives the results achieved highlights the centrality of these components. This insight could prompt further research into how the inherent characteristics of the platforms and the interactions between those involved reverberate in the outcomes of co-creation. Deepening this understanding can provide essential insights for the development of more effective co-creation strategies and for the optimized management of the platforms involved.

At the same time, the correlation between the observed gap in consumer readiness for co-creation, as discussed by Dong et al. (2014), and the gap related to social co-creation in the provision of innovative services, as addressed by Moghadamzadeh et al. (2020), reveals a fundamental connection between these two crucial aspects. Analyzing consumers' readiness for co-creation can provide valuable insights into the factors that drive or hinder consumers' active participation in co-creation processes. Understanding the elements that affect consumers' willingness to collaborate can be crucial for designing more effective engagement strategies and for creating an environment conducive to participation. In turn, research into social co-creation in the provision of innovative services addresses how collaboration between consumers and service providers can lead to a sharper perception of innovation and value.

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Social co-creation not only involves consumers in the creation of innovative solutions but can also positively influence their perception of the quality and relevance of the services offered.

The interconnection between two gaps, identified in Dong et al. (2014) and Moghadamzadeh et al. (2020), suggests an interdependent cycle: consumers' readiness for co-creation can influence their participation in social co-creation, and, in turn, the experience of social co-creation can affect their future readiness and motivation to participate in similar processes. This integrated approach has the potential to provide a more complete understanding of the factors that drive consumer collaboration and the resulting effects. Furthermore, the insights derived from these investigations can be applied to consumer engagement strategies, the development of innovative services and the creation of perceived value.

The gap analysis evidenced in Haro et al. (2014), which emphasizes the relevance of examining co-creation activities in the real world, lays a solid foundation for understanding the dynamics of co-creation in practical and authentic settings. This approach can provide valuable insights into how co-creation activities unfold in real-world contexts, considering the complexities and nuances of interactions between participants. The interconnection of this gap with the gap identified in Priharsari and Abedin (2021), which urges investigating the role of sense of community in co-creation, is particularly intriguing. The notion that face-to-face co-creation activities can reinforce a sense of community is illuminating, suggesting that face-to-face interaction can cultivate an environment conducive to collaboration and engagement between participants. This could have profound implications for the design of more effective co-creation strategies.

The synergy between these gaps offers a comprehensive view of how social factors influence co-creation. Understanding how co-creation activities take place in real life and how sense of community can play a key role in this process can enrich our understanding of the motivations, barriers and facilitators of collaboration between individuals. This combined approach can inform the development of practical guidelines for the successful implementation of co-creation initiatives, considering both the practical and social aspects involved. In addition, it can generate insights into how to create environments that foster a greater sense of community and connection between participants, encouraging co-creation.

Subsequently, exploring the connection between the co-creation experiences and tangible outcomes, as suggested by Gebauer et al. (2013), has the potential to provide a solid theoretical basis for directly understanding how co-creation impacts customer satisfaction and other measurable outcomes. The gap, outlined by Gebauer et al. (2013), underlines the importance of a direct analysis of the relationship between the co-creation of experiences and concrete results, such as customer satisfaction.

However, by considering multiple actors and variables, as addressed by Zaborek and Mazur (2019), this relationship can be framed in a more intricate environment, taking into account the way in which various stakeholders can exert influence on such outcomes. Thus, the need to explore the interconnection between the co-creation experience and its outcomes, as indicated by the gap identified in Gebauer et al. (2013), coupled with a comprehensive perspective involving multiple stakeholders, as observed in Zaborek and Mazur (2019), can result in a more comprehensive and insightful understanding.

The convergence between the co-creation experiences and the multi-stakeholder approach facilitates analysis in more complex environments that are consistent with reality. This makes it possible to understand how different protagonists, such as customers, employees and partners, play interactive roles and are reciprocally affected by the co-creation process. This contextualization is of crucial importance for deciphering how co-creation works in real

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situations, where multiple factors interact and influence the results. Hence, merging these two perspectives has the potential to generate a deeper and more complete understanding of the processes underlying co-creation and the ramifications that flow from it. From this synergy of approaches, several possible contributions emerge.

Similarly, the relationship between the gap identified by Vega-Vazquez et al. (2013), which suggests the need to explore the factors that shape the relationship between co-creation and customer satisfaction, and the gap identified by Ahn et al. (2020), which proposes investigating the direct and indirect impacts of the co-creation experience on customers' behavioral attitudes, provides an extremely relevant view of co-creation as a driving force in customers' attitudes and behaviors.

While the gap highlighted in Vega-Vazquez et al. (2013) directs research towards customer satisfaction, the gap study identified in Ahn et al. (2020) expands the scope, analyzing how co-creation influences attitudes and behaviors in a broader context. This suggests that co-creation not only influences satisfaction, but also shapes customers' broader attitudes and behaviors towards the brand, products and services. This expansion of scope can lead to deeper insights into the role of co-creation in building relationships and customer loyalty.

From the merging of the gaps in Vega-Vazquez et al. (2013) and Ahn et al. (2020), emerges an emphasis on the importance of perceiving co-creation not only as an enabler of customer satisfaction, but also as a fundamental element in customer attitudes and behaviors. This broader perspective provides a holistic view of the dynamics underlying the relationship between co-creation, customer satisfaction and the corresponding behavioral outcomes. The careful and comprehensive exploration of these identified gaps offers valuable perspectives that enrich the understanding of the interactions between co-creation, customer satisfaction and their behavioral effects.

It is essential to explore both customer satisfaction and customer behavioral attitudes in the context of co-creation. This approach can stimulate interdisciplinary integration, combining knowledge from the fields of marketing, consumer psychology and organizational behavior. The convergence of these disciplines can provide innovative insights into how co-creation influences customer perceptions and actions, enriching our understanding of the complex interactions involved.

The connection between the empirical research on co-creation presented in Roberts et al. (2014) and the investigation into the relationship between factors arising from the co-creation experience and customer loyalty explored in Xie et al. (2021) is remarkable and offers an intriguing opportunity to broaden our understanding. The analysis of these two studies and the gaps identified when they were targeted could give rise to a collection of empirical data resulting from the respective research that could provide valuable insights into the complex interaction between co-creation experiences and customer loyalty.

From these identified gaps and the analysis of the empirical data, it is possible to move forward in understanding the mechanisms by which co-creation experiences can influence customer loyalty. This could involve identifying the specific elements of co-creation that have the greatest impact on creating a lasting bond between customers and the firm.

In addition, analyzing the connections between the gaps in the studies by Roberts et al. (2014) and Xie et al. (2021) can provide insights into how co-creation strategies can be designed and implemented to boost customer loyalty. This may include identifying co-creation practices that significantly contribute to building a strong and lasting relationship with customers, leading to greater loyalty and engagement.

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A deeper understanding of these relationships can enrich customer relationship management approaches and influence the development of more effective co-creation strategies. In addition, this combined analysis can offer practical guidelines for firms on how to leverage co-creation experiences as a means of increasing customer loyalty and building long-term relationships.

The synergy between the gaps identified in Vivek et al. (2014), which explores the impact of customer engagement in underexplored scenarios, and Yang et al. (2021), which covers different levels of engagement in co-creation, can substantially enrich scientific knowledge. By deepening the understanding of the impact of customer engagement through the convergence of these two gaps, it is possible to carry out a more comprehensive and thorough analysis of the implications of customer engagement in less researched scenarios. This approach can reveal nuances and specific insights into how different levels of engagement influence the unfolding of co-creation in diverse contexts, providing a holistic perspective on the intricate interactions between customer engagement and the results obtained.

Furthermore, by analyzing the identified gaps together, it is possible to identify patterns in the different degrees of customer engagement in co-creation. This can provide a deeper understanding of customer motivations and behaviors in a variety of scenarios, contributing to a more precise categorization of the types of involvement and their consequences. Considering the manifestation of participation in diverse contexts can additionally provide insightful conclusions, which in turn can direct the development of adaptive co-creation strategies. This approach would allow firms to adjust their tactics according to the different degrees of engagement and scenarios, thus maximizing the beneficial results of co-creation.

The analysis of the impacts of co-creation and innovation, as investigated by Voorberg et al. (2014), has an intrinsic relationship with the deeper understanding of the additional outcomes stemming from value co-creation, as explored by Akter et al. (2022). While the gap study identified in Voorberg et al. (2014) examines impacts in general, the gap identified in Akter et al. (2022) focuses on specific outcomes, providing a more detailed and focused analysis.

The intersection of these two studies can contribute significantly to the advancement of scientific knowledge regarding co-creation and its effects. By uniting the broader perspective of the general impacts of co-creation, presented in Voorberg et al. (2014), with the more specific and in-depth investigation of the specific outcomes of value co-creation, presented by Akter et al. (2022), it is possible to obtain a more complete and holistic view of the various aspects involved in co-creation. This can lead to valuable insights into how different forms of co-creation can influence specific outcomes, as well as the wider effects on organizations and value creation.

In addition, this joint approach can pave the way for a comparative analysis between the studies, making it possible to identify patterns, similarities and differences in the impacts and outcomes of co-creation. This comparison can provide a deeper understanding of the complex relationships between co-creation, innovation and the results achieved, contributing to a more solid and grounded knowledge base.

Analyzing the relationship between the gap identified in Wang and Miao (2015), which highlights the need to examine different types of innovation and their drivers, and the gap identified in Bu et al. (2022), which emphasizes the importance of considering other influential factors in value co-creation in the context of influence marketing, can provide significant contributions to scientific knowledge.

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The interconnection of these gaps reveals an interdisciplinary and expanded approach to the study of innovation and value co-creation. By considering innovation not only in its traditional dimensions, but also in relation to external factors such as influencer marketing, a window is opened to understand how interactions with different actors and contexts can impact innovation and co-creation processes. This broader perspective can enrich our understanding of how innovation occurs not only internally within organizations, but also in collaboration with external influencers and other stakeholders.

Furthermore, analyzing these gaps together can allow us to identify synergies and interactions between different determinants of innovation and influential factors in the co-creation of value. This can lead to insights into how different types of innovation can be leveraged more effectively through specific co-creation strategies, considering the influence of influencer marketing. This integrated approach can provide practical guidance for firms seeking to promote collaborative innovation and value co-creation in increasingly complex and interconnected environments.

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2 RESEARCH FRAMEWORK AND HYPOTHESES DEVELOPMENT

2.1 INTRODUCTION

Co-creation plays a central role in this study. For a better analysis, co-creation is divided into two variables that are central to the entire study, namely co-creation participation and co-creation experience. Regarding co-creation experience, it is composed of second order factors, namely task enjoyment, autonomy, and competence (Füller et al., 2011). Co-creation participation is more focused on the general aspects of participation, involvement, and relational aspects (Nambisan & Baron, 2009; Zhang et al., 2015).

The factor of co-creation having a centrality characteristic allows for the creation of two research moments. The first moment focused on the antecedents and moderators of co-creation, the second moment focused on the consequences of co-creation.

The importance of a better knowledge of this first part is great because the work developed by most of the participants is voluntary work. Volunteering is considered to be pro-social and pro-educational behavior (Dacko-Pikiewicz & Walancik, 2016), it does not involve financial or material rewards in most situations, and there is the availability of personal time for the benefit of others, but also the search for new knowledge and practices, the feeling of belonging to a certain group of people, social recognition, assistance, and humanism in a more philosophical view. Based on the idea described above, sense of community and platform identification were considered as emotional and motivational factors. On the other hand, innovativeness was considered as a personality factor. Due to their characteristics and relevance, the identified factors were considered as antecedents. The choice of these factors is very much related to the way the involvement and participation in Open-Source Software (OSS) environments happens. The interaction is based on online communities, so it is understood that the sense of community is a preponderant factor because it aggregates people and is an identifying element. Moreover, much of the OSS development activities occur on electronic platforms that are available on the Internet, which is why it is believed that participants need to identify with the platforms to interact with it. Platform identification thus becomes another relevant and highly important factor to consider. Participants by contributing their knowledge, besides seeking solutions to their needs by applying their knowledge and the means they have at their disposal, are also contributing to innovation, improvement in how products and services are delivered. Therefore, it was considered that innovativeness can also play a motivational factor for the contributions and involvement of participants in co-creation environments.

The set of three motivational and personality factors, namely, sense of community, platform identification, and innovativeness, plays an aggregating and converging role that enhances participation, interaction, bonding, and sharing of experiences and knowledge. This is in line with what happens in co-creation environments. Thus, it is believed that these factors predispose participants in co-creation environments to motivate themselves and have behaviors of altruism, involvement, development of relationships between participants, and make them active and collaborative members throughout the process, contributing their best and with all their intellectual potential (Sarkar & Banerjee, 2019).

In a second step, this research aims to study the consequences of co-creation. Focusing on the effects of co-creation, it is observed that active and collaborative participation in co-creation environments leads to direct effects that are perceptible by those involved and those around.

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Participants gain knowledge or find ways that meet their needs and allow them to realize their goals at a lower cost than they are supposed to (Wildavsky, 1972). But they can also gain benefits when there is an improvement of a service or product in which they have contributed suggestions and other means (Porter, 1990; Porter & Kramer, 2002). Especially if there is an increase in effectiveness, speed of making the product or service available, increased reliability, improved ease of use, increased flexibility, improved usability, improved aesthetics, and reduced cost. What ends up being an economic benefit as an effect of co-creation. So, it will be the result of this involvement and be translated as economic benefit, even if the benefit is not effectively monetary and is subjectively determined. Participants can thus recognize the importance of their involvement in co-creation environments and determine the economic value generated by them and how it is expressed, according to their understandings, attitudes, behaviors, and participation models. The perception of value is determined directly by the participant himself. Therefore, co-creation may play a key role in economic sustainability for the participant as they collectively seek and find solutions to their needs in collective environments of cooperation and co-creation is the cog that makes this possible.

Additionally, during the co-creation process there are multiple relational ties that are established between the various participants to achieve goals, share knowledge or perform tasks that need to be done (Kazadi et al., 2016; Vargo et al., 2008). Without each participant losing their identities or their individual value, each participant determines the relational value they will have for each participant they relate to. So, there is a constant cognitive evaluation of the individual participants that varies from person to person. This implies a way of thinking and being individually in relation to those nearby, and collectively related to the community (Kozinets, 1999). Regardless of the criteria that each person will use to make their assessment in relation to their relationships, there will always be implications at the individual psychological and social level (Ho, 1976). This entire evaluation process occurs throughout the co-creation process, so participants will be determining the relational value that each relationship has for themselves and their lives (Vargo et al., 2008). In addition to being able to establish friendship and social relationships those go beyond the online life of the community. Therefore, the relational value determined can be seen as a direct effect of co-creation and preponderant in relationships, both throughout participation in co-creation environments and in personal relationships that last beyond participation.

In co-creation, indirect effects resonate beyond the direct effects (Schnurr, 2017). Mainly, because co-creation can develop feelings of satisfaction that will play a role in channeling emotions and motivating evangelism and will make participants want to be involved in new co-creation experiences again (Mvondo et al., 2022).

2.2 CO-CREATION AND RELATED CONCEPTS

2.2.1 Co-Creation and Co-Production

The SDL approach to marketing emphasizes the active role of the customer in co-creating value with the firm. Customers are seen as co-creators of value, rather than passive recipients of value created by the firm. This approach acknowledges that customers bring their own resources, skills, and knowledge to the table, and that the firm and the customer can collaborate to create value through the exchange of service.

Lovelock and Young (1979) presented the concept of customer participation. The article they wrote helped to document the productivity gains that a firm could make by allowing its customers to participate in consumption and thus take part in the firm's work. They argued

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that allowing customers to participate in the service delivery process could lead to several advantages for the firm, such as increased productivity, improved quality, and reduced costs. The authors also noted that customer participation could have positive effects on the customer, including greater satisfaction and a more enjoyable service experience. This concept of customer participation has been further developed in the SDL perspective, which emphasizes the active role of customers in value co-creation.

Bitner et al. (1997) identified three levels of customer participation in service delivery:

1. Low participation: Customers are passive and receive service in a traditional manner without any active involvement in the process.
2. Moderate participation: Customers have some control and are given options to customize their service experience. They may be required to perform some simple tasks such as filling out forms or providing information.
3. High participation: Customers are actively involved in the service delivery process and may be required to perform complex tasks. They have a significant impact on the outcome of the service and may work together with service providers to co-create the experience.

In this alignment, Toffler (1980) contributed the concept of "prosumer" to describe the emerging trend of consumers becoming producers and taking an active role in creating the products and services they consume. This concept was further developed in the context of co-creation, where customers not only participate in consumption but also collaborate with firms to create value through their input and feedback. Kotler (1986) found customers have become more involved in the production process and have taken on the role of "prosumer." He noted that customers are no longer passive recipients of products and services, but rather they actively participate in the creation of value by providing feedback, co-designing products, and even producing content. This increased level of customer participation has led to a shift in the traditional producer-consumer relationship towards a more collaborative, co-creative relationship.

When reviewing the literature on the subject, it becomes apparent that there is much debate about the terminological relationship between the terms and customer participation. Some scholars use these terms inclusively, employing them interchangeably, while others use them to describe distinct aspects of customer involvement in the service process. The exact meaning of each term can vary depending on the context and the author's perspective. For example, there are several examples of terms as inclusive:

1. the term “customer participation” should be used to encompass “co-production” and “co-creation” (Dong & Sivakumar, 2017);
2. “co-creation” integrates salient aspects of “co-production” (Gebauer et al., 2010);
3. “co-creation” is a general concept for “customer engagement” (Russo-Spena et al., 2012);
4. “co-creation”, “co-production” and “customer involvement” are implicitly synonymous with “customer participation” (Chang & Taylor, 2016);
5. “co-design”, “co-development” and “customer engagement” as terminology for studying “customer participation” (Mustak et al., 2013).

In fact, when Vargo and Lusch (2004a) presented the SDL, they used the terms co-production and co-creation indiscriminately, as the two terms mean the same. However, the high number of terms used interchangeably led to a growing confusion about its conceptual content. Moreover, the indiscriminate use of co-production and co-creation led to criticism. Specifically, that the term co-production is associated with GDL, it implies that something

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must be produced or manufactured, while the term co-creation is more associated with services and is more related to SDL.

In the opinion of Chathoth et al. (2013), co-production is a strategy that emphasizes a focused vision of the firms in relation to the customer's involvement during the production of services, and they considers that the exchange of service between customers and the firm can be seen as a production and consumption platform. Consequently, the same authors considers that the customer has a passive role in a production of service because he/she only receives the benefits of the services that are being provided to him/her. So, customers, firms and stakeholders are involved in co-production during the exchange process (Bitner et al., 1997; Clauß et al., 2014). The co-production can be used to refer to the interactive nature of services because customers are usually physically present to receive the service and are often called on to provide critical information that is necessary for the effective delivery (Yen et al., 2004).

Payne et al. (2008) argue on the other hand that co-production represents a customer-centric view of service production, rather than a firm-centric view. So, according to same authors, co-production represents a shift away from the traditional GDL of service production, as it emphasizes the active participation of customers in the service production process and recognizes the importance of customer involvement in value creation (Prahalad & Ramaswamy, 2004a, 2004b). The traditional view referred to as GDL views services as products that are produced by firms and consumed by customers. It does not emphasize customer involvement in service production, and therefore does not align with the co-production concept. Co-production is not informed by the GDL or a firm-centric view of customer involvement, but rather by the SDL and a collaborative and customer-centered approach to service delivery. The SDL, which informs the co-production concept, emphasizes the co-creation of value through the interaction between service providers and customers. Co-production does not view customers as playing a passive role in value creation; rather, it recognizes the customer's unique knowledge, skills, and resources that can be leveraged to enhance service quality and customer satisfaction. Co-production requires the integration of customer knowledge, skills, and resources into the service delivery process, and emphasizes the importance of customer engagement and participation in service production.

Thus, in the literature, generically, both co-production and co-creation are terms used to refer to customer participation in the creation of value in the context of service delivery. It was recognized that co-creation, participation and co-production belong to the same cluster of meanings, while differentiating customer engagement and innovation as related, however distinct terms (Dong & Sivakumar, 2017)

Co-production generally refers to the joint effort of service providers and customers in producing a service, i.e., it refers more broadly to any customer involvement in the service delivery process. In this context, customers may contribute their own time, skills, and resources to help create value in the service experience. For example, a customer might help design a customized product, provide feedback on service quality, or assist in the delivery of a service.

Co-creation, on the other hand, emphasizes the collaborative and creative aspect of customer participation in service delivery, i.e., it describes the collaborative production of value by customers and firms. It refers to the joint creation of value by service providers and customers through active participation in the design, development, and delivery of a service. In this context, customers are seen as active partners in the value creation process, rather than passive recipients of a service.

Meanwhile, customer participation is often used as a general term that encompasses all forms of customer involvement in the service process, including both co-creation and

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co-production. However, for there to be a reduction in misperceptions, some authors tried to separate the terminology. In the context of co-creation customer participation there is a differentiation between participation in offer creation and participation in value creation (Mustak et al., 2013).

Participation in offer creation refers to the involvement of customers in the development of new product or service ideas, as well as the design and testing of these offerings. This type of participation is focused on generating new ideas and improving the quality of the products or services offered by a firm.

On the other hand, participation in value creation refers to the involvement of customers in the actual delivery and use of a product or service, as well as the co-creation of value through interactions with the firm and other customers. This type of participation is focused on enhancing the overall customer experience and creating value that goes beyond the product or service itself.

By distinguishing between these two types of participation, Mustak et al. (2013) suggest that firms can better understand the specific benefits and challenges associated with each type, and develop strategies to leverage customer participation in ways that best serve their business goals and customer needs.

In this alignment, the related concept of customer engagement should be viewed as an extent to which customers contribute with effort, preference, information, knowledge, or other information to service creation and delivery processes (Auh et al., 2007; Chan et al., 2010; Dong et al., 2014). The concept of customer engagement is important because it highlights the importance of customer involvement in the service creation and delivery process. By actively engaging customers, businesses can gain valuable insights into customer preferences and needs, which can inform the development of new products and services. This can lead to increased customer satisfaction and loyalty.

Customer engagement and co-production are related concepts that emphasize the importance of active customer participation in the creation and delivery of value. By involving customers in the process, businesses can better understand customer needs and preferences, leading to better outcomes for both businesses and customers.

However, in the model of consumer engagement in co-production, value co-creation occurs at the consumption stage, but co-production occurs during the production process before use (Etgar, 2008). The co-production type of engagement occurs before the product or service is consumed; whereas value co-creation refers to the ongoing interaction and collaboration between customers and the firm throughout the entire consumption process, with the goal of jointly creating value that goes beyond the product or service itself. The engagement type of value co-creation takes place during the consumption stage, when customers use and interact with the product or service.

By distinguishing between these two types of engagement, Etgar (2008) suggests that firms can better understand how to engage customers in ways that create value for both the customer and the firm, and tailor their engagement strategies accordingly. For example, firms might focus on co-production to improve operational efficiency and reduce costs, while leveraging value co-creation to enhance customer satisfaction and loyalty.

Through interaction in a joint design process, the customer can become co-designer, co-developer, and co-producer in service provider processes (Grönroos & Ravald, 2011; Grönroos & Voima, 2013), so consumers can develop various roles of participation (Agrawal & Rahman, 2015) while service providers can participate as co-creator of value in customer processes (Grönroos & Ravald, 2011; Grönroos & Voima, 2013).

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On the other hand, Ballantyne and Varey (2006) argue that co-creation is a completely different concept of co-production and that the two terms are not connected. According to their perspective, co-production focuses on the production process, where customers are involved in the creation and delivery of goods and services. In contrast, co-creation focuses on the joint creation of value, where both the customer and the service provider bring unique resources and capabilities to the table.

While co-production emphasizes the importance of customer involvement in the production process, co-creation takes a broader perspective, emphasizing the joint creation of value through collaboration and mutual benefit (Chathoth et al., 2013). Co-creation involves a more equal and reciprocal relationship between the customer and the service provider, where both parties contribute their knowledge, skills, and resources to create value (Baumann & Le Meunier-FitzHugh, 2015). While the two terms are related and both emphasize the importance of customer involvement, they do represent different perspectives and approaches to value creation.

Due to the academia discussion on the topic and the confusion on the terms, Lusch and Vargo (2006) made a revision of the terms and divided the definition of co-creation into two components:

1. the first part is value co-creation - value is not created by the firm and transferred to the customer during the transaction but created jointly by the customer and the firm during the delivery of a service or during the use of a customer product purchased.
2. the second part of co-creation is co-production - seen as the participation of the customer, or any other interested party, in the main offering that occurs when there is joint inventiveness or joint production of related products.

According to Vargo and Lusch (2008a), Vargo and Lusch (2008b), Vargo and Lusch (2008c) co-production refers to customer involvement in the delivery of a service, such as when customers help perform tasks or use self-service technologies. In contrast, co-creation refers to the joint creation of value by the customer and the service provider, where both parties contribute to the design and delivery of the service.

In this sense, co-creation is a broader concept that includes co-production as one of its forms. Co-creation can involve not only customer participation in the delivery of the service, but also their involvement in the design, development, and innovation of the service. Co-creation is seen to enhance customer satisfaction and loyalty, as well as to foster innovation and competitiveness for service providers.

Therefore, while co-production and co-creation share some similarities, they have different meanings and implications for firms in terms of their service strategies and customer engagement practices.

Lusch and Vargo (2006), Vargo and Lusch (2004a), Vargo and Lusch (2008a), Vargo and Lusch (2008b) points to co-production as having the following characteristics:

1. Active participation of customers - Co-production involves the active participation of customers in the service production process, recognizing that customers contribute to the creation of value in the service experience.
2. Integration of customer knowledge, skills, and resources - Co-production requires the integration of customer knowledge, skills, and resources into the service delivery process, and emphasizes the importance of customer engagement and participation in service production.

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3. Collaborative approach - Co-production is a collaborative approach to service delivery, where the customer is seen as an active participant in the value creation process.
4. Customer-centered - Co-production is customer-centered and emphasizes the importance of meeting customer needs and expectations.
5. Continuous exchange of value - Co-production is characterized by a continuous exchange of value between service providers and customers, with each party contributing to the co-creation of value in the service experience.
6. Focus on service quality - Co-production emphasizes the importance of service quality and customer satisfaction and recognizes the role that customer participation plays in enhancing service quality.

From the characteristics' analysis, it becomes clear that there must be customer involvement in co-production and co-creation. The level of participation may vary depending on what customers need to do in each intervention. So, it gives rise to two perspectives that can be seen as different and originate different concepts. Thus, while co-creation and co-production are related concepts, they differ in their focus on value creation, the scope of customer involvement, and the level of customer engagement. Understanding these differences can help businesses to develop strategies that effectively leverage both co-creation and co-production to create value and engage customers.

Co-creation consequently refers to the collaborative process of value creation between firms and customers. In co-creation, the focus is on jointly creating value that meets the needs and preferences of both the firm and the customer. The scope of customer involvement in co-creation can vary, but generally involves input and feedback from customers throughout the design and development process.

Co-creation is centered on consumer and experimentation, so customers are considered partners in the production and development of new products and services (Payne et al., 2008). They are involved in the various phases and actively participate in all of them. They can also customize their service, as well as customize the product sold to them and experience unique experiences in each one. So, customers are intimately connected with the firm. And it gives customers freedom to apply all their creativity, knowledge, skill and competence, as well as expressing their opinions and suggestions that may result in new products or services (Treacy & Wiersema, 1993). There is an intense communication between all actors in the co-creation process. The resulting innovation is the result of intense collaboration between multiple parties.

Co-creation is a broader concept that refers to the collaborative process of creating something new or innovative together, such as a product, service, or experience (Jaakkola et al., 2015). Co-creation involves bringing together different stakeholders, including customers, suppliers, partners, and employees, to generate ideas, share knowledge, and create value through collaboration.

Co-production, on the other hand, refers to the joint production of a service or product by the firm and the customer. In co-production, the customer is involved in the delivery of the service or product and plays an active role in shaping their own experience. The level of customer engagement in co-production is often high, as the customer is directly involved in the delivery of the service or product. Co-production can be understood as a firm-centric view, it is the one that unleashes the production process and defines which production tasks are done by customers as well as the resources they can use.

Co-production typically implies the collaboration between service providers and service users or customers to design and deliver services that meet the needs of both parties

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(Strokosch, 2013). This approach involves both parties working together to co-design and co-deliver services that are more efficient, effective, and responsive to the needs of service users. The innovation created is solely managed by the firm and customers can be seen as mere employees who produce work that was originally firm responsibility. However, customer involvement is much more necessary in the product and service development phase than in the other phases, but this does not invalidate that in other phases it is not relevant. The communication that is made from the firm to the customers is oriented to the teaching of how they can enjoy the service that the firm provides or the product it sells (Lundkvist & Yakhlef, 2004). Reverse communication is oriented towards certain aspects that the firm considers relevant to improve its products and services.

Table 9 and Table 10 show aspects that help differentiate co-creation and co-production, and key differences between them, to better understand both terms.

Table 9. Co-Production vs Co-Creation

Co-Production	Co-Creation
The customer participates in the development or service delivery and the value created is shared between him and the firm (Terblanche, 2014)	The consumer is intimately connected with consumption and the value-in-use, and value of the service can only be determined by the customer (Lusch et al., 2007), making each co-creation experience unique for each customer (Prahalad & Ramaswamy, 2004a)
The role of the customer is relatively passive (Chathoth et al., 2013)	Customers are considered active partners in the production and service process (Prahalad & Ramaswamy, 2000, 2004a)
Customers participation is required in development phase for the firm to meet the needs of the market (Oertzen et al., 2018)	The customer contribution serves as an operational resource, it contributes knowledge, skills, experience, capacity and time, so the customer plays an important role in creating and delivering new services (Agrawal & Rahman, 2015; Prahalad & Ramaswamy, 2000; Vargo & Lusch, 2008b)
Co-production is firm-centered (Chathoth et al., 2013; Payne et al., 2008) and the entire process of producing a service is driven by a firm's set of features and abilities, so the customer is viewed as an employee (Lovelock & Young, 1979)	Co-creation is customer- and experience-centric, so firms look at their customers as partners in creating personalized experiences that add value and they interact with their own resources in the service process to complete it (Verleye, 2015)
Firms drive the innovation that occurs in their products and services (Chathoth et al., 2013; Lovelock & Young, 1979)	Customers engage creatively and constructively with the world around them, along with the primary co-creator of the consumer experience, with the freedom to form opinions and suggestions that can contribute to the success of new products or services on terms of functional characteristics and market access (Martinez-Cañas et al., 2016)
The communication that is established and oriented to teach the customer how to use the service or product they will enjoy, but only prioritize the feedback regarding aspects that the firm considers relevant (Bacile et al., 2014)	Co-creation is built on constant and intensive dialogue with customers, operators, service and stakeholders and a variety of other partners (Gustafsson et al., 2012; Prahalad & Ramaswamy, 2004b)

Source: Own elaboration

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Table 10. Difference between Co-Creation and Co-Production

	Co-creation	Co-Production
Definition	Co-creation emphasizes collaboration and joint value creation between the business and the customer.	Co-production emphasizes joint production of goods or services by the business and the customer without contribution from the participants and personalization.
Purpose	Co-creation involves collaboration between service providers, often in the public sector, and the end-users of those services, such as citizens or patients.	Co-production aims to improve the quality, efficiency, and effectiveness of public services, making them more responsive to citizens' needs and potentially reducing costs.
Customer role	In co-creation, the customer plays an active role in the value creation process.	In co-production, the customer typically has a more active role in the production process and a passive role in the value creation process.
Scope of involvement	Co-creation typically involves the customer in a broader range of activities than co-production, including ideation, design, and innovation.	Co-production is often more focused on the operational or functional aspects of production.
Participation	Co-creation typically involves a collaboration between businesses and customers. Firms seek input and involvement from customers to improve products, services, or experiences.	Co-production involves collaboration between service providers, often in the public sector, and the end-users of those services, such as citizens or patients.
Emphasis on customer engagement	Co-creation places a strong emphasis on customer engagement and interaction throughout the value creation process.	Co-production tends to focus more on efficiency and productivity in the production process.
Type of output	Co-creation can lead to the development of new products or services.	Co-production typically results in the production of existing products or services defined by the producer.
Value creation	Co-creation is more focused on creating value for the customer and the business.	Co-production is more focused on creating operational efficiencies and reducing costs to the produces.

Source: Own elaboration

In summary, co-production and co-creation are two related but distinct concepts that are often used in different contexts. Co-production focuses on improving service delivery by involving service users in the design and delivery process, while co-creation focuses on generating new ideas and creating value through collaborative innovation.

2.2.2 Co-Creation Experience and Co-Creation Participation

For this thesis, two constructs will be considered, co-creation participation and co-creation experience, as they are important to consider when studying co-creation in the context of innovation and collaboration.

Co-creation participation in this investigation refers to the extent to which customers and other stakeholders are actively involved in the innovation process. This can include activities

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such as idea generation, product design, testing, and feedback. In extent, co-creation participation refers to the active participation of the customer by getting involved in the process of providing a service or in the process of producing a product, in which he applies his effort, time or resources in which he can adequately manage the level of participation with the objective of his actions being able to affect the specifics of the service or final product, in which benefits are produced for him, for the firm, or for all participants (Ernst et al., 2017; Hoyer et al., 2010).

Co-creation experience, on the other hand, refers to the quality of the experience that participants have during the co-creation process. This can include factors such as communication, collaboration, and the level of engagement and satisfaction that participants feel. In extent, co-creation experience is the quality of the experience consumers have when freely and willingly engaging in activities performed in various creative tasks that encourages them to continue and motivates them to do their best to create value, between themselves and the firm, through interaction, by sharing their knowledge, experience and competence in order to address the special needs that are identified (Azevedo et al., 2009; Nurgraha & Siddiq, 2022; Zhang et al., 2015).

In the realm of co-creation, the intricate experience is made up of three intertwined sub-dimensions: competence, autonomy, and enjoyment. These dimensions collectively serve as a comprehensive framework for assessing and understanding the nuances of the co-creation process.

Competence, the first sub-dimension, focuses on the participants' perception of their ability and expertise within the intricate tapestry of co-creation. It encompasses not only technical proficiency, but also the cognitive insights and practical knowledge that participants bring to the collaborative effort. This sub-dimension thrives on the feeling of power derived from effective action and interaction in the context of co-creation. It transcends the mere application of acquired knowledge, encompassing social dynamics, behavioral components, attitudes, emotions, values and motivations that contribute to innovative problem solving (Clinton & Hattie, 2021; Dahl & Moreau, 2007; Earley, 2002; Earley & Peterson, 2004; Füller et al., 2011).

Autonomy, the second sub-dimension, emerges as a cornerstone of the co-creation experience. It signifies the participants' agency in defining the direction and outcome of the collaborative process. Autonomy empowers individuals to make choices, exercise control and direct their actions and decisions in a way that matches their personal values and aspirations. In the context of co-creation, autonomy increases intrinsic motivation by aligning activities with participants' interests, thus promoting involvement and commitment (Dahl & Moreau, 2007; Füller et al., 2011; Iso-Ahola, 2022; Laaser & Bolton, 2021). The significance of this sub-dimension goes beyond the realm of co-creation, intertwining into the fabric of personal agency and self-determination that feed motivation in various spheres of life.

Enjoyment, the third sub-dimension, introduces an emotional and hedonic dimension to co-creation experience. It encompasses the joy, satisfaction, and positive emotions that participants feel when they engage in the collaborative process. Beyond a mere emotional state, pleasure incorporates the gratification derived from contributing to an activity, an act or a situation that triggers positive affect (Baumeister et al., 2013; Dahl & Moreau, 2007; Fisher, 2010; Haji et al., 2021). This sub-dimension goes beyond momentary enjoyment; it acts as a predictor of behavior and a regulator of performance effects, influencing participants' motivation, cognitive processing and sustained engagement (Ruiz & Robazza, 2020; Seo et al., 2004; Tamir & Mauss, 2011).

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By synthesizing these sub-dimensions, a multi-faceted understanding of the factors that contribute to a positive co-creation experience emerges. Competence underlines the depth of participants' involvement; autonomy gives them the power to shape their journey and enjoyment infuses it with positive emotions and lasting satisfaction. This triadic framework, anchored in competence, autonomy and enjoyment, is deeply intertwined with the domain of motivation, as highlighted by several studies (Birk & Mandryk, 2013; Guay et al., 2010).

The holistic co-creation experience encompasses the intricate interplay between competence, autonomy, and enjoyment. This nexus not only defines the quality of the collaborative process, but also serves as a compass to promote motivation and commitment. By cultivating participants' competence, providing autonomy, and creating avenues for enjoyment, the journey of co-creation gains depth and resonance, creating a virtuous cycle of motivation and satisfaction.

By examining both co-creation participation and co-creation experience, a more comprehensive understanding can be attained regarding the pivotal role of co-creation in driving innovation and fostering growth within firms.

Co-creation experience and co-creation participation are closely related concepts. The co-creation experience is focused on the psychological part of the individual and focuses on his/her knowledge, more specifically, on his/her skills and autonomy, as well as on his/her ability to obtain enjoyment (Bhatti et al., 2020; Ranjan & Read, 2019). Co-creation participation, on the other hand, is related to the behavioral aspect of individuals, as it involves their active involvement in the co-creation process (Palma et al., 2018; Roberts et al., 2021). This participation involves activities such as generating ideas, providing feedback, testing prototypes, and collaborating with other participants, among others.

Therefore, the co-creation experience can influence co-creation participation, as a positive experience can lead to increased participation. Customers who have a positive co-creation experience may be more likely to participate in co-creation activities. A positive co-creation experience can foster a sense of trust and commitment towards the organization, as well as a belief that their input and feedback are valued and appreciated. This can lead to increased willingness to participate in co-creation activities, and a stronger sense of connection and engagement with the organization.

Co-creation experience has a significant impact on customers when they are part of the process of providing a service or using a good (Füller et al., 2011). When customers are given the opportunity to co-create a service or product, they become more engaged in the process and feel a greater sense of ownership and investment in the outcome. This can lead to increased satisfaction with the final product or service, as well as a stronger sense of loyalty and advocacy towards the organization.

Additionally, co-creation experience can help to build stronger relationships between customers and organizations. By involving customers in the co-creation process, organizations can demonstrate a commitment to listening to and valuing customer input and feedback. The co-creation experience can help to foster a sense of collaboration and mutual respect between the organization and its customers. This can help to build trust and foster a stronger sense of connection and loyalty among customers.

The co-creation experience can create a positive psychological state in individuals, such as enjoyment, satisfaction, and sense of ownership, which can enhance their motivation to participate actively in co-creation activities. This, in turn, can increase their willingness to share their knowledge and skills, contribute ideas, and collaborate with other participants, leading to more valuable outcomes for all stakeholders involved.

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Thus, a positive co-creation experience can increase participants' willingness to continue participating and putting effort into co-creation activities. When participants have a positive experience, they are more likely to feel satisfied with the process and outcomes of co-creation and to feel a sense of ownership and investment in the project. This can lead to increased motivation to continue participating and contributing to the co-creation activities, as well as to the sustainability of the co-creation project over time. On the other hand, a negative co-creation experience can lead to disengagement, decreased motivation, and reduced participation in co-creation activities.

Several previous studies have shown that co-creation experience can influence co-creation participation (Bhatti et al., 2020; Delpechitre et al., 2018; Dong & Sivakumar, 2017; Hussain et al., 2020; Kozinets et al., 2021; Moghadamzadeh et al., 2020; Nurgraha & Siddiq, 2022). Therefore, co-creation experience plays a fundamental and decisive role because it is the one that predisposes customers to share knowledge and be receptive to new knowledge (Ind et al., 2019). Co-creation as an organizational model, in order to better understand customers, implies that the experience that customers have is reflected in participation (Moghadamzadeh et al., 2020; Roberts et al., 2021).

H1: Co-creation experience is positively related to co-creation participation.

2.3 CO-CREATION ANTECEDENTS AND MODERATORS

The emergence of digital platforms and online communities has enabled consumers to participate in the value creation process of firms and brands in new ways. Through social media, online forums, and other digital channels, consumers can now share their feedback, opinions, and experiences with others, and with the firms and brands themselves.

In the first model intend to study the components that can be considered as antecedents of co-creation and motivators for users to engage in co-creation activities in an active, participative, and altruistic way. A better understanding of this part is of great importance because the work done by most participants is voluntary work.

The three motivational and personality factors - sense of community, platform identification, and innovativeness - can predispose participants in co-creation environments to be motivated and exhibit behaviors of altruism, involvement, relationship-building, and collaboration. Moreover, understanding the moderation effects of these antecedent factors can help researchers and practitioners design and manage co-creation environments that cater to a diverse range of motivations and preferences. It can help identify key factors that influence participation and engagement and inform the development of effective strategies to promote co-creation and innovation. It can also help identify strategies to increase participation and engagement among individuals who may have different levels of sense of community, platform identification, or innovativeness.

2.3.1 Sense of Community

Shared values, ideologies, and culture can certainly play a role in bringing people together and creating a sense of shared identity and purpose. Thus, a community is a group of people who share the same values, ideologies and culture (McMillan & Chavis, 1986; Tajfel & Turner, 1986). For example, a community of people who share a particular cultural background or religious belief might come together to celebrate their traditions and support each other in various ways.

However, it's important to remember that communities can also form around a wide variety of other shared interests, such as hobbies, professions, political views, or social

causes. While shared values, ideologies, and culture can be important aspects of a community, it's important to note that these factors alone do not define a community. Despite the nature of the communities (business, humanitarian causes, virtual communities, etc.) there is a creation of strong mutual bonds among the members, which in some ways may resemble those of a benevolent family (Muniz & O'Guinn, 2001). A community is a group of people who come together around a shared interest, goal, or activity, and who have a sense of belonging and mutual support. The defining characteristic of a community is the sense of connection and mutual support that exists among its members. In summary, what define a community is not necessarily the specific values or culture shared by its members, but rather the sense of belonging, support, and shared purpose that is fostered within the group.

Lately, it has become easier for communities to form and interact with each other even if they are not geographically close. Communities that are not geographically close do their development in the virtual world. Thus, the communication between the community and its members is supported by the Internet. This has given rise to what is known as virtual communities, which are groups of people who interact with each other primarily through digital means such as online forums, social media platforms, video conferencing, and other online tools.

Members of these communities can communicate and collaborate with each other regardless of their physical location, and they can share information, ideas, and resources with ease. The development of virtual communities has had a significant impact on the way people interact and form social connections. It has made it possible for people to find and connect with others who share their interests and values, even if they live in different parts of the world, since virtual communities can be based on a variety of shared interests or activities, such as hobbies, professions, cultural or religious affiliations, or common causes. It has also provided opportunities for people to collaborate on projects and initiatives that might not have been possible otherwise.

In opinion of Prahalad and Ramaswamy (2000), the relevance of the Internet has become a facilitator of direct contact between producers and consumers. The Internet has enabled producers and consumers to directly interact and collaborate with each other, bypassing traditional intermediaries such as distributors and retailers. Moreover, the Internet has played a pivotal role in fostering the co-creation of value, acting as a conduit for collaboration between producers and consumers. This transformative model entails active consumer engagement not only in product and service design but also in their developmental processes and even the final stages of delivery. Such contributions that are acknowledged as valuable serve to not only enhance the quality of offerings but also to galvanize community involvement and amplify social utility (Bock et al., 2005; Casaló et al., 2010; Kwon & Wen, 2010). Through the combined efforts of community members, a collective approach emerges where individuals work together to create and co-create value for both themselves and any involved organizations, exemplifying the broader benefits of co-creation for the entire community, as suggested by Brodie et al. (2013). Notably, virtual customer communities have arisen as central enablers of the co-creation paradigm, garnering significant attention from scholars and society alike. Their ability to influence the products and services brought to market has not only intrigued academics but has also captivated the interest of broader society (Lorenzo-Romero et al., 2014; Romero & Molina, 2011).

Virtual customer communities represent digital platforms where individuals can converge to exchange their experiences, viewpoints, and innovative ideas pertaining to a specific product or service. Within these online communities, users seamlessly amalgamate their operational resources, encompassing information, skills, knowledge, relationships, and shared

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cultural nuances, as they engage in collaborative interactions. This amalgamation of resources serves as the crucible for co-creating value not only for the firms providing the products or services but also for the users themselves and fellow customers. This value creation transpires through the dynamic processes of information sharing, knowledge acquisition from users possessing unique insights, the cultivation of responsible consumer behavior, and the establishment of meaningful interpersonal connections (Yi & Gong, 2013; Yi et al., 2013).

Within virtual communities, the geographical locations of their members take a backseat in terms of significance, primarily due to the robust support provided by internet-based social networks and other advanced technological communication platforms, as noted by Porter (2006). These digital enclaves function in a manner akin to conventional communities, where people interact directly with each other. However, in the virtual realm, individuals are brought together by shared interests, objectives, or passions, rather than physical proximity.

Virtual communities are intricate networks of individuals who form meaningful relationships and collaborate collectively to achieve a diverse array of goals, often defined and shaped by the community itself. Scholars like Baruah (2012), Porter (2006), Blanchard and Markus (2004), Fernandes and Remelhe (2016) and Ridings et al. (2006) have explored this dynamic. The essence of these virtual communities lies in the coalescence of individuals, united by common objectives, and striving to maintain the vitality of their relationships.

In this virtual realm, the dynamics of relationships are predominantly fueled by digital interactions. Members actively engage with one another, share insights, and jointly work towards their communal goals. Nevertheless, it's worth noting that, as highlighted by Blanchard and Markus (2004), virtual relationships are occasionally complemented by in-person encounters, illustrating the versatility and adaptability of these communities. Whether through purely digital exchanges or face-to-face meetings, these communities exhibit a resilient and evolving nature that transcends geographical boundaries, making them a compelling sociological phenomenon in our interconnected world.

Through the exchange of information and knowledge, users embark on a journey of discovery, gaining fresh insights, acquiring new skills, and enhancing their ability to make informed decisions regarding products, services, or subjects of personal interest. This knowledge-sharing process manifests in a myriad of forms, encompassing online tutorials, reviews, recommendations, and spirited discussions, all facilitated through diverse communication channels such as social media, online communities, and open-source software.

Moreover, the act of sharing information and knowledge transcends mere individual enlightenment. It serves as a catalyst for collaboration and co-creation, uniting users in their pursuit of shared objectives. This collaborative synergy empowers them to collectively labor toward common goals and co-develop novel products and services meticulously tailored to meet their specific needs and preferences. This paradigm of collaborative innovation stands as a defining characteristic of online communities, heralding the emergence of innovative models of value creation that are acutely attuned to the ever-evolving requirements and tastes of users.

In essence, this reciprocal exchange not only enriches individual experiences but engenders a fertile ground for the birth of transformative ideas and solutions. It underscores the potential of online communities as hubs of dynamic interaction, where the collective wisdom of the crowd drives innovation and contributes to the cultivation of value propositions that are finely tuned to the desires and demands of users. So firms that have platforms to interact with people to constantly share their operational resources, such as information and expertise, and express their opinions on various topics, are looking back for

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ideas and suggestions and collaboration for improving their products and services (Constantinides et al., 2008; Hajli, Sims, et al., 2017; Lorenzo-Romero et al., 2014). Establishing and maintaining interactions with other users and the firm provides intimacy, social support and friendship among platform users (Bagozzi & Dholakia, 2006; Dholakia et al., 2004), what influences feedback, advocacy, help and tolerance (Galbreath, 2009; Yi & Gong, 2013).

In virtual communities there is exchange of information, discussion of past experiences, the benefit of developing new products and services that enhance and address the needs and problems of the community (Baruah, 2012; Fernandes & Remelhe, 2016). Thus, responsible behavior is expected from users, both as members of certain groups and as resource integrators, with full knowledge of their obligations and responsibilities (Constantinides et al., 2008; Galbreath, 2009; Yi & Gong, 2013). Because they are associated with online communities, users are aware that they can express opinions and share relevant information (Baron & Harris, 2008; Kim et al., 2007; Whiting & Williams, 2013). By adhering to these norms and taking responsibility for their actions, users can contribute to the sustainability and success of the platform and the community.

It should be noted that in many cases, when an individual joins a virtual community, he or she is generally unfamiliar with the environment, other members and rules of conduct, having few social ties and little commitment to the community but wanting to integrate and to participate, and as new members gradually begin to interact, they learn how to participate in social interactions, so initial hits are for gaining knowledge and obtaining information (Tseng & Kuo, 2014). Over time, this lack of knowledge is overcome and the individual begins to feel more confident in exchanging information, and the participation becomes more regular and the person spends more time in the community, becoming a full member in some cases (Langerak et al., 2004; Tseng & Kuo, 2014).

The process of becoming a full member of a community is often referred to as socialization, where individuals learn and internalize the norms and practices of the community and develop a sense of belonging and identification with the community. Socialization can be both explicit (such as when someone explicitly tries to persuade another person to adopt a particular behavior or belief) or implicit (such as when someone unconsciously adopts the behaviors or beliefs of those around them). Given that people are adaptable, they are led to adapt attitudes, behaviors and beliefs in their social context (Bang et al., 2000; Salancik & Pfeffer, 1978). As well, they adopt information, values, norms and expectations provided by other entities that in social environments guide people's behaviors (Bang et al., 2000; Glomb & Liao, 2003).

Effective social interaction stands as a cornerstone within virtual communities. This is particularly significant because it serves as the bedrock upon which members establish relationships, offer invaluable emotional support, and join forces to collaborate on diverse projects or initiatives. The impact of social interaction extends beyond individual connections, as it nurtures a sense of belonging and interconnectivity among community members, thereby elevating their engagement and participation within the community.

This profound feeling of community is often cultivated through the collaborative nature of the development process and the availability of open communication channels, which encourage active contributions from all participants. Consequently, virtual communities that emphasize interaction and community-building play a pivotal role in fostering a sense of belonging among users. This sense of belonging, in turn, leads to a host of positive outcomes.

Users who perceive themselves as integral parts of the community and the broader organization are more inclined to provide valuable feedback and innovative suggestions for

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improvement. They become fervent advocates for the community, spreading the word and attracting new members. Furthermore, they readily extend a helping hand to offer support and guidance to fellow users. In this way, the virtuous cycle of social interaction, community-building, and user engagement creates a thriving ecosystem where each member finds meaning, purpose, and a sense of connectedness, benefiting both the individual and the community as a whole.

Sense of community refer to a sense that members have of belonging, a feeling that members are important to each other and to the group, and a shared faith that members' needs will be met through a commitment to being together (McMillan & Chavis, 1986), because there is a recognition of interdependence through a network of functional relationships, as mutual support and accessible even when social changes occur that favor individual well-being and individual social quality of life. Thus, sense of community applies to the feeling of belonging to a group of people who share similar interests and values.

Studies of human behavior over the years have argued that there is a theory of social identity, based on which individuals identify with each other and create a sense of social identity that often leads individuals to integrate communities (McMillan & Chavis, 1986; Stets & Burke, 2000; Tajfel & Turner, 1986). These social categories allow individuals to categorize others and themselves, which in turn creates a sense of belonging. The theory also suggests that individuals strive to maintain a positive social identity by enhancing the status of the social categories they belong to and by seeking to positively distinguish their group from other groups. This can lead to the formation of in-groups and out-groups, and in some cases, can lead to intergroup conflicts. Overall, the theory of social identity highlights the importance of social connections and group membership in shaping individual behavior and attitudes.

In this context, the theory of belonging to a community is characterized by feelings that are associated with a group identity and a desired differentiation from other groups that are external to the communities to which they are linked (McMillan & Chavis, 1986; Tajfel & Turner, 1986). As recognition of individuals as a member of the community cannot be based on abstract concepts that organizations define, one must take into account the sentimental identification that each community creates around them and which leads individuals to identify with it (Brown & Duguid, 1991). McMillan and Chavis (1986) have identified principles that categorize a sense of community:

- Membership - A sense of belonging to a group, which involves having shared experiences, goals, and interests with other members.
- Influence - The ability to impact the group and be influenced by it. This includes having a say in decision-making processes and being able to contribute to the community in a meaningful way.
- Integration and fulfillment of needs - A sense that the community provides something of value to its members, whether it be social support, information, or other resources. Members should feel that their needs are being met and that they are gaining something from their participation in the community.
- Shared emotional connection - A sense of attachment and shared emotional connection among members of the community. Members should feel a sense of loyalty and commitment to the community and its goals and should be willing to invest time and effort into maintaining and enhancing it.

Whether a community is geographically close or exists primarily in the virtual world, the core elements of community development remain the same. These elements include a sense of shared purpose and goals, membership, influence, integration, and satisfaction of needs, and

shared emotional connections. In both physical and virtual communities, people come together around a common interest or goal, and they work together to achieve that goal. This shared purpose creates a sense of identity and belonging, which is essential for building strong communities. Membership in a community is also important, whether it is physical or virtual. Members of a community share common values, interests, and goals, and they support each other in achieving these goals. Integration and satisfaction of needs are also important for community development. Members need to feel that their needs are being met and that they are included in the community. In virtual co-creation communities, in fact, social and interpersonal benefits, as well as peer recognition and status within a community, can be relevant incentives for participation and spend their time (Brodie et al., 2011; Brodie et al., 2013). Another important aspect of community development is shared emotional connection, whether it is physical or virtual. Members of a community need to feel a sense of connection and empathy with each other to build strong relationships and support each other through difficult times. This emotional connection is what makes a community feel like a true community, rather than just a collection of individuals. Finally, influence is another important aspect of community development. In both physical and virtual communities, members could influence the direction and actions of the community. This can be through active participation, leadership roles, or simply by contributing ideas and feedback.

Interpersonal influence is a fundamental aspect of social interaction and can have a significant impact on the attitudes, behaviors, and decisions of individuals in various environments. In online communities, interpersonal influence occurs, users can influence each other (Yi et al., 2013). The degree of influence can vary depending on factors such as the credibility, expertise, and popularity of the users involved, as well as the context and social norms of the virtual platform. Interpersonal influence is a significant aspect of social media marketing, as firms aim to leverage the power of user-generated content and peer-to-peer recommendations to enhance their brand image and increase customer engagement.

Informational influence should be understood as an influence to accept information obtained from others based on evidence about the reality experienced by others (Deutsch & Gerard, 1955), this influence occurs through information exchange, i.e., search and share information (Yi et al., 2013). Thus, informational influence occurs when individuals seek out and rely on the opinions, knowledge, or expertise of others to make decisions or form attitudes; users may be more likely to trust and follow the advice of those they perceive as credible and knowledgeable. Normative influence should be understood as a pressure to conform to the positive expectations of others (Deutsch & Gerard, 1955), so it mainly refers to personal interaction and manifestations as responsible behavior (Yi et al., 2013). Normative influence, thus, occurs when individuals conform to the social norms or expectations of a particular group or community. Informational and normative influence can be found everywhere and in any environment (Bearden et al., 1989), including virtual platforms, physical communities, and social interactions. For example, informational influence can be seen in online product reviews; whereas normative influence can be seen in the way users conform to the expectations of the group by adopting similar language, values, or behaviors, which can affect their perceptions of others and their willingness to participate in the community.

The sense of community is evident in the social interaction that takes place within virtual communities. By building relationships with other members, offering emotional support, and collaborating on projects or initiatives, individuals in the community can create a sense of belonging and connectedness. When customers feel like they are part of a community, they feel a sense of connectedness with others who share their interests or experiences. This feeling

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of community is reinforced by the positive and supportive environment that social interaction can help create, leading to increased engagement and participation from members. While the sense of community that members feel is a result of the dynamics that occur in the group (Bouncken et al., 2020; Tyler et al., 1996), this can be a motivation to explain what energizes members' behavior and what guides actions (Nambisan, 2002; Nambisan & Baron, 2009).

This sense of connection to others is essential for human beings as social creatures, and it can bring about many benefits to individuals, such as increased feelings of security, belongingness, and support. This sense of community can influence user behaviors such as feedback, advocacy, help, and tolerance. Thus, sense of community can motivate individuals to participate in co-creation projects, as they feel a sense of responsibility and ownership towards the project. When individuals feel a sense of community in a co-creation environment, they are more likely to interact with others and share their experiences and knowledge. Users who feel valued and supported by the community and the firm may be more willing to engage with others who have different backgrounds, perspectives, and opinions. This can lead to a more diverse and vibrant community, where users can learn from each other and exchange ideas in a constructive and respectful manner. This can lead to increased collaboration and the exchange of ideas, which can ultimately lead to the development of better outcomes.

Sense of community is considered a key factor to explain the co-creation experience as it fosters a shared sense of purpose and identity among participants. A sense of community is a sharing of the same values, ideologies and culture (McMillan & Chavis, 1986; Tajfel & Turner, 1986) related on an emotional level to the co-creation experience and co-creation participation (Füller, 2010; Füller et al., 2011; Goyal & Akhilesh, 2007). Studies have shown that a strong sense of community can positively impact the co-creation experience by promoting trust, mutual respect, and social support among participants (Nadeem et al., 2020). Therefore, it is very likely that the greater the involvement of members in community activities, the greater the emotional connection that will exist (Mavri et al., 2021; White et al., 2019). Additionally, a sense of community can create a social support system, which can help members overcome challenges and obstacles during the co-creation process (Füller et al., 2011). Thus, a sense of community can create a supportive and collaborative environment that facilitates co-creation activities and enhances the overall co-creation experience (Mavri et al., 2021; White et al., 2019). Thus, a sense of community can help to create a positive emotional experience for participants, which can further enhance their willingness to contribute to the co-creation process.

By fostering a sense of community, brands can create a space where customers feel valued and connected, and where they can share feedback and ideas that can help improve the product or service. When users feel that their contributions and feedback are valued by the community, they are more likely to engage in co-creation activities with enthusiasm and creativity. The sense of community that people feel when they are collaborating makes the set of associated feelings grow (Muniz & O'Guinn, 2001). Collaboration can create a sense of achievement and satisfaction, as participants work together to accomplish a shared goal or complete a project. This can lead to a feeling of pride and accomplishment. This sense of being heard and valued also enhances the enjoyment of the co-creation experience and motivates users to continue actively participating in shaping the platform's content, features, and community. Additionally, collaboration can lead to a greater sense of connection and empathy with others, as participants work together to overcome challenges and solve problems. This can create a shared sense of experience and understanding, which can foster feelings of closeness and emotional support. Hence, this sense of community can provide

emotional support and a feeling of belonging, which can enhance their overall satisfaction with the product or service. Thus, the sense of community which can lead to positive emotions and feelings among the participants helps to build a positive relationship between the customer and the brand, creating a sense of loyalty and trust that can lead to long-term relationships.

H2: Sense of community is positively related to co-creation experience.

The concepts of sense of community and co-creation participation are closely related. Co-creation refers to a process where individuals or groups collaborate in the creation, design, or development of a product, service, or experience. When individuals participate in co-creation, they could express their ideas and contribute to the outcome. Being part of a community provides opportunities for individuals to engage in altruistic behaviors, which can promote well-being and personal growth. A sense of community is an important factor in people's social interaction because it is likely to increase the likelihood that community members will share information, show understanding and concern for the mutual needs of the community (Boyd et al., 2017; Rovai, 2002). Thus, sense of community can have a significant impact on individuals' emotional and psychological well-being, as well as on their sense of social responsibility and engagement with others.

The sense of community can be a strong influence of behavior, particularly when it comes to participation in co-creation environments. When individuals feel a sense of belonging and connection to a community, they are more likely to communicate and collaborate with others. They may be more willing to share information about their own experiences and needs, as well as to listen to and understand the experiences and needs of others. Thus, when this sense of community is strong, members are more likely to be motivated to participate in the co-creation process, and to work collaboratively towards a common goal; this can lead to greater levels of engagement and involvement.

When individuals feel a sense of belonging to a community and have a shared purpose, they are more likely to be motivated to participate in co-creation activities. When people feel that they are part of a community, they are more likely to contribute to the greater good of the group, because of a sense of purpose and meaning in their lives. Members of a community know the importance that each one has in the community and understand the roles that each one has to play (Brodie et al., 2013; Dholakia et al., 2004; Gram et al., 2019; Kaur et al., 2020). This understanding of roles and importance can lead to a greater sense of responsibility and commitment to the community and its goals, including co-creation activities. Members may also feel that their contributions are valued and important to the community, which can increase their motivation to participate in co-creation activities and put in effort to achieve collective goals (Füller, 2010; Füller et al., 2011; Goyal & Akhilesh, 2007).

Moreover, sense of community can also facilitate co-creation participation by providing a supportive environment where individuals feel comfortable expressing their ideas and collaborating with others. Additionally, the sense of community can foster a sense of trust and mutual respect among participants; hence, individuals can feel more comfortable expressing their ideas and collaborating with others. Thus, the fostering of a sense of community removes psychological barriers that prevent people from acting and participating as creators of the personal experiences of the services they enjoy (C. Köbis et al., 2020; Delpechitre et al., 2018; Hsieh et al., 2022).

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Finally, when people feel a sense of belonging to a group, they are more likely to continue their involvement and engagement with the community. This is because a sense of

belonging creates a positive reinforcement loop, in which members feel valued and supported within the community, which motivates them to continue their involvement. Sense of belonging to the group is positively reinforced and members are motivated to maintain their involvement with the community (Amichai-Hamburger et al., 2016; Chang et al., 2020; Peacock & Cowan, 2019)

Therefore, the sense of community is a strong behavioral influencer by stimulating community members to actively participate in co-creation environments (Rodríguez-López, 2021; Rubio et al., 2020; Shirazi et al., 2021). In this line, studies have shown that when users feel a sense of community and emotional connection with other members, they are more likely to actively participate, contribute and collaborate in the co-creation process (Black & Veloutsou, 2017; Burmann et al., 2017; Muniz & O'Guinn, 2001).

H3: Sense of community is positively related to co-creation participation.

A sense of community within co-creation environments harbors the potential to wield a significant and moderating influence on the intricate relationship between co-creation experience and co-creation participation. This hypothesis posits that the sense of community, as a pervasive contextual factor, substantially shapes how individuals engage with and contribute to the intricate realm of co-creation endeavors. This supposition is substantiated by a myriad of theoretical underpinnings and empirical research, collectively illuminating the multifaceted dynamics that underscore this phenomenon.

A closer look at the interaction of sense of community as a moderator and its influence on the dynamics of co-creation reveals an intricate web of influences that not only shape the co-creation experience, but also impact the participants' ongoing willingness to actively engage. This factor, as highlighted by Priharsari and Abedin (2021), transcends the mere definition of an isolated component, assuming a central role in regulating the relationship between collective experience and persistent participation in co-creation.

When examining the elements that make up the sense of community as a moderator (Priharsari & Abedin, 2021) - shared goals, mutual trust and collective identity - these are not just distinct traits, but the basis of a structure that profoundly influences the participants' self-image in the context of co-creation. This moderator acts as a catalyst, not only encouraging connections and relationships, but also shaping the participants' perception of their fundamental role as contributors within a wider community, thus impacting their experience and participation in co-creation environments.

The moderation carried out by sense of community goes beyond a superficial influence on participation; it permeates the essence of the co-creation experience. Within this enabling environment, participants see themselves not just as isolated collaborators, but as essential members of an interconnected community. This perception is crucial, as it transcends simple participation and infuses a depth of meaning into the individual contribution, creating an environment conducive to the effectiveness and quality of collaborative initiatives.

Synergistic interaction, facilitated by the sense of community moderator, not only strengthens the bonds between community members, but also enriches co-creation by creating a supportive environment. This environment not only nurtures participants' intrinsic motivation, but also raises commitment to a level where individual contribution is perceived as integral to collective success. Continuous participation, therefore, is not only a natural extension of the co-creation experience, but a tangible expression of sustained commitment and recognition of the importance of the individual contribution in the context of the collective.

The importance of the sense of community moderator is highlighted and suggested in empirical studies, such as those conducted by Wang and Fesenmaier (2003), Xu and Li (2015), Chua et al. (2008) and Kohler et al. (2011). These studies not only validate the positive influence of this factor as a moderator in the co-creation experience, but also highlight its crucial role as a regulator in the relationship between the experience lived and continued participation.

Thus, participants with a strong sense of community show greater involvement in the community and a more significant interest in its success than those who are less involved. Thus, participants with a greater sense of community should respond more actively and positively to a perceived positive co-creation experience, since their relationship with participation in co-creation is more dependent on the meaning they attach to this participation, resulting from a greater interest in the community. On the other hand, participants with a low sense of community have lower motivation and consequently may lack the drive and engagement to participate, even if the co-creation experience is positive. Therefore, the relationship between the co-creation experience and participation in co-creation may be less positive among customers with a lower sense of community.

H4: Sense of community moderates the relationship between co-creation experience and co-creation participation.

2.3.2 Platform Identification

The great revolution in the telecommunications landscape with the development of the Internet in the 1990s had a significant impact on cooperation between organizations and consumers (Kleemann et al., 2008). The emergence of Web 2.0 led to the development of social media (Sashi, 2012), which enabled people to easily connect and interact with each other on a global scale. "Social media employ mobile and web-based technologies to create highly interactive platforms via which individuals and communities share, co-create, discuss, and modify user-generated content" (Kietzmann et al., 2011, p. 241). Social media has had a significant impact on how people communicate and interact with each other, as well as how businesses engage with their customers and market their products and services.

In digital media, the existence of virtual communication platforms is extremely important (Dvorak, 2013; Füller et al., 2011). These platforms enable people to connect and communicate in real-time, regardless of their physical location, which makes it easier for businesses to reach out to their customers and build relationships with them. It is through them that consumer, user and firms engagement occurs (Brodie et al., 2013).

The use of social media has found various ways of positioning according to the target audience, which has led to a wide variety of different platforms. Examples of interactive platforms include blogs, content communities, forums, and social networking sites (Kaplan & Haenlein, 2010; Kietzmann et al., 2011; Lorenzo-Romero et al., 2014; Romero & Molina, 2011). Since virtual platforms can be designed for different purposes, such as social networking, e-commerce, education, gaming, and teleconferencing, the features and tools provided to users can vary greatly depending on the platform's objectives. For example, a social networking platform might offer chat rooms, forums, blogs, and personal profiles, while an e-commerce platform might provide online storefronts, shopping carts, and payment processing systems.

However, all these different platforms have something in common, allowing users to create and exchange content and interact with each other. Social media platforms, such as Facebook, Twitter, and Instagram, allowed users to create and share content with others, and

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engage in conversations and collaborations with people from all over the world. This democratization of content creation and distribution gave rise to a new era of user-generated content and participatory culture.

Several organizations over the years have been incorporating social media as the basis for customer interaction in co-creating value (Lorenzo-Romero et al., 2014). Organizational awareness of what today's networked world has led them to discover is that there are many opportunities offered by social media that are essential when seeking successful collaboration with their customers (Kaplan & Haenlein, 2010). Mostly, because social media use has the benefit of worldwide access, with very low costs and fast user interaction.

Virtual communication platforms offer businesses a multifaceted means to connect with their customers, fostering interaction and soliciting valuable feedback on their products and services. This feedback loop serves as a wellspring of insights, driving improvements and enhancements that elevate the quality of their offerings. Furthermore, these platforms serve as versatile marketing channels, enabling firms to promote their products and services, disseminate brand information, and engage with customers on a more intimate and personalized level.

Beyond customer interactions, these digital platforms also serve as crucibles for collaboration and engagement among team members. This proves particularly essential in remote work environments, where individuals are geographically dispersed. Within these virtual spaces, people can seamlessly unite to work on projects, share innovative ideas, and provide real-time feedback. The beauty of these platforms lies in their inclusivity, allowing users to participate according to their individual technical skills, adaptability, and the time available to them. This adaptability ensures that diverse team members can actively contribute, regardless of their technological proficiency or scheduling constraints (Fernandes & Remelhe, 2016; Heinonen et al., 2010; Meuter et al., 2005; Sawhney et al., 2005). Thus, the emergence of online platforms and social media has facilitated communication and collaboration between consumers and firms, enabling co-creation to become a more common practice.

The technologies behind these platforms let know what users prefer, how they interact, detect opinion leaders, know what issues are relevant to users, and understand behavioral and ideological trends (Rohrbeck et al., 2010; Sashi, 2012). Social media platforms can track user engagement with posts and content and use this data to understand what topics are most relevant to users. By analyzing user data, firms and brands can gain a better understanding of their customers and use this information to improve their products and services. Similarly, data analytics tools can be used to analyze user behavior on websites or mobile apps, and to identify patterns and trends in user interactions. This can help brands to optimize their user experience and improve the usability of their products and services. Moreover, this can help brands to create more targeted and effective marketing campaigns and to develop new products and services that meet the needs and preferences of their customers. Furthermore, by identifying opinion leaders and influencers within their customer base, firms and brands can leverage these individuals to promote their products and services and to spread brand awareness. This can be particularly effective in social media marketing, where opinion leaders can have a significant impact on the reach and engagement of brand content. In summary, the technologies behind these platforms provide firms and brands with valuable insights into their customers, and can be used to improve product development, marketing, and customer engagement strategies.

Therefore, these platforms and technologies have become important drivers of value creation and co-creation, since sharing information and knowledge is an integral function of

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resources and the main reason for using platforms (Kim et al., 2011; Pahl-Wostl & Hare, 2004). By sharing information and knowledge, users can gain new insights, learn new skills, and make better decisions about products, services, or issues of interest. This sharing of knowledge can take various forms, such as online tutorials, reviews, recommendations, and discussions, and can be facilitated through different channels, such as social media, online communities, and open-source software. Moreover, sharing information and knowledge can also promote collaboration and co-creation among users, enabling them to work together towards common goals and develop new products and services that better meet their needs and preferences. This collaborative innovation is a significant aspect of virtual platforms and has led to the emergence of new forms of value creation that are more responsive to the needs and preferences of users. Through virtual platforms, users integrate their operational resources (i.e., information, skills, knowledge, relationships and culture) as they interact with each other, co-creating value for the firms, themselves and other customers by sharing information, seeking knowledge that other users possess, develop responsible behavior and personal interaction (Yi & Gong, 2013; Yi et al., 2013).

Currently, communication platforms are developed as digital services that support the communication of groups of people and allow the collection, transmission of communication, knowledge sharing, as well as users to interact (Baruah, 2012; Kietzmann et al., 2011; Sawhney et al., 2005; Yi et al., 2013). These platforms operate by using a combination of software, hardware, and network technologies to provide a virtual environment that mimics the physical world. They are developed and managed by organizations, whether commercial or not, that want to attract users to address topics that are of interest to organizations and their users (Sawhney et al., 2005).

To use a virtual platform, users typically need to create an account and log in to the platform using their credentials. Once logged in, they can navigate through the platform and interact with other users by sending messages, joining groups, or participating in events. The platform's user interface is designed to be intuitive and easy to use, allowing users to access the platform's features and tools with minimal effort.

At the same time, virtual communication platforms offer a range of features and tools that can be customized according to the user's needs and preferences, such as adjusting the font size, changing the color scheme, or choosing between different display modes. For example, users can choose to participate in text-based chat sessions or video conferencing calls, depending on their communication style and availability. Also enable users to access and participate in discussions or meetings at their own pace and on their own schedule. This autonomy empowers users to shape their own experience according to their preferences and needs, which can help users feel more comfortable and in turn lead to a sense of ownership and engagement with the platform and can ultimately improve their overall experience.

In addition, users also gain knowledge about the platform itself as they interact with it. They learn how to navigate through the features, understand the platform's functionalities, and become familiar with its layout and design. This knowledge empowers users to better utilize the platform, leading to a more enjoyable and satisfying experience.

Moreover, virtual communication platforms are constantly evolving and adapting to meet the changing needs of users. Inclusive, introduce new features or tools to enhance the user experience or improve the platform's functionality. Also make updates and improvements based on feedback from users, which can help to address any issues or challenges that users may have encountered. Systems are developed to be highly usable by people according to their context and can be changed whenever the user needs them (Gong et al., 2020; Paternò & Santoro, 2019).

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By offering a range of customization options and incorporating feedback from users, these platforms can help to create a more user-friendly and engaging digital environment. These platforms are typically developed with a user-centered approach, which means that the user's needs and preferences are considered throughout the design and development process. This adaptability aims at the user identifying more and more with the platform he or she uses. When users are given the ability to customize their experience, such as choosing themes, layouts, or features that suit their preferences, it fosters a sense of ownership and personalization, leading to increased user satisfaction and identification with the platform. In other words, the various customization options, personalization features, and user-centric design elements that make the platform feel like a reflection of the user's preferences and needs can result in user platform identification.

Platform identification helps to create a sense of belonging and affinity between the users and the platform. It can be defined as the means of communication between the firm and the users for which these same users feel a strong connection, mainly because they perceive that the platform corresponds to their interests, needs, beliefs, values, and provides guarantees of personal, social, and cultural enrichment. In this sense, platform identification refers to the extent to which users identify with the platform and feel a sense of loyalty towards it, which can have a significant impact on their co-creation behaviors and experiences (Kalligeros et al., 2006; Moghadamzadeh et al., 2020; Munthali et al., 2021).

Overall, platform identification plays a critical role in the co-creation process and has a significant impact on the user experience and engagement on virtual platforms. When users can relate to and identify with the platform, they are more likely to feel a sense of attachment, loyalty, and ownership towards it. This sense of platform identification creates a positive emotional connection with the platform, which affects their users' overall enjoyment of the experience and can lead to increased involvement and participation in co-creation projects, as individuals who identify with the platform are more likely to be motivated to contribute to its development. Users who identify with the platform are more likely to have a positive attitude towards it, actively participate in co-creation activities, and spread positive word-of-mouth, contributing to the growth and success of the platform.

Research has shown that the co-creation experience and platform identification are closely linked and mutually reinforcing (Füller et al., 2011; Kozinets et al., 2021; Nadeem et al., 2020). When users identify with the virtual platform that facilitates co-creation, they are more likely to engage in the process and feel a sense of ownership and connection to the community. This, in turn, can lead to a more positive co-creation experience and increased value creation for all stakeholders involved (Hajli, Shanmugam, et al., 2017). Moreover, research has shown that platform identification is positively correlated with user satisfaction, engagement, and loyalty (Rangaswamy et al., 2020). So, it's important for platforms to prioritize and cultivate a sense of platform identification among users to foster a thriving and successful co-creation ecosystem.

H5: Platform identification is positively related to co-creation experience.

Platform identification refers to the extent to which individuals feel a sense of identification or connection with the platform or environment in which co-creation activities take place. This could include online platforms, physical spaces, or other types of collaborative environments. For firms, platform identification proves to be of high economic importance because through it they can achieve a high level of user participation in co-creation environments (Breidbach et al., 2014; Nadeem, Juntunen, et al., 2021; Nadeem et al., 2020;

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Tseng & Kuo, 2014), but also because it enables a huge transformation of traditional business models into digital and participative business models directly with their customers (Clements et al., 2022; Light & Miskelly, 2019; Yao & Miao, 2021).

Research has shown that platform identification can be a strong motivator for user participation in co-creation activities (Cennamo, 2021; Ramaswamy & Ozcan, 2018; Trischler & Charles, 2019). When users identify with a platform, they are more likely to actively participate in co-creation activities, as they feel a sense of ownership and connection to the platform. They are more likely to have a sense of belonging and feel invested in the success of the platform. This can lead to increased motivation to participate in co-creation activities and provide valuable input and feedback. In other words, if participants have a high level of identification with the platform, they may be more likely to actively participate in co-creation activities and contribute to the value creation process; hence, platform identification can lead to increased engagement, loyalty, and willingness to contribute to the platform and its offerings. On the other hand, if participants have a low level of platform identification, they may be less motivated to engage in co-creation activities and may contribute less to the value creation process.

H6: Platform identification is positively related to co-creation participation.

In the current evolving landscape, the concept of co-creation has emerged as a foundational approach for cultivating value through collaborative endeavors. This paradigm shift has triggered an extensive exploration of the intricate dynamics that underpin prosperous co-creation initiatives, particularly within the realm of co-creation platforms. Positioned at the core of this exploratory journey lies the hypothesis that the intricate interplay between the co-creation experience and co-creation participation finds itself swayed by the influential force of platform identification.

The significance of this endeavor is deeply rooted in its potential to unveil the multifaceted interplay that weaves together platform identification, co-creation experience, and the ensuing co-creation participation. Platform identification, a pivotal construct within this hypothesis, harbors invaluable insights that enable an understanding of individuals' engagement levels within co-creation activities. It pertains to the extent of emotional and social bonds forged by individuals with the co-creation platform (Babić Rosario et al., 2022). As participants perceive themselves as integral fragments of a larger community united by shared aspirations and values, their innate inclination to actively partake in co-creation initiatives becomes increasingly pronounced (Fetterman, 1994).

Fundamentally, the profound influence exerted by platform identification on participants' inclination to immerse themselves fully in co-creation pursuits. Through an intricate exploration of the underlying psychological mechanisms that nurture a sense of belonging and a strong affiliation to the platform, there can be an amplification or attenuation of the link between the co-creation experience and subsequent co-creation participation (Sarmah & Rahman, 2018).

The strength of participants' identification with the platform acts as an enhancer, amplifying the link between their co-creation experiences and their eagerness to actively participate in ongoing co-creation ventures. In essence, heightened platform identification accentuates the potency of positive co-creation experiences, reinforcing intrinsic motivation and cultivating a consistent willingness to contribute wholeheartedly.

This phenomenon gains lucidity when contemplating the emotional resonance and profound sense of affiliation that a robust platform identification fosters between participants

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and the broader co-creation community (Lee & van Dolen, 2015; Palma et al., 2018). This emotional bond significantly shapes the value attributed to favorable experiences encountered within the platform's ecosystem. Consequently, these experiences evolve into enduring commitments and enthusiastic engagement. Participants, feeling deeply interwoven with the shared objectives and values upheld by the platform, are galvanized to collaborate and contribute not merely due to external incentives but also driven by a genuine internal aspiration.

Moreover, the investigation also aspires to uncover potential boundary conditions and intricate nuances within this intricate interplay. By factoring in variables such as participants' prior experiences, the diversity encapsulated within the co-creation community, and the distinctive nature of co-creation projects, the study endeavors to construct a holistic framework that comprehends the multifaceted dynamics in operation.

The hypothesis that the interplay between co-creation experience and co-creation participation is influenced by the intrinsic presence of emotional and social elements tied to platform identification underscores a crucial aspect (Ranjan & Read, 2014, 2019; Sebbah & Jazi, 2022). By delving into the intricate web of interactions binding these variables, the study seeks to elevate the understanding of how these combined factors sway the long-term sustainability of co-creation endeavors and the persistent generation of value within collaborative platforms. In doing so, this research strives to present a more nuanced and intricate grasp of the dynamic evolution underpinning modern value co-creation.

H7: Platform identification moderates the relationship between co-creation experience and co-creation participation.

2.3.3 Innovativeness

The individual's inclination towards innovativeness serves as a pivotal determinant, profoundly influencing their journey within the realm of co-creation. Innovativeness encompasses the eagerness to explore uncharted realms, embrace calculated risks, and deploy imaginative strategies to ignite innovation (de Vasconcellos et al., 2019; Malik & Ahsan, 2019; Turulja & Bajgoric, 2018). This disposition encapsulates a willingness to traverse uncharted territories, experiment with fresh methodologies, and remain receptive to learning and adaptability as circumstances evolve.

An individual's inclination towards innovativeness inherently drives them towards creative actions, shaping diverse methods or strategies to navigate specific situations. This collaborative process thrives on open discussions and reflective exchanges, involving all contributors of ideas and suggestions, echoing the insights of Carrillo-Hermosilla et al. (2010) and O'Reilly and Binns (2019).

The rapid evolution of our contemporary landscape further underscores the critical role of innovativeness. This intrinsic attribute empowers individuals to differentiate themselves and equips organizations with the resilience to retain competitiveness when confronted with new challenges and unforeseen opportunities.

As co-creation environments embrace the fusion of diverse viewpoints, the transformative impact of innovativeness becomes manifest in the convergence of innovative minds. Collaborative endeavors culminate in solutions that transcend the mundane, offering fresh perspectives that redefine the landscape of convention (Evans, 2016; Han et al., 2012; Reilly, 1973) .

The co-creation landscape thrives on the synergy of distinct ideas and collective expertise, where innovativeness emerges as a linchpin unifying inventive thought with

pragmatic application. Within co-creation environments, the potency of innovativeness becomes apparent in the collaborative generation of innovative solutions (Dong & Sivakumar, 2017; Fernandes & Remelhe, 2016; Oertzen et al., 2018). This synthesis particularly shines in the seamless integration of new features and functionalities that elevate the final product. Innovativeness propels participants to envision possibilities beyond the ordinary, while the collaborative essence of co-creation encourages iterative refinement (Mokhber et al., 2017). This dynamic interplay ensures that innovative concepts undergo rigorous testing and gradual improvement, leading to the creation of solutions that are imaginative as well as functionally robust.

The profound impact of an individual's innovativeness surfaces in co-creation environments through the creation of transformative solutions and the seamless integration of novel features and functionalities. As innovative mindsets converge, collaborative efforts lead to solutions that transcend predictability and routine, enriched by various perspectives that elevate the ideation process and the implementation of pioneering ideas.

The fusion of diverse perspectives facilitated by innovativeness not only enriches the ideation process but also fuels the implementation of pioneering ideas (Reilly, 1973; Smets et al., 2015; Wang & Dass, 2017). Participants, driven by their propensity for innovative thinking, exhibit a heightened eagerness to experiment with untested strategies and incorporate novel features (Kumar & Reinartz, 2016; Ma et al., 2014; Munir et al., 2015). This active experimentation and willingness to adapt substantiates the transformative potential of co-creation environments (Kianto et al., 2017). Through the dynamic interweaving of talents and the fusion of fresh viewpoints, co-creation environments flourish as fertile grounds for the emergence of solutions that transcend the boundaries of convention.

In essence, the synergy between an individual's innovative mindset and their co-creation experience holds a pivotal role, emphasizing the profound impact of inventive thinking on both the process and the results. Within this fertile environment, cultivated by curiosity and collaborative exploration, solutions emerge that transcend the commonplace, highlighting the inherent strength of co-creation.

In the context of co-creation initiatives, an individual's innate predisposition towards innovativeness assumes a dual role: as a determinant factor shaping the trajectory and as a moderating influence enriching the outcomes (González-Mansilla et al., 2019; Kim et al., 2019). The inclination towards innovativeness plays a pivotal role in shaping the co-creation experience. It signifies not just a willingness to explore uncharted territories, embrace calculated risks, and employ inventive strategies to foster innovation (Hilton et al., 2012; Prahalad & Ramaswamy, 2004b; Randall et al., 2014), but also reflects an openness to learning and adaptability, fostering creative actions that navigate diverse challenges. The infusion of an innovative mindset accelerates the co-creation process and substantially enhances the overall experiential quality.

The intrinsic interplay between an individual's innovativeness and their co-creation experience establishes a robust link between the two. This synergy exemplifies the transformative potential of innovative thinking, not only amplifying the co-creation process but also yielding solutions that transcend the ordinary. In essence, the positive relationship between innovativeness and co-creation experience reflects harmonious collaboration that drives both individual growth and collective innovation.

H8: Innovativeness is positively related to co-creation experience.

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The influence exerted by platform identification on the co-creation experience transcends simplicity and reveals itself as a phenomenon of intricate nuances, resisting a uniform approach for all involved users. At the heart of this complexity, innovativeness emerges as a prominent element, playing a pivotal moderating role in the intricate interplay between platform identification and the co-creation experience. This paradigm finds substantial support in investigations conducted by prominent scholars, as evidenced by the contributions of Akman et al. (2019), Roberts et al. (2021), and Yen et al. (2020).

The underlying premise of this investigative hypothesis sheds light on the remarkable variation that permeates the way platform identification impacts the co-creation experience, as this variation is deeply influenced by individuals' innovative prowess. In line with the insights delineated by Frow et al. (2015), this hypothesis suggests that individuals endowed with a high degree of innovation are inclined to adopt intrinsic exploration approaches when engaging with the complex co-creation functionalities present on the platform. Such innovative inclination empowers them to uniquely explore the more advanced nuances of the platform, shaping them in original and creative ways. A key point, addressed by Ramaswamy and Gouillart (2010) and Storbacka et al. (2016), is that these users demonstrate the ability to adapt these tools to their specific needs and objectives, thus amplifying their effectiveness.

In this context, platform identification plays an essential role for innovators, as they see the platform as a conducive space for expressing their bold ideas and visionary experiments. The co-creation environment is conceived, as described by Ramaswamy and Gouillart (2010) and Storbacka et al. (2016), as a fertile ground for creative autonomy and authentic problem-solving. Furthermore, this deep identification with the platform amplifies the intrinsic motivation of innovative individuals, a perspective echoing the conclusions of Sawhney et al. (2005). The opportunity to co-create and innovate resonates harmoniously with their inherently creative mindset, culminating not only in an engaging co-creation experience but also an intrinsically rewarding one.

However, for users less prone to innovation, the dynamics are drawn differently. The relationship between platform identification and the co-creation experience emerges less prominently, as their approaches might be more conventional and predictable. Such a perspective implies that innovation acts as the connecting element, modulating the relationship between platform identification and the quality of the co-creation experience. This moderation unfolds according to the level of innovation exhibited by each user, adding depth and nuance to the interaction between these interdependent elements.

The central premise of this research hypothesis is that innovation acts as a filter shaping how platform identification influences the co-creation experience. In other words, the intensity and nature of the connection between platform identification and the co-creation experience vary according to the user's level of innovation. Users with a high level of innovation are inclined to adopt a more exploratory and experimental approach when interacting with the co-creation platform. This innovative disposition leads them to use the advanced functionalities of the platform in creative and original ways. As pointed out by Frow et al. (2015), these individuals have the ability to extract maximum value from co-creation tools by adapting them to their specific needs and goals. Platform identification becomes an essential element for innovative users, as they see the platform as a space to express their ideas and experiments. As highlighted by Ramaswamy and Gouillart (2010) and Storbacka et al. (2016), the co-creation platform is perceived as an environment that allows for creative autonomy and the pursuit of original solutions to complex challenges. Additionally, platform identification can enhance the intrinsic motivation of innovative users, as observed by Sawhney et al. (2005). The opportunity to co-create and innovate aligns deeply with their

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creative mindset, resulting in a more engaging and rewarding co-creation experience. However, the dynamics differ for users with a low level of innovation. For them, the relationship between platform identification and the co-creation experience is less pronounced. They may be more inclined to adopt traditional and conventional approaches when using the co-creation platform, thus limiting the impact of platform identification on the co-creation experience. The hypothesis that innovation can moderate the relationship between platform identification and the co-creation experience suggests that innovation acts as a key element that amplifies or attenuates the connection between platform identification and the quality of the co-creation experience, depending on the user's level of innovation. This perspective offers a more comprehensive and differentiated understanding of the complex dynamics involved in the interaction between these elements.

H9: Innovativeness moderates the relationship between platform identification and co-creation experience.

The interplay between the influence of a sense of community and the co-creation experience is intricate, with its dynamics significantly molded by the innovative inclinations displayed by individuals (Füller et al., 2014). This foundation underscores the pivotal role that innovativeness assumes in moderating the complex interplay that links the sense of community and the co-creation experience. This viewpoint aligns seamlessly with insights offered by respected scholars and researchers, thereby emphasizing the intricate interdependencies intrinsic to this relational framework.

At the essence of this exploration lies the notion that the presence and potency of the bond between the sense of community and the co-creation experience are not predetermined constants; instead, they remain fluid and subject to variation based on the level of innovativeness showcased by participants (Söderlund & Bredin, 2011). Innovative thinking, known for nurturing the emergence of novel knowledge and ideas, elegantly weaves into a robust sense of community. This robust sense of community doesn't merely foster a collaborative ambiance; it also provides a nurturing backdrop that enables the exploration and experimentation of these innovative concepts (Jiménez & Zheng, 2021).

As a result, individuals predisposed towards innovation tend to exhibit openness to novel ideas, alternative approaches, and diverse perspectives. In parallel, the sense of community cultivates a nurturing sphere where such individuals can freely express and exchange their innovative thoughts, thereby fostering an environment conducive to the co-creation process. The harmonious synergy between innovativeness and a strong sense of community culminates in an enriched co-creation experience marked by inclusivity and the pursuit of groundbreaking concepts.

A crucial facet deserving thorough consideration is the pivotal role played by a robust sense of community in fortifying the intrinsic innovativeness of users. This symbiotic relationship between a supportive community and individual innovativeness creates a profound synergy that transcends mere collaboration, ultimately heightening the overall quality and richness of the co-creation experience. The tapestry of this interaction is woven through the interplay of encouragement, shared insights, and the fertile ground for idea exchange that a vibrant community provides.

In this nurturing environment, individuals find their innovative capacities kindled and encouraged, leading to the emergence of novel ideas, bold experimentation, and creative problem-solving. The vibrant backdrop of a strong sense of community offers fertile soil for these innovative seeds to germinate, thrive, and evolve. This, in turn, ushers in a co-creation

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experience characterized by its depth, dynamism, and potential to yield groundbreaking outcomes (Jiménez & Zheng, 2021; Söderlund & Bredin, 2011).

On the converse, in scenarios where the spark of innovativeness is dim or the sense of community lacks vigor, engagement in co-creation endeavors may stumble. The absence of a supportive network can stifle the growth of new ideas, as the avenues for constructive critique, encouragement, and shared learning become restricted. This can lead to missed opportunities for meaningful exploration and, consequently, limit the growth of fresh insights and innovative contributions.

The intricate dance between the influence of the sense of community and the co-creation experience encompasses a myriad of dimensions, intricately influenced by the varying degrees of innovativeness demonstrated by participants. This perspective, solidly grounded in the tapestry of existing research, underscores the multifaceted nature of these relationships. By delving into these nuances, a comprehensive understanding of the intricate dynamics innate to co-creation endeavors is gained, providing valuable insights into the fusion of collaboration and innovation.

H10: Innovativeness moderates the relationship between sense of community and co-creation experience.

2.4 CO-CREATION CONSEQUENCES

In a second phase, this study aims to study the consequences of co-creation. Active and collaborative participation in co-creation environments can lead to several direct effects, which can be noticeable both by those involved and the people around them.

The following table shows some of the direct effects of co-creation recently studied.

Table 11. Direct Effects of Co-Creation

Effects	Description	Author(s)
Improved product or service quality	Co-creation can lead to the development of products or services that better meet the needs and preferences of customers.	Chung and Tan (2022)
Increased customer satisfaction	By involving customers in the development process, businesses can create products and services that are more tailored to their needs, leading to higher levels of customer satisfaction.	Grissemann and Stokburger-Sauer (2012)
Enhanced brand loyalty	Co-creation can increase customer loyalty and advocacy, leading to a stronger connection to the brand and increased repeat business.	Iglesias et al. (2020)
Improved innovation	Co-creation can stimulate innovation by bringing together diverse perspectives and ideas, leading to the development of new products and services.	Voorberg et al. (2014)
Increased customer engagement	Co-creation can enhance customer engagement by involving them in the development process, creating a sense of ownership and connection to the brand.	Grissemann and Stokburger-Sauer (2012) Chathoth et al. (2016)
Better market positioning	Co-creation can help businesses differentiate themselves in the market by developing products and services that are unique and tailored to customer needs.	Sam Liu and Huang (2020)
Higher revenue	Co-creation can lead to higher revenue by creating	Tu et al. (2018)

Effects	Description	Author(s)
	products and services that better meet customer needs and preferences, resulting in increased sales.	
Greater competitive advantage	Co-creation can provide businesses with a competitive advantage by enabling them to develop products and services that better meet customer needs and preferences, leading to increased market share.	Ida (2017)
Improved customer loyalty	Co-creation can create a sense of community and connection among customers, leading to higher levels of customer loyalty and advocacy.	Iglesias et al. (2020)
Relational Value	The value that is created through the development of relationships between the firm and its customers can be describe by relational value. Supported by trust and loyalty, customer satisfaction, shared values, co-innovation, customer advocacy.	(Sahi et al., 2017)
Economic Value	Co-creation is based on the idea that value is not just created by the producer, but also by the customer and other stakeholders who are actively involved in the creation and delivery of products and services. This creates a shared responsibility for value creation and leads to the creation of economic value that is greater than what would be possible through traditional producer-centric models.	Prahalad and Ramaswamy (2004b) Shams and Lombardi (2016)

Source: Own elaboration

Co-creation environments can be beneficial because they promote involvement and knowledge sharing among participants, which can lead to improvements in products or services. When participants are actively engaged in the co-creation process and contribute their suggestions, ideas, and expertise, they can help to identify and solve problems, innovate new solutions and improve the overall quality of the product or service, while also fostering stronger relationships and networks among participants. Co-creation allows to create solid partnerships in the search for solutions to current problems and to find new approaches that lead to new solutions to old problems (Gummesson & Mele, 2010; Hillgren et al., 2011). The relationship that is created in the co-creation process has competitive advantages that lead to a closer relationship between the customer and the firm, in addition to an end result closer to what the target audience wants (Haro et al., 2014). Moreover, co-creation can also promote a sense of ownership and attachment to the product or service among participants, as they have played an active role in its development. This can lead to increased satisfaction and loyalty among customers or users, as they feel that their needs and preferences have been considered.

2.4.1 Value

In the relationships that are created through co-creation experience and co-creation participation some benefits arise, some more aimed at consumers, others more at firms. In many cases, consumers receive various economic benefits through discounts, have greater control over the service they are offered or purchase a product (Bitner et al., 1997; Grönroos, 2012; Kuzgun & Asugman, 2015; Zeithaml, 1988). In addition to economic benefits,

consumers also benefit from a sense of empowerment, increased trust and loyalty towards the firm, and the satisfaction of being involved in the development of products and services that meet their needs and preferences (Hoyer et al., 2010; Ramaswamy & Gouillart, 2010).

Economic value refers to the economic benefits that are generated through the co-creation process, such as increased efficiency, reduced costs, and improved products or services. It is the value that a person subjectively attaches to a good or service based on the benefits they derive, estimated based on the person's willingness and measured based on the terms people would be paying balanced with the benefits that come from the consumer experience of having collaborated with the firm and this participation resulted in better quality, reduced premium, greater customization or greater control in the way a service is provided or a product is produced (Ahmadi Zeleti et al., 2016; Belfield et al., 2015; Landefeld & Seskin, 1982).

According Zwass (2010), the economic value received by consumers who are tangled in co-creation can derive from and may involve:

1. The community in which they participate, due to the open innovation that is created.
2. The firm that benefited from having a primary interest in improving its products and services.
3. The platform provider, if there is a third party to manage or provide the interaction platform, for adding content provided by the various participants and for extracting value that should be understood as knowledge.
4. The employees of the firms involved, mainly the provision of technical information.
5. Direct payment - Consumers can receive direct payment for their participation in co-creation activities, such as focus groups or surveys.
6. Enhanced product or service quality - Through co-creation, customers can have a direct impact on the development of products or services, leading to higher quality and more personalized offerings.
7. Improved customer satisfaction - Co-creation allows for a greater understanding of customer needs and preferences, leading to higher levels of customer satisfaction.
8. Increased loyalty and advocacy - When customers feel valued and engaged in the co-creation process, they are more likely to become loyal to the brand and advocate for it to others.
9. Learning and personal development - Consumers can gain knowledge and skills through their participation in co-creation activities, which can lead to personal growth and development.

Thus, when considering the benefits derived from economic value, they can be grouped into:

1. Tangible benefits are measurable, quantifiable advantages that can be directly linked to co-creation activities, such as increased revenue, reduced costs, or improved operational efficiency. These benefits can be easily identified and measured, providing a clear and objective understanding of the positive impact of co-creation initiatives. This clarity in identification and measurement aids in evaluating the effectiveness of co-creation efforts and highlights the tangible value created by the process.
2. Intangible benefits are more subjective and difficult to quantify. They may include improvements in customer satisfaction, increased brand loyalty, or enhanced reputation. While they are not as easily measurable as tangible benefits, they can still have a significant impact on a firm's overall success and profitability.

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Table 12 presents studies that associate co-creation with economic value.

Table 12. Direct Effects of Co-Creation: Economic Value

Paper	Authors / Year	Journal	
The role of co-creation experience in engaging customers with service brands	Hussain et al. (2021)	Journal of Product & Brand Management	Increased customer satisfaction: co-creation allows customers to have a greater sense of involvement in the development of a product or service, which can lead to higher levels of customer satisfaction. Satisfied customers are more likely to return to a business and recommend it to others, which can increase sales and revenue.
What Is Customer Value and How Can You Create It?	Mahajan (2020)	Journal of Creating Value	Improved product quality: when customers are involved in the creation process, they can provide feedback and insights that can improve the quality of products, services and reduce costs. This can lead to increased customer loyalty and a competitive advantage in the market.
Value Co-Creation Processes - Early Stages of Value Chains Involving High-Tech Business Markets: Samsung–Qualcomm Semiconductor Foundry Businesses	Park and Lee (2015)	Journal of Business-to-Business Marketing	Faster time-to-market: co-creation can help businesses develop products and services more quickly, as customers can provide valuable insights and feedback throughout the design process. This can help businesses stay ahead of competitors and capture market share more quickly by low costs.
Customer co-creation: a typology and research agenda	O'Hern and Rindfleisch (2017)	Review of marketing research	Reduced development costs: co-creation can also help to reduce the costs of product development. By involving customers in the process, firms can gain valuable insights into customer preferences and needs, which can help to reduce the risk of developing products that do not meet customer expectations.
Investigating the Role of Customer Co-Creation Behavior on Social Media Platforms in Rendering Innovative Services	Moghadamzadeh et al. (2020)	Sustainability	Increased innovation: co-creation can also lead to increased innovation, as customers can provide new and innovative ideas that may not have been considered by the firm. This can lead to the development of new products or services that can increase economic value for the firm.
Co-creation: A Key Link Between Corporate Social Responsibility, Customer Trust, and Customer Loyalty	Iglesias et al. (2020)	Journal of Business Ethics	Increased customer loyalty: co-creation can also help to build stronger relationships between customers and the firm, leading to increased customer loyalty. Loyal customers are more likely to make repeat purchases and recommend the firm to others, which can increase economic value.

Source: Own elaboration

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Co-creation experience refers to the process of collaborating with customers or other stakeholders to create value. Involving customers in the co-creation process provides decision makers with valuable insights and perspectives that they may not have considered otherwise. By leveraging the resources and expertise of these individuals, firms can create more effective and innovative solutions that better meet the needs and preferences of their customers. Customers can provide feedback on what they like and dislike about a product or service, offer suggestions for improvement, and even propose new ideas for future products or services. This enables firms to quickly identify issues, respond to customer needs and preferences, and make necessary adjustments, which can ultimately lead to faster and more effective product development (O'Hern & Rindfleisch, 2017; M. Zhang et al., 2017). This can help decision makers make more informed decisions and ultimately lead to more successful outcomes.

Building upon the concept of co-creation experience, it's important to recognize that this collaborative process is not confined to a single instance but rather a continuous, dynamic cycle. Consumer behavior and expectations are ever-evolving, and firms must consistently adapt to meet these changing demands to remain competitive in the market. As Nadeem et al. (2020) highlighted, this entails a perpetual endeavor by consumers to identify the most favorable terms and improvements in the services or products offered by businesses.

The persistent pursuit of heightened value and quality seamlessly aligns with the core tenets of co-creation. This underscores the pivotal importance of involving customers in both the genesis and refinement of offerings. Through continuous engagement with customers across the entire development lifecycle, businesses gain the ability to deftly adapt to the ever-shifting landscape of consumer preferences and demands. Consequently, a more profound comprehension of what genuinely resonates with the target audience is fostered.

As markets mature and consumer empowerment steadily ascends, the role of co-creation becomes increasingly indispensable (Sanders & Stappers, 2008). Empowered consumers, equipped with information and an array of choices, gravitate towards experiences that harmonize with their individual needs (Morteo, 2018; Prahalad, 2004; Prahalad & Ramaswamy, 2004a, 2004b; Zwick et al., 2008). This is where the concept of co-creation takes on its transformative mantle, shaping the very essence of economic value.

The influence of co-creation transcends the realms of mere product or service design. It permeates the entirety of the consumer journey, orchestrating how customers perceive, interact with, and extract value from a brand. By proactively enlisting customers in the ideation process, firms can meticulously tailor their offerings to cater to these well-informed and perceptive consumers.

The symbiotic synergy between businesses and customers extends beyond incremental enhancements; it catalyzes revolutionary innovation. Collaborative insights from customers can yield products and services that not only align with prevailing trends but also introduce distinctive features that distinguish the firm from its rivals. These unique attributes, not readily replicable, grant the business a competitive edge (Porter, 1990).

Furthermore, with the ascendancy of customization and personalization, the co-creation experience assumes a pivotal role (Sanders & Stappers, 2008; Wouters & Kirchberger, 2015). The insights gleaned from customers are harnessed to craft bespoke experiences, fostering an elevated perception of value among consumers. Within this intricate choreography of feedback, unceasing refinement, innovation, and personalization, customers bear witness to the ever-increasing realization of their aspirations.

It is paramount to acknowledge that in this dynamic interplay, both businesses and consumers stand to reap rewards. Customers reap economic benefits through improved

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products, tailor-made experiences, and the contentment of actively shaping their consumption. Simultaneously, businesses harvest the fruits of a loyal customer base, heightened innovation, and a distinctive stance in the market.

The co-creation experience is far from a static collaboration; it thrives as a dynamic process that seamlessly aligns with the perpetual quest for augmented consumer value and superior offerings. As consumers evolve into more discerning connoisseurs, in search of experiences that resonate deeply with their inclinations, co-creation emerges as the propelling impetus behind substantial innovation, bespoke tailoring, and economic value.

As consumers attain higher levels of information and a broader spectrum of choices, they inevitably embark on a quest for optimal value and experiences. This very juncture is where the co-creation experience emerges in its utmost significance. Its substantial impact on economic value becomes manifest. Through the active engagement of customers in the design and development process, businesses can create products and services that finely align with their needs and preferences. The co-creation experience drives the inception of inventive and distinctive offerings, which prove challenging for competitors to emulate. Concurrently, this experience enriches consumers with personalized encounters, accentuating their sense of value. As the cycle of feedback, enhancement, innovation, and heightened personalization unfolds, consumers witness the gradual realization of their aspirations and desires. Consequently, the consumer reaps substantial economic benefits.

Co-creation participation can also have a positive impact on economic value for both customers and firms (Hsieh et al., 2022). It is increasingly evident that co-creation participation is possibly the source and strong influencer for consumers to perceive that participating with firms can obtain a certain economic value as a return (Nadeem et al., 2020). Sometimes, the economic benefits for participants may be reduced price, greater convenience of payment due to the fact that firms may have various options for setting up the service or good to purchase, or firms may make the goods and services available completely free of charge to those they collaborate with (Dong & Sivakumar, 2017; Kumar et al., 2018; Ramaswamy & Gouillart, 2010; Ramaswamy & Ozcan, 2016; Tran & Vu, 2021). Although often, the economic value obtained is not translated into amounts of money, but rather a completely subjective economic value that is only meaningful to the consumer (Ahmadi Zeleti et al., 2016; Akter et al., 2022; Belfield et al., 2015; B. Zhang et al., 2017). Economic value doesn't always have to be measured in terms of money. Consumers may perceive economic value in different ways, such as time saved, convenience, improved quality of life, or the satisfaction of having a personalized product or service.

By participating in the co-creation process, customers can provide valuable feedback to firms on how their offerings can be improved to better meet their needs and preferences. This feedback can help firms to develop products or services that are more aligned with customer needs and preferences, which can lead to increased satisfaction and loyalty. This can result in increased value and benefits from the offerings, as well as potentially lower costs due to a better fit with their needs.

So in this approach, those involved also aim at economic value exploration (Xiao et al., 2020). Co-creation participation can lead to economic value exploration for both customers and firms. The intent of the interactions helps to improve the firm's business and customers to satisfy their real needs (García-Rosell et al., 2019; Kar & Pani, 2014). By collaborating and sharing their experiences, knowledge, and skills, customers and firms can jointly develop new ideas and innovations that can lead to the creation of new products or services, or the improvement of existing ones. This can result in economic benefits for all participants; it can create economic value by increasing revenue and profits for firms, as well as increasing the

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value and benefits of the products or services for customers (Martins, 2014; Nysveen & Pedersen, 2014; Palma et al., 2018; Shrestha, 2014). This also gives them the opportunity to reduce uncertainties and see their doubts and concerns that may have arisen during their participation clarified (Chesbrough, 2010; Lee & Kim, 2018).

Moreover, co-creation can also lead to an increased appreciation of the perceived related value, as customers are more likely to see the value of a product or service that they have had a hand in creating (Aulia et al., 2016; Tsai et al., 2010). By participating in the co-creation experience, customers can develop a deeper understanding of the firm's values, goals, and processes. This can lead to a sense of shared ownership and responsibility, and a greater appreciation for the firm's offerings and greater awareness of the value of the products or services they are using, which can increase customers perception of its economic value.

To summarize, the participation of customers with the firms, besides having the opportunity to jointly experience and share their experiences of using products or services, also have the opportunity to evaluate the benefits that each one has obtained (Gibbert et al., 2002; Lee & Kim, 2018; Nambisan & Baron, 2009), which would increase the economic value perceived.

H11a: Co-creation experience is positively related to economic value.
H11b: Co-creation participation is positively related to economic value.

Additionally, all involvement and participation create interactions that may translate into long-term relationships. Participants also determine that there is value that is generated from the relationships established. This value that is generated from the relationships established can be referred to as "relational value".

Thus, relational value is the extent to which a person feels valued by significant others, where one feels appreciation provided by feelings of well-being, acceptance and empathy in interpersonal relationships or supported by technologies capable of enhancing the adherence of the relationship between customers and the firm, especially in a co-creation environment (Chan et al., 2018; Himes & Muraca, 2018; Skubel et al., 2019). Relational value refers to the value that is created through the development of a long-term, collaborative relationship between a firm and its customers. In other words, it refers to the relationships and social connections that are formed because of co-creation. This value is based on factors such as mutual trust, understanding, cooperation, commitment, and loyalty, which are developed over time through positive interactions and experiences.

The benefits of customer engagement with firms can have a significant impact on their results, especially when it comes to the relational value that is created during the stages when consumers are involved in co-creation (Ernst et al., 2017). Co-creation activities can help enhance customer engagement and create relational value, which refers to the benefits derived from the relationship between the customer and the firm, beyond the products or services themselves (Ernst et al., 2017). Relational value is often seen as a key outcome of co-creation activities, as it highlights the importance of building and maintaining relationships between participants beyond the immediate project or task at hand. Co-creation involves a high level of engagement and collaboration between the firm and its customers, forcing firms to keep up to date to create and grow relationships with customers. These relationships can lead to ongoing collaboration, support, and mutual benefit, even after the co-creation project has ended, and can have significant value for the participants beyond the immediate co-creation project. For example, participants may develop new business contacts or partnerships, or find new job opportunities through their involvement in co-creation environments. They may also develop

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personal connections with other participants that can lead to new friendships or support networks.

Table 13 presents studies that associate co-creation with relational value.

Table 13. Direct Effects of Co-Creation: Relational Value

Paper	Authors / Year	Journal	
How do experiences enhance brand relationship performance and value co-creation in social commerce? The role of consumer engagement and self brand-connection	Nadeem, Tan, et al. (2021)	Technological Forecasting and Social Change	The direct effects of co-creation in relational value are that it helps to increase customer engagement. When customers are given the opportunity to participate in the creation of products or services, they feel more invested in the firm and the products that they are helping to create. This increased engagement can lead to increased customer loyalty and advocacy.
Customer co-creation in B2C e-commerce: does it lead to better new products?	Pee (2016)	Electronic Commerce Research	The direct effects of co-creation lead to a better understanding of customer needs and preferences. By involving customers in the creation process, firms can gain insights into what their customers want and how they want it delivered. This understanding can help firms to develop more customer-centric products and services, which can further increase customer satisfaction and loyalty.
Does the source of external knowledge matter? Examining the role of customer co-creation and partner sourcing in knowledge creation and innovation	Goyal et al. (2020)	Information & Management	The direct effects of co-creation lead to increased innovation. When firms collaborate with their customers, they can leverage the collective knowledge and creativity of both parties to develop new and innovative solutions. This can lead to the development of products and services that are better aligned with customer needs and preferences, and that can provide a competitive advantage for the firm.
The value co-creation process as a determinant of customer satisfaction	Vega-Vazquez et al. (2013)	Management Decision	The direct effects of co-creation to Increased customer satisfaction: when customers are actively involved in the co-creation process, they feel a greater sense of satisfaction with the product or service that is being created. This can lead to increased loyalty and stronger relationships with the firm.
Value co-creation and perceived value: A customer perspective in the hospitality context	Solakis, Pena-Vinces, et al. (2022)	European Research on Management and Business Economics	The direct effects of co-creation improved communication: co-creation requires open and effective communication between customers and firms. This can help to build trust and transparency in the relationship, which can strengthen the overall value of

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Paper	Authors / Year	Journal	
			the relationship.
Co-creation in new product development: Which drivers of consumer participation?	(Mandolfo et al., 2020)	International Journal of Engineering Business Management	The direct effects of co-creation increased innovation: co-creation can lead to the development of new and innovative products and services that may not have been possible without the input of customers. This can help firms to stay competitive in the market and provide greater value to their customers.

Source: Own elaboration

Co-creation experiences can be a powerful way for firms to build strong relationships with their customers and create value that goes beyond the products or services they offer. Relational value refers to the overall value that customers perceive from their relationship with a firm. This includes not the quality of the product or service but the overall experience of interacting with the firm, including the quality of customer service and the level of personalization and engagement.

Successful co-creation experiences require not only knowledge and skills but also active participation, collaboration, and emotional and social engagement between customers and firms. The co-creation experience is based on a simple and collaborative engagement approach, where customers and other stakeholders are given the opportunity to explore, identify, learn, develop skills, and collaborate with each other.

Hence, the co-creation experience involves emotional and social aspects. Better co-creation experiences can lead to greater involvement of all participants, including customers, employees, and other stakeholders. By involving all participants in the co-creation process, firms can create a more collaborative and inclusive environment, where all ideas and perspectives are valued. The interaction created in the co-creation experience helps strengthen relationships between customers and firms, as well as in the relationship with other stakeholders who participate in the interactions (Payne et al., 2008; Ramaswamy & Gouillart, 2010).

Customers are not just looking for functional benefits from a product or service, but they also seek social and emotional benefits. For example, customers may feel more connected to a brand or firm when they are given the opportunity to provide input into the creation of a product or service and may also derive emotional satisfaction from being able to contribute their ideas and opinions to the product or service. Moreover, by involving customers in the creation process, the firm can demonstrate its willingness to listen to and incorporate customer feedback, which can lead to a more positive perception of the firm and its offerings, helping to build trust and rapport between the firm and its customers. Therefore, this strengthening of relationships seen from the side of the customer or user of a particular service, can be a link and an opportunity to create highly profound relations. There is thus a created relational value that is borne of profound relationships that are sustained by the interactions and results achieved by each participant (Romero & Molina, 2011; M. Zhang et al., 2017). Perceived relational value refers to the perceived benefits that participants receive from their relationships with each other. In the context of co-creation, perceived relational value can be reflected in the level of trust, openness, and collaboration among participants. Thus, when customers are involved in better co-creation experiences, they can get greater relational value from the process.

Co-creation participation can also have a positive impact on relational value for customers. The central idea of participation in co-creation is to facilitate the relationship between the various participants and to encourage co-creation behaviors that can strengthen the relationships created between them (Laud & Karpen, 2017). When participants engage in co-creation, they can build relationships with each other through ongoing communication, collaboration, and trust. These relationships contribute to the perceived relational value that participants receive from their participation in the co-creation process. Relational value derives from the relationship that occurs with the various participants in the interactions with firm and her partners (Carlson et al., 2018; Carlson et al., 2019).

Moreover, the more and more interactions between the various participants, the more properly integrated in this environment they will be. Participants who are already properly integrated in this environment have a capacity to better understand the importance of creating strong relationships in order to create extremely strong partnerships with a high relational value (Frempong et al., 2020; Lee & Kim, 2018; Riana et al., 2018).

Participation in co-creation also leads to a reduction in uncertainty, vulnerabilities, and an increase in participants' trust in each other (Wang et al., 2019). When participants work together in a co-creation environment, they can exchange ideas and feedback and build a shared understanding of the product or service being developed. This can lead to a reduction in uncertainty and vulnerabilities, as participants are able to identify potential issues and develop solutions collaboratively. By working together, participants can also build trust in each other's abilities and expertise, leading to a higher level of trust overall. The increased trust is transmitted to others through behaviors, conversations, and attitudes (Boadi et al., 2022; Zheng et al., 2017). Participants who have developed trust in each other and the firm are more likely to perceive a higher level of relational value.

H12a: Co-creation experience is positively related to relational value.
H12b: Co-creation participation is positively related to relational value.

2.4.2 Satisfaction

Satisfaction refers to a feeling of pleasure that results from the fulfillment of the expectations created by the customer or suggested by the firm, regarding the experience during the provision of a service or supply of a product (Blocker, 2012; Haji et al., 2021; Hsieh et al., 2022). The achievement of customer satisfaction presupposes a positive expectation that is realized, desirable, and beneficial (Burns & Neisner, 2006; Lindblom et al., 2020). Satisfaction is psychologically important in consumer behavior, because satisfaction is an emotional response that corresponds to a weighted judgment between the experience of cognitive and affective processes (Burns & Neisner, 2006; Lindblom et al., 2020). By understanding and effectively managing both cognitive and affective processes, firms can create a positive customer experience that drives satisfaction and loyalty.

Cognitive processes involve rational and analytical thinking, while affective processes involve emotions and feelings. Cognitive processes involve factors such as the quality of the product or service, the price, and the level of customer service. Customers may evaluate these factors based on their own personal criteria, such as their expectations or previous experiences with the firm. Affective processes involve factors such as emotions, feelings, and attitudes. Customers may feel a sense of attachment to a product or service based on how it makes them feel or the emotional benefits it provides. For example, a customer may feel a sense of satisfaction when using a product that is aesthetically pleasing or provides a sense of status or prestige. The experience of both cognitive and affective processes influences how customers

perceive and evaluate their overall satisfaction with a product or service. Therefore, this judgment results from a unique or accumulated experience with a service, consumption or use of a product, but also from the benefits offered by the firm (Jain et al., 2017; Paul et al., 2016).

Customers often have certain expectations when they purchase a product or service, and their satisfaction with the experience is largely based on how well those expectations are met. For customers to be satisfied, the actual experience of using the product or service must match or exceed their expectations. If the experience falls short of expectations, customers may be disappointed and less likely to be satisfied. Moreover, the expectation must be desirable and beneficial. Customers are more likely to be satisfied when the experience of using the product or service provides desirable and beneficial outcomes. This can include factors such as improved performance, increased convenience, or cost savings. Hence, achieving customer satisfaction requires meeting or exceeding customers' positive expectations and providing desirable and beneficial outcomes.

Economic value and satisfaction are two different concepts, but they are often related. Economic value refers to the value that an individual places on a particular product or service, based on how much they are willing to pay for it. On the other hand, satisfaction refers to the degree of pleasure or contentment that an individual experiences because of consuming a particular product or service. While economic value and satisfaction are distinct concepts, they are often related in the sense that a product or service that provides a high level of satisfaction is likely to be perceived as having a high economic value. Conversely, a product or service that provides low satisfaction is likely to be perceived as having a low economic value, and individuals may be less willing to pay for it. The economic value perceived as a benefit is clearly subject to judgment by customers and may facilitate the hypothesis of a continuing relationship between the customer and the firm due to the satisfaction generated (Hsieh et al., 2022; B. Zhang et al., 2017).

From this perspective, the economic value that customers benefit from their participation in co-creation environments can be seen as a reward for customer participation (Nadeem, Juntunen, et al., 2021; Nadeem et al., 2020). When customers receive economic benefits as a reward for their participation, it can increase their perception of the overall value they are receiving and can result in higher levels of customer satisfaction. This is because the positive, desirable, and beneficial expectations that customers had about their participation in the co-creation environment have been met or exceeded. By delivering on customers' positive expectations and providing valuable economic benefits, firms can create a positive customer experience that may translate into higher satisfaction because a positive, desirable, and beneficial expectation has been realized.

Previous research has shown that effective management of the perceived economic value provided to customers can have a significant impact on customer satisfaction, loyalty, and business success (Sminia et al., 2018; B. Zhang et al., 2017). For example, a study by Nadeem, Juntunen, et al. (2021) found that customer participation in co-creation led to increased perceived economic value, which in turn led to higher levels of satisfaction. Similarly, a study by Ramaswamy and Gouillart (2010) found that co-creation can enhance customer satisfaction by providing customers with unique and customized experiences. Finally, a study by Lindblom et al. (2020) found that perceived economic value was a significant predictor of customer satisfaction. Research has thus shown that there is a positive relationship between economic value and satisfaction.

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H13: Economic value is positively related to satisfaction.

On the other hand, relational value is the value that customers perceive from their relationship with a firm beyond the product or service itself. Relational value can be understood as the result of customers' involvement by their active engagement with firms providing goods and services (Barari et al., 2020; Carlson et al., 2018; Prahalad & Ramaswamy, 2004b). The relational value resulting from the co-creation experience can lead to a wide range of benefits that extend beyond the immediate influence of the relationship created during the co-creation process (Tran & Vu, 2021). It includes factors such as trust, commitment, loyalty, ongoing engagement and support, social interaction and a sense of shared ownership and responsibility.

Relational value and customer satisfaction are also closely related concepts. This is because customer satisfaction is not only influenced by the quality of the product or service provided, but also by the emotional aspects of the relationship between the firm and its participants. The formation of opinions and perceptions about the relationship between the firm and its participants is also influenced by the emotional aspects of the relationship (Rashid et al., 2021; Roberts et al., 2014; Sahi et al., 2017; Sánchez Fernández et al., 2013). Research has shown that the emotional experience of customers during interactions with the firm has a significant impact on their overall satisfaction with the relationship (Carlson et al., 2018; Carlson et al., 2019).

This emotional experience can be influenced by factors such as the level of trust, commitment, and empathy exhibited by the firm during interactions. When customers perceive high relational value in their relationship with a firm, they are more likely to feel invested in the relationship, have positive attitudes towards the firm. For example, customers may feel more satisfied when they perceive the firm as being trustworthy, reliable, and transparent. The reputation of the firm, as well as the perceived social and environmental responsibility of the firm, can also influence customer satisfaction. In addition, strong relational value can provide a buffer against negative experiences such as service failures or price increases, as customers may be more willing to forgive and remain loyal to a firm that they have a strong relationship with. The relational value perceived by customers is the most visible part and a strong ally for long-term business relationships (Chien et al., 2012).

Thus, perceived relational value is reflected positively in customer satisfaction (Carlson et al., 2018; Carlson et al., 2019; Flint et al., 2011; Spiteri & Dion, 2004). When participants perceive high levels of relational value, they are more likely to be satisfied with their relationship with the firm.

H14: Relational value is positively related to satisfaction.

2.4.3 Word-of-Mouth and Future Participation Intentions

Satisfaction is essential for the success of any firm, brand, product or service since it is reflected in the firm's economic profitability and market share (Ahmad & Buttle, 2002; Merlo et al., 2014). Satisfaction is the most important resource that firms have because it allows them to achieve competitiveness and ensure long-term success (Alkhurshan & Rjoub, 2020). Customer satisfaction can improve the firm's performance, which makes it crucial for the success of the business strategies they take in relation to the market they are inserted in (Baumgartner & Rauter, 2017; Slater & Narver, 1994). When a firm can satisfy its customers, it can improve its performance in several ways:

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1. Increased revenues: Satisfied customers are more likely to continue doing business with the firm and may even increase their spending over time. This can lead to increased revenues for the firm.
2. Cost savings: Satisfied customers are also less likely to require support or assistance from the firm, which can lead to cost savings in customer service and support.
3. Positive reputation: Satisfied customers are more likely to share positive feedback with others, which can lead to increased brand awareness and a positive reputation for the firm.
4. Competitive advantage: Satisfied customers can also give the firm a competitive advantage by providing positive reviews and recommendations to others, which can help the firm attract new customers and gain market share.

Satisfaction is one of the main determinants of customer behavior (Park et al., 2019; Sánchez García & Curras-Perez, 2019). When customers are satisfied with the value provided by the firm, they may be more likely to continue using the product or service, recommend it to others, and engage in repeat purchases. This is because engaged and satisfied customers have a positive perception of the firm and its products or services. They have experienced the value and benefits of the product or service, and they feel connected to the brand and its values. This can result in a continuing relationship between the customer and the firm, which can be beneficial for both parties. When customers are satisfied with the product or service they receive, they are more likely to continue doing business with the firm, which can lead to increased revenues and market share. Satisfaction is at the core of customer loyalty to the firm, but it is also a factor that ensures financial stability to the firm (Spiteri & Dion, 2004; Williams & Naumann, 2011; Yi et al., 2011). Research has shown that loyal customers are more profitable, spend more money, and are less likely to switch to competitors (Reichheld & Sasser, 1990).

However, customer satisfaction not only influences the customer's commitment to repurchase or future participation in firm initiatives but also has an impact on the message that current customers will pass on to other potential customers (Sahi et al., 2017). Satisfied customers are more likely to recommend the product or service to others, which can lead to increased brand awareness and market share. Customers become the firm's spokespeople and as a consequence, there is greater market penetration, commercial barriers are removed (elimination of suspicions that may exist in potential customers), increased loyalty, creation of beliefs that lead potential customers to get involved in the community in which evangelists are included (Alves et al., 2016). On the other hand, dissatisfied customers are more likely to switch to a competitor or share negative feedback about the experience. This can result in a negative impact on the firm's reputation and market share, as well as decreased customer retention and profitability.

Positive word-of-mouth refers to actions that are taken by consumers, firms, and influencers to create natural discussions and recommendations about a certain service or product to a target audience with the aim of gaining more customers for the firms (Anderson, 1998; Siahaan et al., 2022; Sweeney et al., 2020). Nevertheless, word-of-mouth communication can be both positive and negative, and both types of communication can have a significant impact on a firm's reputation and success. Positive word-of-mouth communication can lead to increased business, while negative word-of-mouth communication can lead to lost business and damage to the firm's reputation. Word-of-mouth communication is particularly important in today's digital age, where social media platforms and online review sites provide a powerful platform for participants to share their experiences with

others. Since positive word-of-mouth can act as a powerful marketing tool for co-creation initiatives, as it can generate interest and excitement in potential participants and stakeholders, firms must focus on increasing the likelihood of positive word-of-mouth communication.

Satisfaction and word-of-mouth together play a relevant role in strategic marketing communication planning (Berger, 2014; Subramanian, 2018). Satisfaction can be seen as the outcome of the customer's overall evaluation of the quality of the firm's products or services. This evaluation can be influenced by a variety of factors, including product performance, customer service, pricing, and convenience. Word-of-mouth, on the other hand, can be seen as a form of marketing communication that is based on personal experiences and trusted relationships. Regarding communications made by customers, firms have no influence and can hardly control the dissemination of information if it reaches large proportions (Berger, 2014; Ngoma et al., 2019; Sundar et al., 2017; Taghizadeh et al., 2013). Thus, word-of-mouth marketing is particularly powerful because it is based on trust and personal recommendations.

Word-of-mouth is how customers share their opinions, give indications and suggestions to other possible customers (Alves et al., 2016; File et al., 1992). This is because customers are evangelists of their experiences with firms regarding the service they have been provided with or the products they have been supplied with (Alves et al., 2016; File et al., 1992). Moreover, when customers become evangelists, they can help to remove commercial barriers that may exist for potential customers (Sweeney et al., 2020). This is because the recommendations of evangelists are often based on personal experience and trust, which can help to overcome any doubts or suspicions that potential customers may have about the product or service. When a friend or family member recommends a product or service, the recipient is more likely to trust that recommendation and consider making a purchase. This is because the recommendation comes from a trusted source, and the recipient may feel more confident in making a purchase based on the positive experience of someone they know. Moreover, when a customer recommends a brand, product or service to their friends or family, they are essentially putting their own reputation on the line. Thus, customers who are evangelists for a brand can help to create recognition and strengthen the brand's position in the market, because word-of-mouth recommendations from satisfied customers are often seen as more authentic and trustworthy than traditional marketing messages (Evangelista et al., 2022; Gerosa et al., 2021; Mvondo et al., 2022; Sweeney et al., 2020). As a result, potential customers may be more likely to trust the recommendation and try the product or service themselves. Hence, when customers share their positive experiences with others, they can help to create a positive reputation for the firm and attract new customers.

Moreover, word-of-mouth marketing can be highly cost-effective for firms. Unlike traditional marketing methods, such as advertising or promotions, word-of-mouth marketing does not require a large budget. Instead, it relies on the quality of the product or service and the satisfaction of customers to spread the word. This can be especially powerful in today's digital age, where social media and online reviews provide customers with a platform to share their opinions and recommendations with a wide audience, as it can help to increase the visibility and impact of the project, as well as foster a sense of excitement and enthusiasm among the participants. When customers are satisfied with a product or service, they are more likely to share their positive experience with friends, family, and colleagues, this can lead to a ripple effect, where others become interested in the brand, product or service and may eventually become customers themselves.

Word-of-mouth as a first-order, personal and direct means of communication, at the relationship level becomes the visible indicator of the "state of health" of firms with their customers (Dellarocas, 2003; Karmarkar & Pitbladdo, 1995; Ngoma et al., 2019). It reflects

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the "state of health" of the firm's relationships with its customers, as it is based on the customers' direct experiences with the firm and their willingness to share those experiences with others. This is due to the enormous power that word-of-mouth has in spreading information that can be relevant when transmitting opinions because it is through this medium that the satisfaction that customers feel is expressed (Giese & Cote, 2000; Sweeney et al., 2020; Xu, 2020). Thus, satisfaction is a key driver of word-of-mouth communication.

The level of satisfaction that consumers feel towards a firm has a strong impact on the messages that are conveyed when they are asked for their opinion (Kos Koklic et al., 2017; Sharma & Baoku, 2013; Shi et al., 2016). Consumers according to the level of satisfaction they feel, make recommendations and opinions of delight or regret (Giese & Cote, 2000; Sweeney et al., 2020; Xu, 2020). They may do so by sharing their positive experiences with friends and family, leaving positive reviews online, or recommending the firm to others. If a consumer is highly satisfied with a firm's products or services, they are more likely to convey positive messages about the firm when asked for their opinion. In addition, participants who are satisfied with the co-creation activities may be more likely to become "evangelists" for the project, meaning that they actively promote it to others and encourage them to get involved. Customers who feel engaged with the firm and satisfied with it become evangelists for the firm because they instantly think about recommending the brand, product or service that it sells, as well as advising others to buy its products or services (Merlo et al., 2014). This can have a significant impact on the firm's reputation and may lead to increased sales and customer loyalty. On the other hand, if a consumer is dissatisfied with a firm's products or services, they are more likely to convey negative messages when asked for their opinion. They may do so by sharing their negative experiences with friends and family, leaving negative reviews online, or warning others to avoid the firm. This can also have a significant impact on the firm's reputation and may lead to decreased sales and customer loyalty. Thus, satisfaction is crucial for the strategic level of the firm, because it strongly influences the opinion that its customers convey to others through word-of-mouth (Anderson, 1998; Anderson et al., 1994; Meilatinova, 2021; M. Zhang et al., 2017).

H15: Satisfaction is positively related to positive word-of-mouth.

Future participation refers to the intention of the participants or customers to collaborate again in the future in consumption experiences proposed by the firms or by the communities in which they are inserted (Chatterjee et al., 2021; Lim, 2001; Luzzini et al., 2015; Yoo et al., 2015). In other words, future participation refers to the likelihood or willingness of an individual to engage or participate in a particular activity or event in the future. This willingness to participate in the context of a co-creation environment can be an asset for the firm, as it can help them to gather important feedback and insights from their customers. This can help the firm to better understand their customers' needs and preferences, and to develop new products and services that meet those needs. On the one hand, this means that participants can spend more time involved in co-creation. Moreover, the desire to participate in future co-creation initiatives can lead to the development of a long-term relationship between participants and the initiative, thereby creating a sustainable ecosystem of co-creation.

Satisfaction typically refers to the feeling of contentment or fulfillment that an individual experiences because of a particular experience or situation. Consumers who are also satisfied with a product or service from a particular firm are more likely to participate in future initiatives that may occur (Kumar et al., 2018). When an individual is satisfied with their

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experience in a particular activity or event, they are more likely to have positive feelings towards it and to want to participate in it again in the future. Furthermore, satisfied customers may also actively seek out opportunities to do business with the firm again. In the previous line of thought, satisfied customers are more likely to do business again with firms that have served them well (Parasuraman et al., 1991; Williams & Naumann, 2011; Zeithaml et al., 2001). Therefore, satisfaction turns out to be the strong motivator of repurchase and customer engagement with firms in activities that are made available by them (Majeed et al., 2022).

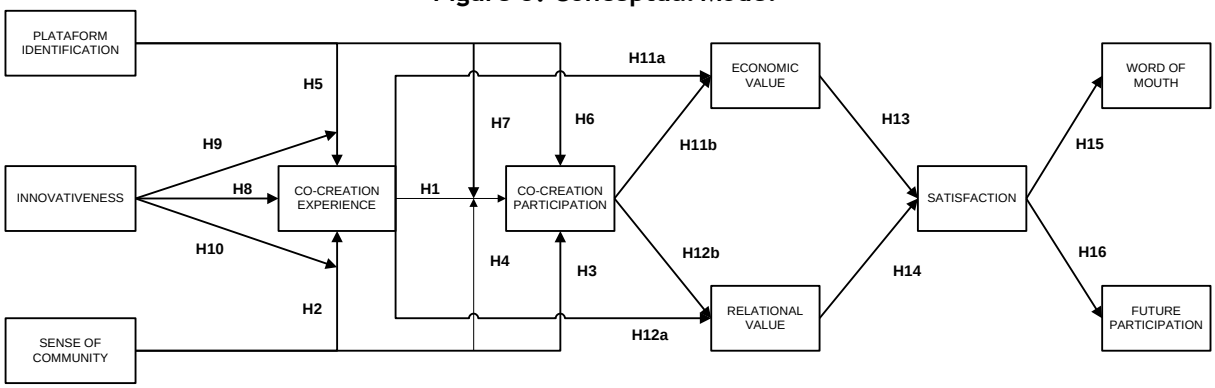
This can make them more willing to participate in future initiatives that the firm may offer. If a customer has a positive experience with a particular brand's product, they may be more likely to participate in a survey or focus group to provide feedback and suggestions for future product development. They may also be more willing to try new products or services that the brand offers in the future. Moreover, when participants have positive emotional experiences in co-creation activities, they are more likely to remain engaged and committed to the project over a longer period. Thus, high levels of satisfaction with an experience can often led to a greater likelihood of future participation. Conversely, low levels of satisfaction may decrease an individual's willingness to participate in similar activities or events in the future. If an individual is dissatisfied with their experience, they are less likely to want to participate again in the future and may even discourage others from participating as well. Customers who are not satisfied with a firm's products or services may need to be convinced to continue doing business with the firm. They may require additional incentives or reassurances to overcome their negative perceptions and regain confidence in the firm's offerings. Therefore, satisfaction can have a significant impact on future participation.

H16: Satisfaction is positively related to future participation.

2.5 RESEARCH MODEL: SUMMARY

Figure 5 shows the conceptual research model from which the various research hypotheses were developed. This model gave rise to two models focused on different aspects of co-creation and to each of them were associated the hypotheses that relate to them.

Figure 5. Conceptual Model



In Figure 6, Model 1 serves as a visual representation of the study's primary focus, delving into the intricate dynamics of co-creation within the context of antecedents and moderators. The central objective is to examine how these factors impact both co-creation experience and co-creation participation. The model provides a comprehensive framework that encapsulates the relationships between various elements, shedding light on the nuanced interplay between influential variables.

Antecedents and moderators, crucial components in this model, are systematically explored to understand their respective roles in shaping the co-creation landscape. These elements include the sense of community, platform identification, and innovativeness, each contributing uniquely to the overall co-creation process. The visual representation aids in conveying the complexity of these relationships and their potential influence on the outcomes of co-creation.

Figure 6. Co-Creation Antecedents and Moderators (Model 1): hypotheses

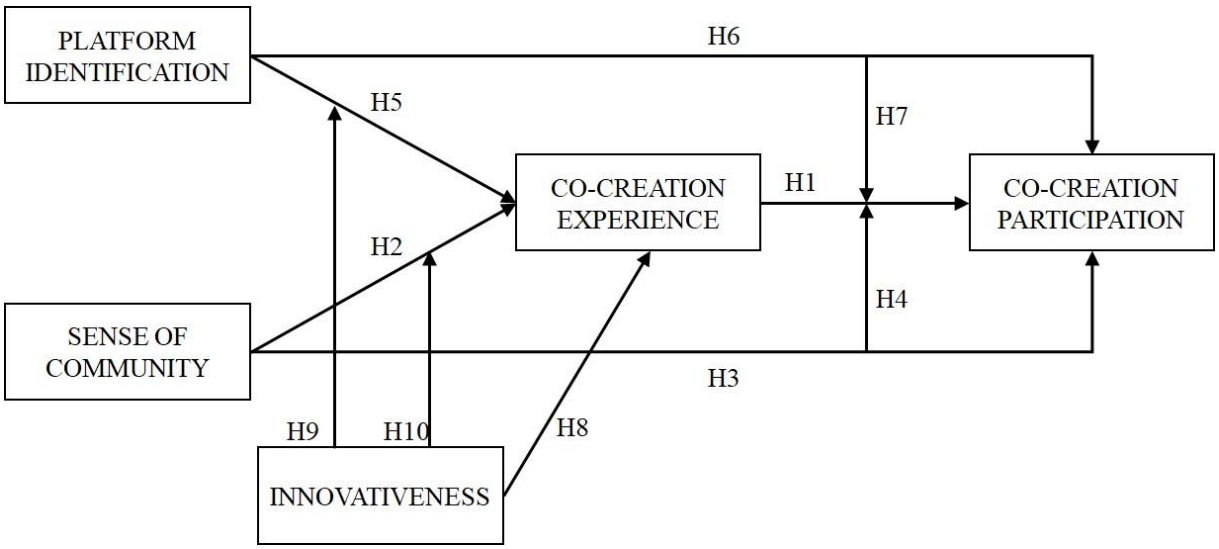


Table 14 shows the hypotheses that are schematically represented in model 1.

Table 14. Co-Creation Antecedents and Moderators (Model 1): hypotheses

H1: Co-creation Experience is positively related to Co-Creation Participation
H2: Sense of Community is positively related to Co-Creation Experience
H3: Sense of Community is positively related to Co-Creation Participation
H4: Sense of Community moderates the relationship between Co-Creation Experience and Co-Creation Participation
H5: Platform Identification is positively related to Co-Creation Experience
H6: Platform Identification is positively related to Co-Creation Participation
H7: Platform Identification moderates the relationship between Co-Creation Experience and Co-Creation Participation
H8: Innovativeness is positively related to Co-Creation Experience
H9: Innovativeness moderates the relationship between Platform Identification and Co-Creation Experience
H10: Innovativeness moderates the relationship between Sense of Community and Co-Creation Experience

Source: Own elaboration

Figure 7, show Model 2, as illustrated, assumes a pivotal role in this comprehensive study by shifting its focus towards investigating the consequences that arise from the intricate process of co-creation. Building on the groundwork laid by Model 1, which explored the antecedents and moderators of co-creation, Model 2 extends the analytical scope to unravel the outcomes and effects of engaging in collaborative value creation.

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Within the framework of Model 2, a detailed examination is undertaken to unravel the multifaceted consequences associated with co-creation. This includes an exploration of both direct and indirect effects emanating from the collaborative efforts of participants. Direct consequences encompass economic and relational benefits, shedding light on the tangible advantages that stem from active involvement in co-creation. Meanwhile, indirect effects, such as customer satisfaction, are meticulously examined for their role in shaping subsequent engagement and advocacy.

Figure 7. Co-Creation consequences (Model 2): hypotheses

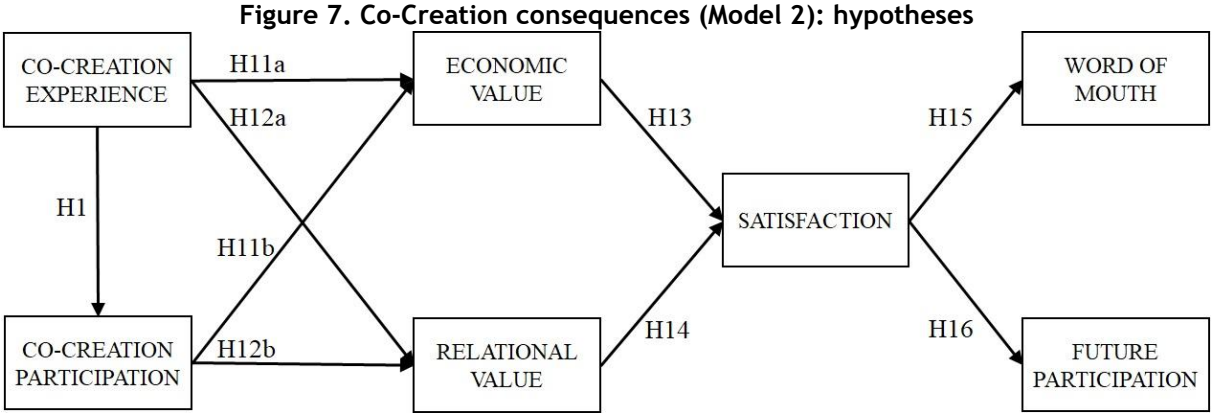

Table 15 shows the hypotheses that are schematically represented in model 2.

Table 15. Co-Creation consequences (Model 2): hypotheses

H11a: Co-Creation Experience is positively related to Economic Value
H11b: Co-Creation Participation is positively related to Economic Value
H12a: Co-Creation Experience is positively related to Relational Value
H12b: Co-Creation Participation is positively related to Relational Value
H13: Economic Value is positively related to Satisfaction
H14: Relational Value is positively related to Satisfaction
H15: Satisfaction have is positively related to Positive Word-of-Mouth
H16: Satisfaction have is positively related to Future Participation

Source: Own elaboration

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3 RESEARCH METHODOLOGY, DATA ANALYSIS, AND RESULTS

3.1 METHODOLOGY

In this section, the research methodology is presented to test our theoretical hypotheses with data collected for the empirical study. The data collection procedure and the measurement of the constructs are described.

3.1.1 Co-creation and Open-Source Software Development

Since the goal of this investigation is to increase the knowledge of SDL and co-creation, the framework of this study is open-source software (OSS) environments. To understand the difference between the traditional proprietary development method and the open-source development method, Raymond (1999) contrasted the two computational development methods as follows:

- The traditional proprietary development method is characterized by a closed, centralized approach, in which software is developed by a single firm or organization and distributed as a finished product to users. The development process is often shrouded in secrecy, and only authorized personnel have access to the source code. The software is typically sold for a price, and users are often required to sign licensing agreements that restrict how they can use the software.
- The open-source development method is characterized by an open, decentralized approach, in which software is developed collaboratively by a community of volunteers. The source code is freely available to anyone who wants to view, modify, or redistribute it. The development process is often transparent, with discussions and contributions from the community openly visible. The software is typically distributed under a license that allows users to use, modify, and distribute the software freely.

The main difference between the two approaches lies in the way they view and treat intellectual property. The proprietary approach views software as a proprietary product that is owned and controlled by a single entity and is typically sold for profit (Kilamo et al., 2012). In this approach, the source code is often kept secret and closely guarded, and modifications to the software are tightly controlled.

On the other hand, the open-source approach views software as a shared resource that is collaboratively developed and improved by a community (Hemetsberger & Reinhardt, 2009, 2016). These communities are often made up of developers, users, and other interested parties who collaborate to create and improve software in a decentralized manner. In this approach, the source code is typically made publicly available and freely accessible, and users are encouraged to modify and distribute the software as they see fit. The goal of the open-source approach is to create high-quality software that is freely available to everyone, and that can be modified and improved by anyone who has the skills and knowledge to do so.

These different approaches to intellectual property are reflected in the different licensing models used by open-source and proprietary software. Proprietary software is typically protected by copyright and other forms of intellectual property law and is subject to restrictive licensing agreements that limit its use and distribution. In contrast, OSS is typically licensed under permissive licenses, such as the MIT or Apache licenses, which allow users to freely use, modify, and distribute the software, often with few restrictions.

The different approaches to intellectual property reflect fundamental differences in philosophy and values between the open-source and proprietary development methods. The

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proprietary approach emphasizes control, ownership, and profit, while the open-source approach emphasizes collaboration, community, and the free exchange of ideas and knowledge (Hemetsberger & Reinhardt, 2009, 2016).

Open-source and proprietary platforms have always co-existed since the early days of the computing industry, but the emergence of the Internet in the 1990s has led to intensified competition between these two computing methods (Casadesus-Masanell & Heilbron, 2015; Casadesus-Masanell & Llanes, 2015). The 1990s created new opportunities for both open-source and proprietary platforms, but it also highlighted the differences between the two methods. On one hand, the Internet made it easier for open-source software to be distributed and collaborated on globally, which helped it gain popularity and support. On the other hand, proprietary platforms saw the Internet as a new market for their products and services, and many of them adapted their strategies accordingly.

The open-source movement has made significant inroads into the field (von Hippel & von Krogh, 2003; von Krogh & Spaeth, 2007; von Krogh & von Hippel, 2003), a strong foothold over the years in many industries, particularly in the realm of web development and cloud computing. Firms like Google, Facebook, and Amazon heavily rely on OSS to build their platforms and services. Meanwhile, proprietary platforms like Microsoft and Apple have also adapted to the Internet age and continue to thrive in their respective markets. Thus, the competition between open-source and proprietary platforms continues to be an important aspect of the computing industry, and each method has its own strengths and weaknesses (Wang et al., 2020; West, 2003).

Proprietary platforms often have the advantage of being backed by a dedicated team of developers and support staff, which can result in faster development cycles and more reliable software (Abrahamsson et al., 2017). Additionally, proprietary platforms often come with comprehensive support and documentation, which can be helpful for users who are less experienced with the technology. Finally, proprietary platforms may offer greater security features, since the source code is often closely guarded and subject to rigorous security testing. However, proprietary platforms also have some weaknesses. They can be more expensive than OSS, and they may not be as customizable or flexible. Additionally, proprietary platforms can be more difficult to troubleshoot, since the source code is not available to the public.

Open-source platforms, on the other hand, key advantages are many, namely: OSS is often free to use and distribute, which can save organizations money; OSS is developed collaboratively by a large community of developers, which can lead to more robust and reliable software; OSS can be customized and modified to meet specific needs, since the source code is available to anyone who wants to contribute, which gives organizations more flexibility; OSS is often more secure than proprietary software because it is more transparent and can be reviewed by a wider audience; OSS can help organizations to avoid vendor lock-in and gives them more freedom to choose the software that best meets their needs; OSS can facilitate collaboration between organizations and individuals, leading to greater knowledge sharing and innovation; and finally, OSS can improve an organization's reputation and brand image by demonstrating its commitment to transparency, collaboration, and innovation. These advantages make OSS an attractive option for organizations of all sizes. However, open-source platforms can also have some weaknesses. They may not be as well-supported as proprietary platforms, and they may not be as secure.

Here are some additional details about the advantages of open-source software:

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- Cost savings: OSS is often free to use and distribute, which can save organizations a significant amount of money on software licensing fees. This is especially beneficial for small businesses and organizations with limited budgets.
- Flexibility: OSS can be customized and modified to meet specific needs, which gives organizations more flexibility than proprietary software. This can be important for organizations that need to adapt their software to changing requirements.
- Security: OSS is often more secure than proprietary software because it is more transparent and can be reviewed by a wider audience. This is because the source code for open-source software is freely available, so anyone can inspect it for potential security vulnerabilities.
- Vendor independence: OSS does not require organizations to be locked into a particular vendor, which gives them more freedom to choose the software that best meets their needs. This can be important for organizations that want to avoid vendor lock-in or that need to be able to switch vendors easily.
- Collaboration: OSS is often developed collaboratively by a large community of developers, which can lead to greater knowledge sharing and innovation. This is because the source code for OSS is freely available, so anyone can contribute to its development.
- Reputation and brand image: Organizations that use OSS may be viewed more favorably by customers and stakeholders who value transparency, collaboration, and innovation. This is because open-source software is often seen as a more ethical and sustainable way to develop software.

Ultimately, the best choice of platform will depend on the specific needs of the user or organization. If cost is a major factor, then OSS may be the better option. If security is a major concern, then a proprietary platform may be the better option. However, in most cases, the best choice is to use a combination of open-source and proprietary software. This can allow users to get the best of both worlds, in terms of cost, security, and flexibility.

Since OSS development is a collaborative process where software is developed and maintained by a community of contributors who work together to improve the software, according to Stewart and Gosain (2006) and complemented by Daniel and Stewart (2016), open-source communities have a common ideology that leads to specific norms, beliefs, and values that participants share and unite them to help each other and share their knowledge. This ideology is reflected in the norms, beliefs, and values of the community, which help to guide the behavior of participants and promote a sense of common purpose (Frluckaj et al., 2022; Li et al., 2021; Yue et al., 2021). The tenets of open-source ideology generally include:

- Openness - The source code of OSS is freely available to anyone who wants to use, modify, or distribute it. This openness allows for transparency, collaboration, and innovation.
- Collaboration - OSS is developed and maintained by a community of contributors. This collaboration helps to ensure that the software is of high quality and meets the needs of a wide range of users.
- Transparency - The development process of OSS is transparent, meaning that anyone can see how the software is being developed and who is contributing to it. This transparency helps to build trust and ensures that the software is accountable to the community.
- Meritocracy - Contributions to open-source projects are judged based on their quality and usefulness, rather than on factors such as job title, academic degrees, or

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seniority. This meritocracy helps to ensure that the best ideas and solutions are adopted.

- Community-oriented - OSS is developed for the benefit of the community, rather than for the profit of a single firm or individual. This community-oriented approach helps to ensure that the software is sustainable and meets the needs of a wide range of users.
- Sharing - Open-source communities are characterized by a strong emphasis on sharing knowledge and resources. This sharing helps to accelerate the pace of innovation and development.
- Free and open distribution - OSS should be freely available to anyone who wants to use it, modify it, or distribute it, without any restrictions or limitations.
- Flexibility - Open-source ideology encourages software that is flexible and can be adapted to meet the needs of different users and organizations.

Together, these norms, beliefs, and values help to create a unique culture within open-source communities that fosters collaboration, innovation, and the free exchange of ideas. Table 16 shows the perspective from Stewart and Gosain (2006).

Table 16. Tenets of Open-Sources Ideology

OSS Norm	OSS Beliefs	OSS Values
Forking – there is a norm against forkink a project, which refers to splitting the project into two or more projects developed separately. Distribution – there is a norm against distributing code changes without going through the proper channels. Name Credit – there is a norm against removing someone's name from a project without that person's consent.	Code Quality – open-source development methods produce better code than closed source. Software Freedom – outcomes are better when code is freely available. Information Freedom - outcomes are better when information is freely available. Bug fixing – the more people working on the code, the more quickly bugs will be found and fixed. Practicality - practical work is more useful than theoretical discussion. Status Attainment - status is achieved through community recognition.	Sharing – sharing information is important. Helping – aiding others is important. Technical knowledge - technical knowledge is highly valued. Learning – there is a value on learning for its own sake. Cooperation – voluntary cooperation is important. Reputation – reputation gained by participating in open-source projects is valuable.

Source: Own elaboration based on Stewart and Gosain (2006)

As a result, norms, beliefs and values are seen as building blocks of ideology and OSS norms state that projects should not be bifurcated, meaning that a project should not be split into two or more separately developed projects, as well as the identity of the contribution made by each one is preserved, so there is no removal of the project history name, maintainer or credit list if that person has not clearly approved it (Stewart & Gosain, 2006).

Co-creation in open-source software refers to the collaborative process of creating software that is developed and maintained by a community of contributors, rather than by a single firm or individual (Peters et al., 2022). In this process, anyone can participate in the development of the software, by contributing code, testing, documentation, and other resources. Co-creation in OSS can also involve user feedback and input, as users can report bugs, suggest improvements, and provide feedback on the software's performance and usability (Peters et al., 2022). This feedback can then be incorporated into the development process, helping to improve the software and make it more user-friendly.

The co-creation that takes place in OSS communities is a critical aspect of their success, as it enables participants to collaborate and contribute to the development of high-quality software solutions that are tailored to the needs of a diverse range of users (Füller et al., 2011) This approach allows for a much greater degree of innovation and experimentation than traditional software development models, as it leverages the collective wisdom and expertise of a broad community of participants.

While there may be some differences between co-creation and OSS communities, both involve active participation from partners in the development process, with the goal of creating better products and services. In co-creation, customers are actively involved in the product development process, working alongside firms to create new products and services that better meet their needs. This process often involves various stages of collaboration, from ideation to prototyping and testing. Similarly, in OSS communities, participants actively participate in the development process by contributing their technical expertise and resources, such as code, documentation, and user support. This process often involves various stages of collaboration, such as feature requests, bug reports, and code reviews. Thus, co-creation customers and community participants are considered partners in the development of new products and services (Romero & Molina, 2011). In both situations, they are involved in the various stages of development and actively participate in all that can participate, and their involvements in the development process helps ensure that the final product better meet the needs of the end-users or customers. Consequently, like co-creation, OSS communities are centered on their participants, because they rely on them to develop the products they manage as well as provide the support services they provide (Zwass, 2010).

In this line, another similarity between co-creation and OSS communities is that both recognize the value of user input in the development process and seek to personalize services to better meet the needs and preferences of the end-users (Nagle, 2018). The personalization of the services gives freedom to those who will enjoy the software developed by the communities to use all their creative potential, knowledge, ability and skills to express their opinions and suggestions that may result in improvements of the functionality of software in development (Bitner et al., 1997; Bonaccorsi & Rossi, 2003; Meuter et al., 2000; Zhou & Choudhary, 2022). Intensive communication between all participants in OSS communities and sometimes between inter-communities is also a result of personalization of services and user involvement (Franco-Bedoya et al., 2017; Linåker et al., 2018). Therefore, while there may be some differences between co-creation and OSS communities, both recognize the importance of personalizing services and giving users the freedom to express their opinions and suggestions to improve software functionality. In co-creation, effective communication between customers and firms helps ensure that the product development process is collaborative, transparent, and aligned with customer needs. Similarly, in OSS communities, effective communication between participants helps ensure that the software development process is collaborative, efficient, and responsive to user needs (Fernandes & Remelhe, 2016; Iskoujina & Roberts, 2015; Uppström & Lönn, 2017). Furthermore, intensive communication

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in OSS communities helps facilitate collaboration between developers and users, which can lead to a better understanding of user needs and more effective problem-solving. Therefore, effective communication is essential for both co-creation and OSS communities, as it helps facilitate personalization of services and user involvement in the development process (Dellaert, 2019; Kaur et al., 2020). In both cases, intensive communication between all participants in the communities and sometimes between inter-communities is necessary to personalize services and involve users in the development process.

Active participation is highly desirable in OSS development communities and is encouraged and appreciated by the community. However, OSS community participants can be passive users and they may be registered in communities but not contribute code or suggestions (Choi et al., 2015; Hsieh et al., 2022). This passive participation can still be valuable and contribute to the overall success of the community (Yan et al., 2019). Thus, it is also important to recognize the value of passive participation, as passive users can still provide important feedback and insights into the usability and functionality of the software being developed (Franco-Bedoya et al., 2017; Kaur et al., 2020; Link & Jeske, 2017). Even if participants do not contribute actively to the development process, their use of the software and feedback can provide important insights into user needs and help identify bugs and other issues. Furthermore, some participants may contribute to the community in other ways, such as by providing user support, creating documentation, or promoting the software to others (Logue & Grimes, 2022). These contributions are also valuable and can help improve the quality and usability of the software. The key is to have a diverse range of participants with different skill sets and levels of involvement, as this can help ensure a healthy and thriving community.

In short, OSS communities are a fine example of how co-creation works. In the opinion Gustafsson et al. (2012), all principles for the co-creation and SDL communities are based on the principles of technology-related communities (Baron & Harris, 2008; Lusch & Vargo, 2014; Vargo & Lusch, 2004a).

Lastly, diverse approaches exist for classifying OSS, but a prevalent method entails the differentiation between Commercial Open-Source Software (COSS) and Community OSS (Riehle, 2007).

COSS resides within the broader realm of OSS, yet it distinguishes itself by its genesis and backing from commercial entities with business-oriented goals (August et al., 2021). Prominent names like Red Hat, MySQL, and Docker exemplify firms that fashion and disseminate such software. Geared towards meeting the specific demands of organizations, this software is complemented by supplementary services encompassing customer support, training, timely updates, bug rectifications, and advanced enterprise-centric features, all available at a fee.

A tangible boon linked to COSS is its potential for yielding cost efficiencies. Although the initial investment might surmount that of the unremunerated version, the sustained expenditures associated with maintenance and support often taper down. Furthermore, COSS acts as a buffer, shielding businesses from the perils of security susceptibilities and regulatory non-compliance.

Notwithstanding these merits, caveats warrant consideration. Foremost among these is the possible heightened cost compared to OSS offered free of charge. Additionally, enterprises might find themselves entwined with a singular vendor, rendering the transition to alternative solutions a convoluted endeavor. Consequently, despite its open-source nature, COSS diverges in terms of support mechanisms, feature sets, and licensing stipulations when contrasted with other iterations.

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A pivotal distinction manifests in the fact that COSS commonly derives support and maintenance from commercial enterprises (West & Gallagher, 2006). Conversely, alternative genres of OSS often rely on collaborative community support for sustenance and updates. Moreover, COSS often boasts a panoply of added features that set it apart from its open-source counterparts (Mader et al., 2020; Ohm et al., 2020). This divergence emanates from the substantial resource allocation by commercial entities toward refining the software's competitiveness and attractiveness for businesses. It's noteworthy that licensing terms for COSS might also deviate from the norms of other open-source software. While both genres usually adhere to open-source licenses enabling code dissemination and adaptation, COSS might incorporate supplementary clauses constraining commercial deployment or distribution.

Two principal archetypes of open-source software licenses are discernible: copyleft and permissive (Barron, 2013; Duparc et al., 2022).

Copyleft licenses mandate that derivatives adhere to the same licensing framework, thereby preserving the software's open-source essence and ensuring that the collaborative benefits endure (GNU General Public License - GPL, Lesser GNU Public License - LGPL).

In contrast, permissive licenses offer greater leeway, as they don't impose a requirement for derivatives to uphold the parent license. This confers developers with more latitude in utilizing the software, yet it may also undermine the software's sustained open-source character (BSD license, MIT license).

The optimal license selection hinges on the project's individual exigencies. For initiatives that prioritize the perpetuation of open-source ideals, copyleft licenses present the superior choice. Conversely, when projects aim to empower developers with greater autonomy over usage, permissive licenses emerge as the preferable alternative.

Table 17 summarizes the key differences between copyleft and permissive licenses.

Table 17. The key differences between copyleft and permissive licenses

Feature	Copyleft Licenses	Permissive Licenses
Requirement for derivative works	Derivative works must be released under the same license.	Derivative works can be released under any license.
Ensuring that software remains open-source	More secure	Less secure
Freedom for developers	Less freedom	More freedom
Examples	GPL, LGPL	BSD, MIT

Source: Own elaboration based on Barron (2013) and Duparc et al. (2022) texts

3.1.2 Sample and Data Collection Procedure

The SDL is a business theory that views customers as co-creators of value. This means that customers are not passive recipients of value, but rather they actively participate in the creation of value. For example, customers can provide feedback on products and services, or they can contribute their own ideas for new products and services.

Co-creation is the process of creating value together. It is a collaborative process that involves customers, businesses, and other stakeholders. Co-creation can take many forms, such as customer feedback, crowdsourcing, and open innovation.

Linux distributions are an excellent environment for studying the SDL and co-creation. This is because Linux distributions are OSS, which means that they are developed and

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maintained by a community of people. The community is made up of people from all over the world who contribute their time and expertise to improve Linux. This diversity of participants creates an environment where ideas and insights can be freely exchanged, which is essential for the co-creation of value. This collaboration has resulted in a high-quality, reliable, and affordable operating system that is used by millions of people around the world. Thus, the Linux community is a good example of co-creation.

Here are some specific ways in which the diversity of participants in Linux distributions contributes to the co-creation of value:

- It helps to ensure that a wide range of perspectives are considered - when different people with different experiences and knowledge work together, it is more likely that value opportunities will be identified that would not be perceived by a single individual or group.
- Diversity of participants can help promote innovation - when people are exposed to new ideas and perspectives, they are more likely to think differently and generate new solutions to problems.
- Diversity of participants can help build trust and cooperation - when people get involved in joint projects, they could learn to work together and respect each other's perspectives. This can lead to stronger relationships and better collaboration in the future.

The integration of tangible and intangible resources is essential to create value effectively. Tangible resources, such as products, services, and infrastructure, provide the foundation for value creation. Intangible resources, such as knowledge, skills, and relationships, enable businesses to make the most of these resources.

Customers and businesses collaborate in a variety of ways to create value. Firms can use customer insights to develop products and services that meet their needs. Customers can provide feedback to businesses on their products and services, which can help them to improve continuously.

The study of the SDL and co-creation in a Linux environment can provide valuable insights into how these concepts can be applied in other contexts. Moreover, the use of free and commercial Linux distributions in the study of SDL and co-creation can provide valuable insights into how these concepts can be applied in a variety of contexts.

Free Linux distributions are an excellent example of how SDL and co-creation can be used to create a valuable system. These distributions are developed and maintained by a community of volunteers who contribute their skills and knowledge to improve the system. This collaboration allows free Linux distributions to constantly evolve and improve, providing value to a wide range of users.

Commercial Linux distributions, on the other hand, provide an example of how SDL and co-creation can be used to create a valuable product. These distributions are developed and maintained by businesses that use customer insights to develop products that meet the needs of their target market. Businesses also collaborate with other organizations, such as open-source communities, to improve their products.

By studying the use of free and commercial Linux distributions, the study can gain a better understanding of how SDL and co-creation can be used to create value in a variety of contexts.

Six Linux distributions and copyleft licenses are used in this study:

- Debian is one of the oldest and most popular Linux distributions. It is known for its stability and reliability.

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- Ubuntu is a Linux distribution based on Debian. It is easier to use than Debian and is a good option for beginners.
- Fedora is a Linux distribution developed by the Fedora community. It is known for its innovation and adoption of new technologies.
- Red Hat Linux is a commercial Linux distribution based on Fedora. It is the most popular Linux distribution for firms and users.
- SUSE Linux is a commercial Linux distribution based on openSUSE. It is a good option for firms and users looking for a stable and secure Linux distribution.
- IPBrick is a commercial Linux distribution based on Debian. It is a good option for firms looking for a customized Linux distribution.

Consequently, the data collection for this study occurred between June 15, 2018, and August 26, 2018. Respondents were users enrolled in Linux forums for free OSS and COSS distributions. The paid distributions included Red Hat, IPBrick, and SUSE. The free distributions included Fedora, Debian, and Ubuntu.

The study was disseminated, and data was collected directly in the official forums of each distribution, except for IPBrick. The dissemination and data collection for IPBrick was done in the forum www.linux.org because its official forum (forum.ipbrick.com) was discontinued. In this specific case, only users who could be identified as IPBrick users were selected for the study. However, this does not invalidate the fact that there may be more users of this distribution in this forum and in others.

The geographical scope of the study covered Europe and the Americas. However, some respondents indicated that they were residing in Morocco. This is likely because they had registered for the forums as residents of a European or American country. This is a common practice, as it allows users to access discussions that are more relevant to their geographical area. For example, French speakers from North Africa may indicate that they live in France when they register for a forum.

The study considered that users participate in the forums with different levels of experience and activity. Therefore, no one was discriminated against based on these factors. The respondents were selected using a probabilistic quota method based on the number of posts that each user had published. This meant that the following percentages of users were selected for the study:

- Passive users: 20% (users without contributions).
- Ordinary/undifferentiated users: 60% (users with at least one contribution).
- Platform programmers/dedicated support technicians: 20% (usually users with a high number of posts because they give feedback to suggestions/requests for help and contribute with new ideas).

In each community, the user selection process adhered to the percentage that was initially set for each group. Within each group, all users had an equal chance of being selected. Each user was assigned a sequential number. The selection was made using an algorithm that randomly selected numbers in each group up to the defined limit.

The users who were selected received a message to help them complete the questionnaire. Users with a significant number of contributions received more than one message to participate, as they are more likely to be interested in the study. The message sent was:

> "I hereby invite you to fill out the online questionnaire which is available in the surveys section entitled "USC.es - Service Dominant Logic and Co-Creation".

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> The survey is aimed at completing the PhD course in Business Management, attended by the student António Rebelo, University of Santiago de Compostela - Spain.
> The identity of the respondents shall be confidential, unless you authorize disclosure in accordance with the GDPR.
> Thank you for your cooperation."

The following table provides a summary of the population, data collection methods, collection period, population size, and number of respondents for the questionnaire.

Table 18. Sample description

Population	Linux users who are enrolled in the official forums of Red Hat, IPBrick, SUSE, Fedora, Debian, and Ubuntu.
Location	Europe and American Continent
Data collection procedure	The questionnaire was disseminated, and data was collected directly in the official forums of each distribution, except for IPBrick. The dissemination and data collection for IPBrick was done in the forum www.linux.org because its official forum (forum.ipbrick.com) was discontinued.
Respondents	Users of private firms, public administration, freelancers, students and retirees.
Field work	The questionnaire was available for completion from June 15, 2018, to August 26, 2018.
Population size	The total number of unique Linux users who were selected in the official forums of the six distributions is 1,662.
Sample size	683 valid questionnaires.
Response rate	41.1%

Source: Own elaboration

The table below provides a comprehensive overview of the statistics related to eligible Linux users of each distribution as of June 15, 2018. It includes the count of eligible users, the total number of invitations that were sent out, the quantity of users who actively responded to the invitations, and, significantly, the ratio illustrating the proportion of responses obtained in relation to the total number of invitations extended.

These data points are instrumental in gauging the effectiveness of the questionnaire's outreach and user engagement, shedding light on the level of participation and response rates. This information serves as a valuable metric for assessing the degree of user interaction and involvement in the survey, offering insights into the extent of user interest and the questionnaire's impact.

Table 19. Respondents

Design	Distribution	Eligible User	Invitations Sent	Answers Collected	Response Rate
Common	Fedora	4,133	300 (Max. allowed)	197	66%
	Ubuntu Free	3,656	300 (Max. allowed)	198	66%
	Debian	3,941	300 (Max. allowed)	108	36%
Firm	Red Hat	4,837	300 (Max. allowed)	52	17.33%
	Suse	3,629	300 (Max. allowed)	82	27.33%
	IPBrick	162	162	46	28.4%
Total		**20,358**	**1,662**	**683**	**41.1%**

Source: Own elaboration

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The table shows that there was a positive response from the respondents. Of the 1,662 invitations sent, 683 collaborated with the study and fully answered the questionnaire, which in terms of proportion corresponds to 41.1% of the invitations sent.

The following table shows the number of users who responded for each Linux distribution, as well as the percentage that each distribution represents in the total responses.

Table 20. Respondents by Linux Distributions

Design	Linux Distribution	N	%
Common	Fedora	197	28.84%
	Ubuntu Free	198	28.99%
	Debian	108	15.81%
Firm	Red Hat	52	7.61%
	Suse	82	12.01%
	IPBrick	46	6.74%
Total		**683**	**100%**

Source: Own elaboration

Users of free/common distributions were the most collaborative, with Fedora users (28.84%) and Ubuntu users (28.99%) being the most represented. In commercial distributions, users of the Suse distribution (12.01%) were the most collaborative.

The following table shows the distribution of respondents by distribution type:

Table 21. Respondents by Common and Firm development

Design	N	%
Common	503	73.6
Firm	180	26.4
Total	**683**	**100.0**

Source: Own elaboration

It was also found that users of free/common distributions participated the most in the study, with a participation rate of 73.6%, compared to 26.4% for paid distributions.

The possibility of non-response bias was examined using the guidelines of Armstrong and Overton (1977) to test for significant differences between early and late respondents. Early responses are defined as the first 75% of returned questionnaires, and the last 25% of late responses are intended to be representative of users who did not respond to the survey (Weiss & Heide, 1993). A series of tests were conducted with these two groups on several key respondent characteristics, such as years of collaboration (p=0.342), number of contributions (p=0.136), gender (p=0.708), age (p=0.498), level of studies/graduation (p=0.687), work status (p=0.913), work type (p=0.533), and migrant status (p=0.999). The results showed no significant differences between respondents and non-respondents at the 0.05 level, suggesting that non-response bias was not a problem.

3.1.3 Measurement of Constructs: Scales and Questionnaire Development

In the pursuit of effective data collection, a meticulously crafted structured questionnaire was designed. Extensive research within the academic literature was carried out to meticulously select constructs with a robust history of utilization by experts in the field, ensuring their suitability for the study at hand. In certain instances, careful linguistic refinements were introduced to enhance the clarity and comprehensibility of the items

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featured in the questionnaire. Importantly, it is noteworthy that these nuanced adjustments did not compromise the questions' inherent validity or intended meanings.

In this study, the variables were meticulously operationalized by employing well-established scales with a history of prior validation. These scales were thoughtfully assessed on a 7-point rating scale, with responses ranging from 1 (Strongly disagree) to 7 (Strongly agree). For the examination of the co-creation experience, the research team adhered to the guidance and instructions set forth by Dahl and Moreau (2007) and (Füller et al., 2011). It's worth noting that second-order constructs, specifically Autonomy, Competence, and Task Enjoyment, were employed in the study to delve into the intricate dynamics of the research domain.

The following table shows the different constructs considered, the literature sources for each scale, and the number of items:

Table 22. Constructs, Source and Number of Items

CONSTRUCTS		SOURCE	Nº ITEMS
Platform Identification		Homburg et al. (2009)	5
Sense of Community		Gebauer et al. (2013)	5
Innovativeness		Im et al. (2007) and Kirton (1976)	11
Co-Creation Experience	Competence	Dahl and Moreau (2007) and Füller et al. (2011)	4
	Autonomy	Dahl and Moreau (2007) and Füller et al. (2011)	4
	Task Enjoyment	Dahl and Moreau (2007) and Füller et al. (2011)	6
Co-Creation Participation		Yim et al. (2012)	5
Economic Value		Chan et al. (2010)	5
Relational Value		Chan et al. (2010)	3
Satisfaction		Chan et al. (2010)	4
Word-of-Mouth		Gebauer et al. (2013)	3
Future Participation		Füller et al. (2009)	4

Source: Own elaboration

The next table shows the different constructs considered, literature sources for each scale and items considered in each construct.

Table 23. Constructs, Source and Items

CONSTRUCTS	SOURCE	ITEM
Platform Identification	Homburg et al. (2009)	A.1 - I strongly identify with this platform.
		A.2 - I feel good to be user of this platform.
		A.3 - I like to tell that I am user of this platform.
		A.4 - This platform fits well to me.
		A.5 - I feel attached to this platform.
Sense of Community	Gebauer et al. (2013)	B.1 - I consider myself as a member of this Community.
		B.2 - I think this Community platform is a good place

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CONSTRUCTS		SOURCE	ITEM
			to spend my spare time.
			B.3 - I feel closely connected to other participants of this Community.
			B.4 - I feel a sense of kinship with other Community members.
			B.5 - I have a strong desire to further interact with participants of this Community.
Innovativeness		Im et al. (2007) and Kirton (1976)	C.1 - I often risks doing things differently.
			C.2 - I have original ideas.
			C.3 - I cope with several ideas at the same time.
			C.4 - I proliferate ideas.
			C.5 - I have fresh perspectives on old problems.
			C.6 - I am stimulating.
			C.7 - I will always think of something when stuck.
			C.8 - I can stand out in disagreement against a group.
			C.9 - I would sooner create than improve.
			C.10 - I like to vary set routines at a moment's notice.
			C.11 - I need the stimulation of frequent change.
Co-Creation Experience	**Competence**	Dahl and Moreau (2007) Füller et al. (2011)	D.1 - Participation in the development of the platform made me feel smart.
			D.2 - Participation in the development of the platform made me feel competent.
			D.3 - Participation in the development of the platform made me feel talented.
			D.4 - Participation in the development of the platform made me feel intelligent
	Autonomy	Dahl and Moreau (2007) Füller et al. (2011)	E.1 - I had a great deal of freedom to make choices when participating in the development of the platform.
			E.2 - I was able to express myself when participating in the development of the platform.
			E.3 - I felt controlled when participating in the development of the platform. (R)
			E.4 - I felt pressured when participating in the development of the platform. (R)
	Task Enjoyment	Dahl and Moreau (2007) Füller et al. (2011)	F.1 - I enjoyed participating in the development of the platform.
			F.2 - I had a good time participating in the development of the platform.
			F.3 - Participation in the development of the platform was a lot of fun.
			F.4 - Participation in the development of the platform was very satisfying.
			F.5 - I felt annoyed when participating in the development of the platform. (R)
			F.6 - I felt frustrated when participating in the development of the platform. (R)
Co-Creation Participation		Yim et al. (2012)	G.1 - I spent a lot of time-sharing information about my needs and opinions with the staff during the service process.

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CONSTRUCTS	SOURCE	ITEM
		G.2 - I put a lot of effort into expressing my personal needs to the staff during the service process.
		G.3 - I always provide suggestions to the staff for improving the service outcome.
		G.4 - I have a high level of participation in the service process.
		G.5 - I am very much involved in deciding how the services should be provided.
Economic Value	Chan et al. (2010)	H.1 - My participation helps me receive higher quality service.
		H.2 - My participation helps me receive more customized service.
		H.3 - My participation helps me receive more professional service.
		H.4 - My participation helps me receive more control over the services quality.
		H.5 - My participation helps me receive less service failure.
Relational Value	Chan et al. (2010)	I.1 - My participation helps me build a better relationship with the service provider.
		I.2 - My participation makes the service interaction more enjoyable.
		I.3 - My participation helps me receive relational approval from the service provider.
Satisfaction	Chan et al. (2010)	J.1 - I am satisfied with the services provided.
		J.2 - This platform is a good option to do business with.
		J.3 - The service of this platform meets my expectations.
		J.4 - Overall, I am satisfied with the service provided by this platform.
Word-of-Mouth	Gebauer et al. (2013)	K.1 - I say positive things about this platform to other people.
		K.2 - I recommend this platform to someone who seeks my advice.
		K.3 - I can recommend this platform without any concerns.
Future Participation	Füller et al. (2009)	L.1 – I am interested in participating in other projects
		L.2 – I am Interested to propose more ideas in the next events
		L.3 – I am Interested in making new discoveries
		L.4 – I am interested in customizing more the experience

Note: (R) – reversed sense / Source: Own elaboration

This section expounds upon the research methodology employed for rigorously examining the theoretical hypotheses based on the collected data in order to conduct the empirical study. It delves into the intricacies of the data collection process, providing a comprehensive and detailed account of the methods and procedures applied.

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3.2 Analysis and Results

This section provides a statistical description of the collected data. The conceptual models were tested using Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM). The results of each conceptual sub-model analysis are presented at the end of this section. All analyses were conducted using IBM SPSS Statistics v.23, IBM SPSS Amos v.23, and Stata 13.

3.2.1 Descriptive Analysis

3.2.1.1 Sample Description: Respondent Profile

This section presents a description of the sample. Univariate analysis is performed to show the variables related to the respondent's profile, including gender, age, nationality, current residence, academic degree, professional status, type of sector of activity, type of participation in community forums, number of contributions, level of use, and number of years participating in open-source communities.

The following table shows the gender distribution of the respondents.

Table 24. Respondent profile: Gender

Gender	N	%
Male	359	52.6
Female	324	47.4
Total	**683**	**100.0**

Source: Own elaboration

The distribution of respondents by gender is notably balanced, with 52.6% identifying as male and 47.4% identifying as female. This gender balance within the respondent pool signifies a relatively equal representation of both male and female participants in the study.

The following table shows the age distribution of the respondents, with classes of 10 years each.

Table 25. Respondent profile: Age

Age	N	%
<= 25 years	52	7.6
26 - 35 years	131	19.2
36 - 45 years	123	18.0
46 - 55 years	170	24.9
56 - 65 years	143	20.9
> 65 years	64	9.4
Total	**683**	**100.0**

Source: Own elaboration

The analysis of the age distribution among the respondents reveals a diverse user base across all age groups, underscoring the inclusive nature of these communities. Notably, individuals in the age brackets of 46-55 years old (comprising 24.9% of respondents) and 56-65 years old (constituting 20.4%) emerge as the two most prominent segments within the community's user demographics.

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Furthermore, a substantial number of participants fall within the age ranges of 26-35 years old (19.2%) and 36-45 years old (18%), illustrating a robust presence of middle-aged users who actively engage with these communities.

In the extremities of the age spectrum, there is a noteworthy 9.4% representation of respondents aged 65 and older, demonstrating that these platforms are not limited to younger generations. In addition, 7.6% of respondents are 25 years old or younger, confirming that the communities attract a significant number of younger users, fostering a multigenerational and diverse user base.

The following table shows the nationality of the respondents.

Table 26. Respondent Profile: Nationality

Nationality	N	%	Nationality	N	%
Argentina	28	4.1	Netherland	26	3.8
Austria	29	4.2	Norway	22	3.2
Belarus	27	4	Paraguay	24	3.5
Belgium	22	3.2	Peru	22	3.2
Brazil	31	4.5	Poland	31	4.5
Canada	27	4	Portugal	28	4.1
Chile	29	4.2	Russia	34	5
Ecuador	23	3.4	Spain	32	4.8
France	19	2.8	Sweden	29	4.2
Germany	27	4	Switzerland	26	3.8
Italy	28	4.1	UK	29	4.2
Mexico	26	3.8	Uruguay	19	2.8
Morocco	18	2.6	USA	27	4
Subtotal	**334**	**48.9**	**Subtotal**	**349**	**51.1**

Total	**683**	**100%**

Source: Own elaboration

The survey drew participation from an impressively diverse pool of respondents, hailing from no less than 26 distinct nationalities. This global representation highlights the international reach of the study and the communities under investigation. Notably, certain nationalities exhibited a remarkable propensity for collaboration.

Among the most engaged and collaborative respondents were individuals from Russia (comprising 5% of the survey population), Spain (4.8%), Poland (4.5%), Austria (4.2%), Sweden (4.2%), the United Kingdom (4.2%), Portugal (4.1%), Italy (4.1%), Belarus (4%), Germany (4%), Switzerland (3.8%), and the Netherlands (3.8%). These countries boasted higher percentages of respondents actively participating in the surveyed communities.

Conversely, a smaller proportion of respondents from Norway (3.2%), Belgium (3.2%), and France (2.8%) were identified as the less collaborative segment of the survey population.

Turning attention to the Americas, a similar pattern of collaboration is evident. Respondents from Brazil (4.5%), Chile (4.1%), Argentina (4.1%), Canada (4%), the United States (4%), and Mexico (3.8%) demonstrate a strong inclination toward active involvement in the surveyed communities. On the other hand, the data reveals that respondents from Paraguay (3.5%), Ecuador (3.4%), Peru (3.2%), and Uruguay (2.8%) exhibit comparatively lower levels of collaboration.

It's worth noting that a portion of respondents from Morocco (2.6%) may have indicated a European or American country as their place of origin during registration. This could be due to various factors, such as their current residence or in some cases, a strategic approach to

navigate certain moderation rules. Such discrepancies in nationality reporting are not uncommon, especially when certain discussion topics pertain to specific regions.

The following table shows the amount and percentage of respondents are emigrants.

Table 27.Respondent Profile: Migrant

Migrant	N	%
No	476	69.7
Yes	207	30.3
Total	**683**	**100.0**

Source: Own elaboration

The survey results unveiled an interesting demographic aspect among the respondents, with 30.3% of them identifying as immigrants, while the majority, constituting 69.7%, were classified as non-immigrants. This demographic division adds depth to understand of the survey population, shedding light on the diversity and background of the participants.

The following table shows the respondents' countries of residence.

Table 28. Respondent Profile: Country of Residence

Residence	N	%	Residence	N	%
Argentina	31	4.5	Netherland	19	2.8
Austria	32	4.8	Norway	20	2.9
Belarus	10	1.5	Paraguay	19	2.8
Belgium	29	4.2	Peru	20	2.9
Brazil	57	8.4	Poland	22	3.2
Canada	46	6.7	Portugal	19	2.8
Chile	43	6.3	Russia	25	3.7
Ecuador	13	1.9	Spain	24	3.5
France	46	6.7	Sweden	18	2.6
Germany	23	3.4	Switzerland	29	4.2
Italy	20	2.9	UK	27	4
Mexico	21	3.1	Uruguay	29	4.2
Morocco	15	2.2	USA	26	3.8
Subtotal	**386**	**56.6**	**Subtotal**	**297**	**43.4**

Total	**683**	**100%**

Source: Own elaboration

The survey cast a wide net, attracting respondents from an impressive array of 26 different countries. This global representation not only reflects the study's international reach but also sets the stage for a comprehensive analysis of collaborative behaviors across diverse regions. It is worth noting that the degree of collaboration among respondents demonstrated intriguing variations, offering insights into the community dynamics.

Notably, a number of nations stood out for their particularly collaborative respondents. France led the way with a robust 6.7% representation, followed closely by Austria (4.8%), Belgium (4.2%), Switzerland (4.2%), the United Kingdom (4%), Russia (3.7%), Spain (3.5%), Germany (3.4%), Poland (3.2%), and the Netherlands (2.8%). These countries boasted a higher percentage of respondents actively engaging and contributing to the surveyed communities.

In contrast, certain regions showed a comparatively lower degree of collaboration, with Norway (2.9%), Italy (2.9%), Portugal (2.8%), Sweden (2.6%), Belarus (1.5%), and Morocco (2.2%) emerging as the less collaborative segments.

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Shifting our focus to the Americas, the results revealed a similar pattern. Respondents from Brazil demonstrated a strong propensity for collaboration, with a significant 8.4% participation rate, closely followed by Canada (6.7%), Chile (6.3%), Argentina (4.5%), Uruguay (4.2%), and the United States (3.8%). Conversely, Mexico (3.1%), Peru (2.9%), Paraguay (2.8%), and Ecuador (1.9%) displayed a somewhat lower degree of collaboration among respondents.

Morocco's 2.2% representation raised unique considerations. It is plausible that some respondents from Morocco indicated a different country of residence during registration, potentially because they are indeed residing in another country, or this choice might have been influenced by a desire to navigate specific moderation rules. This is a familiar scenario, particularly when discussions revolve around topics specific to certain regions. Further exploration of these distinctive participation patterns could provide valuable insights into the survey's regional dynamics.

The following table presents the academic level of the respondents.

Table 29. Respondent Profile: Level of Graduation

Level of Graduation	N	%
Doctoral	203	29.8
Master	194	28.4
Graduate	212	31.0
High School	74	10.8
Total	**683**	**100.0**

Source: Own elaboration

The educational composition of the survey respondents offers intriguing insights into the academic background and qualifications of the participants. The majority, a substantial 89.2% of the respondents, hold a university degree, underscoring the prevalence of higher education within this group. Additionally, 10.8% of respondents possess a high school diploma as their highest educational attainment.

Delving deeper into the realm of higher education, a closer examination of university-educated respondents reveals a diversified landscape. Graduates stand as the most prominently represented group at 31%, with a significant proportion of the survey population holding bachelor's degrees. Close behind, doctorate holders constitute a substantial 29.8% of the respondents, reflecting a significant presence of individuals with advanced research qualifications. Meanwhile, master's degree holders contribute significantly to the survey cohort, making up 28.4% of the educational landscape.

This diverse educational composition presents a fascinating backdrop for analyzing and interpreting the survey results, as it suggests that the respondents bring a wide range of academic perspectives and expertise to the discussion.

The following table presents the employment status of the respondents.

Table 30. Respondent Profile: Work Status

Work Status	N	%
Employee	572	83.8
Unemployed	13	1.9
Student	33	4.8
Retired	65	9.5
Total	**683**	**100.0**

Source: Own elaboration

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The work status of the survey respondents provides a window into the diverse backgrounds and life stages of the participants, painting a multifaceted picture of the study's demographic composition. Notably, the largest segment, comprising 83.8% of the respondents, is currently employed, highlighting the significance of the working population in the study's sample.

Retired individuals constitute another substantial portion of the respondent base, accounting for 9.5% of the total. Their presence underscores the participation of experienced individuals who have transitioned into retirement and continue to engage with the subject matter.

Furthermore, the survey also encompasses a smaller yet noteworthy cohort of student respondents, representing 4.8% of the total. This segment signifies the involvement of the younger generation, still in the pursuit of their academic endeavors, who bring fresh perspectives to the discussion.

A smaller fraction of respondents, at 1.9%, identify as unemployed. Their inclusion in the survey population highlights the engagement of individuals who may be in transitional phases or seeking new opportunities.

The following table shows the activity sector in which respondents work.

Table 31. Respondent Profile: Work Type

Work Type	N	%
Private Enterprise	361	52.9
Public Administration	108	15.8
Freelancer	116	17.0
Student	33	4.8
Retired	65	9.5
Total	**683**	**100.0**

Source: Own elaboration

The work type of the survey respondents offers valuable insights into the broader professional landscape from which they hail, shedding light on the diverse sectors and work arrangements represented in the study. A significant proportion, constituting 52.9% of respondents, are employed within the private sector, emphasizing the prevalence of private enterprise within the sample. This data reflects the broad engagement of individuals within private firms, each contributing a unique perspective to the research.

Freelancers, comprising 17% of respondents, form a substantial and distinct segment within the study population. These individuals, often characterized by their entrepreneurial spirit and self-employment, offer a distinctive viewpoint that enriches the survey's analysis.

Notably, the public administration sector is another prominent sphere of employment among the respondents, with 15.8% participating in the study. This segment plays a crucial role in shaping the community and societal dynamics and contributes a unique perspective grounded in public service.

Retired individuals (9.5%) constitute a significant segment within the respondent pool, surpassing the participation rate of student respondents (4.8%). Their presence reflects the continued engagement of experienced individuals who have transitioned into retirement, bringing valuable insights and wisdom to the discourse. Conversely, the representation of students showcases the involvement of the younger generation in the survey, each with the potential to contribute fresh viewpoints and innovative ideas. The following table shows the number of contributions that the respondents made.

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Table 32. Respondent Profile: Number of Contributions

Number of Contributions	N	%
Passive User	18	2.6
1 – 50	114	16.7
51 – 100	241	35.3
101 – 150	240	35.2
>150	70	10.2
Total	**683**	**100.0**

Source: Own elaboration

The extent of respondents' contributions to the study's subject matter offers a nuanced view of their engagement and involvement within the research domain. Notably, a considerable proportion, totaling 35.3% of the respondents, reported making between 51 and 100 contributions. This group, defined by its substantial interaction, has actively shaped the conversation by offering a significant volume of insights and feedback.

Close behind, respondents who reported between 101 and 150 contributions constituted a remarkably similar segment, representing 35.2% of the total. Their involvement mirrors that of the previous group, highlighting the robust engagement and dedication to the study's subject matter.

Conversely, a smaller yet noteworthy proportion, comprising 16.7% of respondents, made between 1 and 50 contributions. This segment signifies active participation but on a somewhat more moderate scale, indicating that the study attracted varying degrees of engagement.

Additionally, a segment of the respondents, accounting for 10.2%, contributed more than 150 times. These individuals are characterized by their extensive involvement, actively influencing and shaping the discourse with their wealth of contributions.

Furthermore, a smaller subset, comprising 2.6% of respondents, reported making no contributions. The inclusion of this group underscores the diversity of involvement, capturing the presence of individuals who may have chosen to remain observers, or for various reasons, did not actively participate in the study.

These multifaceted patterns of contribution levels among the respondents provide critical insights into the depth and breadth of their engagement, illustrating the varying degrees to which participants have actively shaped the discourse surrounding the study's topic.

The following table shows the distribution of respondents by type of participation.

Table 33. Respondent Profile: Participation

Participation	N	%
User / Customer without suggestion	10	1.5
User / Customer with suggestion	596	87.3
The platform development engineer	69	10.1
I'm not User / Customer, but I have curiosity	3	0.4
I'm not User / Customer, but this platform is in my firm	5	0.7
Total	**683**	**100.0**

Source: Own elaboration

The composition of the respondent pool unveils a rich tapestry of backgrounds and roles, shedding light on their diverse engagement with the Linux distribution and the study's subject matter. A substantial majority, accounting for 87.3% of respondents, are active users who not only utilize the Linux distribution but also contribute ideas and suggestions. These individuals play a pivotal role in shaping the community and contributing to its development.

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Engineers, who are directly involved in the development of the Linux distribution, represent a significant segment, making up 10.1% of the respondents. Their involvement adds a layer of expertise to the study, as they contribute insights and perspectives rooted in their hands-on contributions to the Linux ecosystem.

A smaller yet distinct proportion, constituting 1.5% of respondents, reported not making suggestions. This segment's presence underscores the diversity of roles within the Linux community, highlighting that not all users necessarily engage in active discussions or offer suggestions.

Further diversifying the respondent base, a subset of 0.4% reported not being users of Linux but expressed curiosity about the platform. Their inclusion illustrates the study's ability to attract individuals interested in exploring the Linux environment.

Another smaller segment, comprising 0.7% of respondents, is not users but have the platform installed at their workplace. This group represents individuals who encounter Linux in a professional context, offering a unique perspective influenced by their work environment.

The following table shows the distribution of the respondents by level of use.

Table 34. Respondent Profile: Level of Use

Level of Use	N	%
Basic	126	18.4
Intermediate	247	36.3
Advanced	240	35.1
Specialist	70	10.2
Total	**683**	**100.0**

Source: Own elaboration

The self-assessment of respondents regarding their proficiency as users of the subject matter reveals a spectrum of skill levels and expertise, enhancing our understanding of their engagement and experiences. A substantial portion, representing 36.3% of respondents, places themselves in the category of intermediate users. This group, characterized by a solid foundation of knowledge and practical experience, forms the core of the user base.

Closely aligned with intermediate users, 35.1% categorize themselves as advanced users, displaying higher proficiency and deep engagement in the subject, contributing to its evolution and fostering advanced usage and understanding.

At the lower end, 18.4% identify as basic users, including those new to the subject or opting for a fundamental level of interaction. Conversely, 10.2% of respondents are expert users, leading the user base with extensive experience and expertise, significantly influencing and advancing the subject matter.

The following table shows the number of years that the respondents have been collaborating with the development platforms.

Table 35. Respondent Profile: Years of Collaboration

Years of Collaboration	N	%
<3 years	189	27.7
3 - 5 years	184	26.9
6 - 8 years	146	21.4
9 - 11 years	94	13.8
12 - 14 years	43	6.2
>= 15 years	27	4.0
Total	**683**	**100.0**

Source: Own elaboration

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The distribution of respondents' Linux experience provides valuable insights into the range of familiarity and expertise among the survey participants, offering a comprehensive view of their journey with the platform. A substantial portion, comprising 27.7% of respondents, falls within the category of relatively newcomers with less than 3 years of experience. These individuals represent a cohort of users who are likely in the early stages of their Linux journey, shaping the community with fresh perspectives and insights.

Close examination reveals that a significant 26.9% of respondents report possessing 3 to 5 years of experience. This indicates a substantial group of users who have surpassed the initial learning curve, attaining a heightened level of proficiency. This intermediate category contributes to the richness of experiences and engagement within the community.

Another noteworthy segment, constituting 21.4% of respondents, reports 6 to 8 years of Linux experience. This group represents individuals with a solid foundation of familiarity with the platform, likely contributing significantly to the community's growth and development.

Looking further along the spectrum, 13.4% of respondents have acquired 9 to 11 years of experience, underlining the presence of seasoned users who bring a wealth of knowledge and expertise to the study. Additionally, 6.2% of respondents report 12 to 14 years of experience, while 4% of the respondent base boasts 15 years or more of experience with Linux. These individuals represent the stalwarts of the Linux community, offering invaluable insights, guidance, and contributions to the platform's evolution.

3.2.1.2 Theoretical Constructs: Univariates Analysis

In this section, theoretical constructs are described performing univariate analysis. The following table presents the result of the univariate analysis of the platform identification construct.

Table 36. Univariates Analysis: Platform Identification

ITEM	N	Min.	Max.	Mean	Std. Dev.
A.1 - I strongly identify with this platform	683	1	7	5.05	1.595
A.2 - I feel good to be user of this platform	683	1	7	5.04	1.600
A.3 - I like to tell that I am user of this platform	683	1	7	5.10	1.598
A.4 - This platform fits well to me	683	1	7	5.11	1.597
A.5 - I feel attached to this platform	683	1	7	5.12	1.578

Source: Own elaboration

The examination of survey items unveils a captivating exploration of the sentiments and perceptions held by respondents regarding the subject matter, providing invaluable insights into their interaction with the platform. It is worth highlighting that every item exhibits mean values surpassing the study's average of 4.00, underscoring a prevailing optimistic perspective and a robust sense of engagement among the surveyed individuals.

Moreover, this optimistic trend across the surveyed items not only suggests a positive overall reception but also implies a notable degree of satisfaction and enthusiasm within the respondent pool. The consistently elevated mean values across various items point towards a cohesive and affirmative connection between the users and the platform.

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At the forefront of this positive sentiment is item A.5 - "I feel attached to this platform," which boasts the highest mean of 5.12. This item resonates deeply with the user base, emphasizing a strong emotional attachment and a sense of connection to the platform.

Following closely are items A.4 - "This platform fits well to me" has a mean 5.11, and A.3 - "I like to tell that I am a user of this platform" with the highest mean of 5.10. These items reflect a strong sense of compatibility and pride among users, suggesting that the platform aligns well with their needs and preferences, and they take pride in their association with it.

On the other end of the spectrum, the lowest means are observed for items A.1 - "I strongly identify with this platform" with the highest mean of 5.05, and A.2 - "I feel good to be a user of this platform" with the highest mean of 5.04. While these items still exhibit high mean values, they suggest a slightly less intense level of identification and positive emotion among users in comparison to the other items.

The following table presents the result of the univariate analysis of the sense of community construct.

Table 37. Univariates Analysis: Sense of Community

ITEM	N	Min.	Max.	Mean	Std. Dev.
B.1 - I consider myself as a member of this Community	683	1	7	4.65	1.512
B.2 - I think this Community platform is a good place to spend my spare time	683	1	7	4.66	1.513
B.3 - I feel closely connected to other participants of this Community	683	1	7	4.73	1.518
B.4 - I feel a sense of kinship with other Community members	683	1	7	4.68	1.535
B.5 - I have a strong desire to further interact with participants of this Community	683	1	7	4.66	1.496

Source: Own elaboration

The assessment of survey items reveals a consistently positive outlook among respondents, with all items boasting mean values exceeding the study's average of 4.00. These means, while displaying slight variations, are notably close, reflecting a generally high level of satisfaction and engagement within the community.

Within the realm of community engagement assessment, a noteworthy observation emerges when analyzing Item B.3 - "I feel closely connected to other participants of this community," which stands out with the highest mean score of 4.67. This particular item sheds light on more than just a sense of connection; it underscores a robust camaraderie and interpersonal bond among respondents within the community. The high mean score suggests not only a recognition of shared interests but also a profound emotional connection, highlighting the pivotal role of the community in fostering these meaningful relationships. This insight points towards a community culture that goes beyond mere participation, cultivating a space where individuals genuinely feel a part of something larger and interconnected.

Following closely is Item B.4 - "I feel a sense of kinship with other community members," which achieves a mean score of 4.66. This item delves into the depth of relationships formed within the community, emphasizing not only shared interests but also a shared identity. The consistently high mean score suggests that community members

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experience a profound sense of belonging, contributing significantly to the overall cohesiveness and solidarity within the community. This shared identity becomes a driving force, influencing participants to see themselves not merely as individuals interacting on a platform but as integral members of a collective entity.

Moreover, Items B.2 - "I think this community platform is a good place to spend my spare time," and B.5 - "I have a strong desire to further interact with participants of this community," share an equal mean value of 4.66. These items collectively highlight the community's role as not just a space for engagement but as an attractive and fulfilling environment. Participants not only find the community platform appealing but also express a strong desire for continued interaction, indicating that the community serves as more than a pastime—it becomes a meaningful part of their ongoing social and intellectual pursuits.

On the lower end of the spectrum, Item B.1 - "I consider myself as a member of this community," holds the lowest mean value at 4.65. While this score still indicates a positive perception, it provides valuable nuances into participants' varying levels of identification with the community. This suggests that, while the majority feels closely connected and a sense of kinship, some participants may perceive their community affiliation slightly differently. These insights contribute to a comprehensive understanding of the diverse ways individuals engage and relate within the community context.

The following table presents the result of the univariate analysis of the innovativeness construct.

Table 38. Univariates Analysis: Innovativeness

ITEM	N	Min.	Max.	Mean	Std. Dev.
C.1 - I often risks doing things differently	683	1	7	4.60	1.484
C.2 - I have original ideas	683	1	7	4.54	1.433
C.3 - I cope with several ideas at the same time	683	1	7	4.58	1.494
C.4 - I proliferate ideas	683	1	7	4.57	1.498
C.5 - I have fresh perspectives on old problems	683	1	7	4.54	1.487
C.6 - I am stimulating	683	1	7	4.54	1.513
C.7 - I will always think of something when stuck	683	1	7	4.62	1.480
C.8 - I can stand out in disagreement against a group	683	1	7	4.52	1.475
C.9 - I would sooner create than improve	683	1	7	4.60	1.501
C.10 - I like to vary set routines at a moment’s notice	683	1	7	4.55	1.497
C.11 - I need the stimulation of frequent change	683	1	7	4.58	1.427

Source: Own elaboration

In this construct, composed of eleven items, all exhibit a mean higher than the study's average value, namely, 4.00. The item C.7 - "Always comes up with solutions when facing obstacles" with the mean of 4.62 is the one that demonstrates the strongest affinity with the ability to consistently conceive creative alternatives when confronted with challenges, highlighting the respondent's capability to overcome obstacles through innovative thinking.

Secondly, items C.1 - "Often take different approaches in activities" with the mean 4.60, and C.9 - "Prefer creating something new to improving something existing" with the mean

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4.60 showcase a notable willingness to take risks and explore unconventional approaches. They emphasize a preference for innovation and creativity over incremental improvements.

In the middle of the scale are items such as C.3 - "Handle multiple ideas simultaneously" with the mean 4.58, C.4 - "Generate a profusion of ideas" with the mean 4.57, C.10 - "Enjoy varying established routines on the spot," and C.11 - "Need the stimulation of frequent changes" both with a mean of 4.58. These items reflect a moderate level of agreement among respondents, indicating their ability to manage multiple ideas simultaneously and their willingness for change and adaptability.

On the other hand, items with slightly lower means, though still above the study's average, include C.8 - "Can stand out in disagreements with a group" with the mean 4.52, C.2 - "Have original ideas" with the mean 4.54, C.5 - "Provide fresh perspectives on old problems" with the mean 4.54, and C.6 - "Are stimulating" with the mean 4.54. These items suggest a slightly lower degree of alignment among respondents regarding the ability to stand out in disagreements, generate original ideas, or offer innovative perspectives to existing challenges.

The following table presents the result of the univariate analysis of the competence construct.

Table 39. Univariates Analysis: Competence

ITEM	N	Min.	Max.	Mean	Std. Dev.
D.1 - Participation in the development of the platform made me feel smart	683	1	7	3.92	2.041
D.2 - Participation in the development of the platform made me feel competent	683	1	7	3.87	2.032
D.3 - Participation in the development of the platform made me feel talented	683	1	7	3.92	1.989
D.4 - Participation in the development of the platform made me feel intelligent	683	1	7	3.85	1.945

Source: Own elaboration

This construct comprises four items, all of which exhibit mean values slightly below the study's average of 4.00, reflecting a nuanced perspective among respondents concerning the impact of their participation in the development of the platform.

The examination of participant perceptions in platform development reveals intriguing insights, particularly regarding the different facets of self-perception associated with participation.

Evidently, the item that stands out with the highest mean is D.1 - "Participation in the development of the platform made me feel smart," registering an impressive mean of 3.92. This finding underscores a noteworthy aspect of participants' experiences — their belief that engaging in platform development contributes significantly to their sense of intelligence and cognitive prowess. It implies that participation is not merely a practical involvement but an activity that positively influences participants' self-esteem and intellectual confidence. By feeling smart through participation, respondents may experience a unique form of intellectual empowerment that enhances their overall sense of self.

Closely trailing is item D.3 - "Participation in the development of the platform made me feel talented," which also boasts a mean score of 3.92. This item brings attention to

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participants attributing a sense of talent and exceptional skill to their involvement in platform development. This suggests that participation goes beyond a sense of intelligence, extending into the realm of creative and practical competence. The mean score indicates that participants perceive their engagement as a source of not only intellectual empowerment but also a recognition of their unique abilities and talents, adding a layer of richness to their overall experience.

On the lower end of the scale, items D.2 - "Participation in the development made me feel competent," with a mean of 3.87, and D.4 - "Participation in the development of the platform made me feel intelligent," with a mean of 3.85, reveal that participants, on average, still associate their involvement with feelings of competence and intelligence. While these mean scores are slightly lower compared to other items in this construct, they underscore that, as a whole, participants perceive their engagement in platform development as contributing positively to their self-perception, albeit to a slightly lesser degree in terms of competence and general intelligence. These nuanced variations in perception provide valuable insights into the multifaceted impact of participation in the development process. The following table presents the result of the univariate analysis of the autonomy construct.

Table 40. Univariates Analysis: Autonomy

ITEM	N	Min.	Max.	Mean	Std. Dev.
E.1 - I had a great deal of freedom to make choices when participating in the development of the platform	683	1	7	4.07	1.661
E.2 - I was able to express myself when participating in the development of the platform	683	1	7	4.04	1.650
E.3 - I felt controlled when participating in the development of the platform (R)	683	1	7	4.04	1.657
E.4 - I felt pressured when participating in the development of the platform (R)	683	1	7	4.03	1.679

Source: Own elaboration

This construct encompasses four distinct items, each exhibiting mean values slightly surpassing the study's average of 4.00. The proximity of these mean values indicates an overarching positive perspective among respondents regarding their engagement in the platform's development.

Standing out with the highest mean score is E.1 - "I had a great deal of freedom to make choices when participating in the development of the platform," boasting a mean of 4.07. This particular item sheds light on the perceived level of autonomy and decision-making freedom granted to respondents throughout their involvement in the platform's development. The elevated mean score implies that participants felt they possessed significant latitude in their choices, cultivating a sense of empowerment and self-direction within the developmental process.

In examining the participant responses, it's noteworthy that both E.2 - "I was able to express myself when participating in the development of the platform," and the reversed E.3 - "I felt controlled when participating in the development of the platform," yielded identical mean scores of 4.04. This convergence underscores a pivotal aspect of the participants' experience during the platform's development, emphasizing the equilibrium between expressive freedom and the absence of perceived control.

These shared mean scores reveal that participants not only actively seized opportunities to articulate their ideas and perspectives but also reported a balanced perception of independence within the developmental process. This nuanced dynamic fosters an environment where individual expression is valued and encouraged, yet simultaneously, participants do not feel unduly restrained or subjected to unwarranted control. The identical mean scores suggest a consensus among participants regarding the coexistence of individual autonomy and a lack of overbearing control, thus contributing to the overall collaborative and constructive atmosphere during the developmental phase.

Concluding this exploration of participant experiences, E.4 - "I felt pressured when participating in the development of the platform (reversed)," with a mean of 4.03, reinforces the overarching positive trend within the construct. The reversed nature implies a lack of perceived pressure, aligning seamlessly with participants' overall positive experiences during the platform's developmental phase. This collective sentiment emphasizes the importance of fostering an environment marked by autonomy, expressive freedom, and minimal pressure in co-creative endeavors, ultimately contributing to a more enriching and collaborative developmental experience for all participants involved.

The following table presents the result of the univariate analysis of the task enjoyment construct.

Table 41. Univariates Analysis: Task Enjoyment

ITEM	N	Min.	Max.	Mean	Std. Dev.
F.1 - I enjoyed participating in the development of the platform	683	1	7	4.71	1.628
F.2 - I had a good time participating in the development of the platform	683	1	7	4.68	1.640
F.3 - Participation in the development of the platform was a lot of fun	683	1	7	4.69	1.662
F.4 - Participation in the development of the platform was very satisfying	683	1	7	4.70	1.657
F.5 - I felt annoyed when participating in the development of the platform (R)	683	1	7	4.68	1.697
F.6 - I felt frustrated when participating in the development of the platform (R)	683	1	7	4.70	1.668

Source: Own elaboration

This construct encompasses six items, each of which exhibits a mean higher than the study's average value of 4.00, aligning with the pattern observed in the previous constructs. These items collectively capture the respondents' experiences and emotional responses during their participation in the development of the platform.

The item with the highest mean is F.1 - "I enjoyed participating in the development of the platform" with a mean 4.71, emphasizing the overwhelmingly positive aspect of enjoyment and satisfaction derived from participation. This item underscores that respondents found their participation to be an enjoyable and fulfilling experience.

Closely following are two items, F.4 - "Participation in the development of the platform was very satisfying" and F.6 - "I felt frustrated when participating in the development of the platform (reversed)," both with a mean of 4.70. While the first item reinforces the notion of high satisfaction, the reversed item F.6 suggests that respondents, on average, did not

experience significant frustration during their participation, aligning with the overall positive trend.

Turning attention to Item F.3 - "Participation in the development of the platform was a lot of fun," the mean score of 4.69 adds another layer to the overarching positive sentiment within this construct. This item unequivocally highlights the enjoyable and engaging nature of participants' involvement, placing a strong emphasis on the element of fun infused into the developmental process. The mean score reflects a collective perception that the participatory experience was not only fulfilling but also infused with a genuine sense of enjoyment, contributing to a positive and vibrant atmosphere during the platform's development.

Similarly, both Items F.2 - "I had a good time participating in the development of the platform" and the reversed F.5 - "I felt annoyed when participating in the development of the platform," sharing a mean of 4.68, reaffirm the positive emotional dimension associated with participation. The shared mean suggests that participants not only had a good time engaging in the developmental process but also, notably, did not generally experience pronounced annoyance, as indicated by the reversed item. This dual perspective paints a picture of a participatory environment characterized not only by satisfaction and enjoyment but also by a lack of significant negative emotions, fostering a collectively positive and enriching experience for those involved.

The following table presents the result of the univariate analysis of the co-creation participation construct.

Table 42. Univariates Analysis: Co-Creation Participation

ITEM	N	Min.	Max.	Mean	Std. Dev.
G.1 - I spent a lot of time, sharing information about my needs and opinions with the staff during the service process.	683	1	7	4.70	1.668
G.2 - I put a lot of effort into expressing my personal needs to the staff during the service process	683	1	7	4.66	1.655
G.3 - I always provide suggestions to the staff for improving the service outcome	683	1	7	4.64	1.641
G.4 - I have a high level of participation in the service process	683	1	7	4.54	1.673
G.5 - I am very much involved in deciding how the services should be provided	683	1	7	4.70	1.710

Source: Own elaboration

This construct consists of five items, all of which exhibit a mean higher than the study's average value of 4.00, signaling a generally active and engaged participation in the service process. These items collectively shed light on the extent of the respondents' involvement in providing input and suggestions during the service delivery process.

The highest mean is shared by items G.1 and G.5, "I spent a lot of time-sharing information about my needs and opinions with the staff during the service process" and "I am very much involved in deciding how the services should be provided" both share a mean 4.70. These items underline the extensive involvement of respondents in communicating their needs, opinions, and active participation in shaping the service delivery. This indicates a strong commitment to being an active and influential part of the service process.

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Within this construct, Item G.2 - "I put a lot of effort into expressing my personal need to the staff during the service process" stands out with a noteworthy mean of 4.66. This elevated mean highlights the participants' commitment and dedication to articulating their individual needs effectively throughout the service process. It signifies a proactive engagement on the part of respondents, showcasing their determination to ensure that their unique requirements are clearly communicated to the staff, underscoring the importance they place on personalized and tailored service experiences.

Moving to the remaining items, both maintaining high means, albeit slightly lower than the ones, contributes additional insights into participants' behaviors and attitudes. Item G.3 - "I always provide suggestions to the staff for improving the service outcome" holds a commendable mean of 4.64, indicating a consistent pattern of participants actively contributing constructive feedback and suggestions to enhance the service outcome. This emphasizes a collaborative approach, where participants not only engage with the service but actively seek to contribute to its improvement, reflecting a sense of partnership in shaping the quality of the service.

Similarly, Item G.4 - "I have a high level of participation in the service process" boasts a mean of 4.54, still positioned above the study's average. While slightly lower than the other aspects, this mean suggests that respondents perceive their level of participation in the service process as robust, even if comparatively a bit lower than their engagement in expressing personal needs or providing suggestions. This nuanced observation hints at varying degrees of involvement within different facets of the service experience, adding depth to our understanding of participants' active engagement in shaping and influencing the service process.

The following table presents the result of the univariate analysis of the economic value construct.

Table 43. Univariates Analysis: Economic Value

ITEM	N	Min.	Max.	Mean	Std. Dev.
H.1 - My participation helps me receive higher quality services	683	1	7	5.23	1.499
H.2 - My participation helps me receive more customized services	683	1	7	5.26	1.497
H.3 - My participation helps me receive more professional services	683	1	7	5.23	1.482
H.4 - My participation helps me receive more control over the services quality	683	1	7	5.20	1.565
H.5 - My participation helps me receive less service failure	683	1	7	5.16	1.497

Source: Own elaboration

This construct consists of five items, and notably, all of these items exhibit means higher than the study's average value of 4.00, indicating the perceived positive impact of participation on service quality and outcomes. These items collectively provide insights into how respondents perceive the benefits of their involvement in receiving services.

Within this construct, the standout item is H.2 - "My participation helps me receive more customized services," boasting an impressive mean of 5.26. This elevated mean underscores the pivotal role that respondents attribute to their active participation in shaping and influencing the services they receive. It not only signifies a high level of perceived influence but also emphasizes that participants view their engagement as a significant contributor to the

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delivery of more personalized and tailored services. This insight illuminates the participants' belief in the transformative impact of their involvement on the customization of the services they experience.

Closely trailing are two items, H.1 - "My participation helps me receive higher quality services," and H.3 - "My participation helps me receive more professional services," both securing a mean of 5.23. These items collectively emphasize the positive influence that participant engagement exerts on service quality and professionalism. The high mean scores suggest that participants strongly believe that their active involvement enhances not only the overall quality of the services they receive but also the professionalism exhibited by the service providers. This speaks to the participants' perception of their role in elevating the standard and expertise associated with the services they engage with.

The remaining two items in this construct, while maintaining high means, are slightly lower than the previously mentioned ones. Item H.4 - "My participation helps me receive more control over the services quality," with a mean of 5.20, highlights the sense of control that participants associate with their engagement in the service process. This implies that participants believe their active participation affords them a greater degree of influence over the quality of the services they receive. Item H.5 - "My participation helps me receive fewer service failures," with a mean of 5.16, suggests that respondents link their involvement to a reduced likelihood of service failures, emphasizing the perceived efficacy of participation in mitigating potential issues.The following table presents the result of the univariate analysis of the relational value construct.

Table 44. Univariates Analysis: Relational Value

ITEM	N	Min.	Max.	Mean	Std. Dev.
I.1 - My participation helps me build a better relationship with the service provider.	683	1	7	3.63	1.659
I.2 - My participation makes the service interaction more enjoyable.	683	1	7	3.67	1.643
I.3 - My participation helps me receive relational approval from the service provider.	683	1	7	3.63	1.689

Source: Own elaboration

This construct comprises three items, each of which exhibits a mean slightly lower than the study's average value of 4.00, suggesting a nuanced perspective regarding the interpersonal and relational aspects of participation in the service interaction.

The item with the highest mean in this construct is I.2 - "My participation makes the service interaction more enjoyable," with a mean of 3.67. This item indicates that respondents perceive their participation as contributing to a more enjoyable and positive service interaction, highlighting an improved experience resulting from their engagement.

Conversely, the two remaining items in this construct, I.1 - "My participation helps me build a better relationship with the service provider" and I.3 - "My participation helps me receive relational approval from the service provider," both share the same mean of 3.63, which is slightly lower than the study's average. These items suggest that respondents perceive their involvement as having a slightly lower impact on building stronger relationships and receiving relational approval from service providers compared to other aspects.

The following table presents the result of the univariate analysis of the satisfaction construct.

Table 45. Univariates Analysis: Satisfaction

ITEM	N	Min.	Max.	Mean	Std. Dev.
J.1 - I am satisfied with the services provided.	683	1	7	3.89	1.577
J.2 - This platform is a good option to do business with.	683	1	7	3.83	1.634
J.3 - The service of this platform meets my expectations.	683	1	7	3.89	1.586
J.4 - Overall, I am satisfied with the service provided by this platform.	683	1	7	3.98	1.436

Source: Own elaboration

This construct encompasses four items, and all of them exhibit mean values slightly lower than the study's average of 4.00, reflecting the respondents' satisfaction with the services provided by the platform.

The item with the highest mean in this construct is J.4 - "Overall, I am satisfied with the service provided by this platform," with a mean of 3.98. This item indicates that respondents, on the whole, express satisfaction with the platform's services, emphasizing their contentment with the overall service experience.

Following closely are two items, J.1 - "I am satisfied with the services provided," and J.3 - "The service of this platform meets my expectations," both with a mean of 3.89. These items emphasize the respondents' satisfaction with the services offered by the platform and the extent to which the service aligns with their expectations.

The item with the lowest mean in this construct is J.2 - "This platform is a good option to do business with," with a mean of 3.83. This item suggests that respondents are somewhat less convinced that the platform is a highly favorable option for conducting business, indicating a slightly lower level of satisfaction in this regard.

The following table presents the result of the univariate analysis of the word-of-mouth construct.

Table 46. Univariates Analysis: Word-of-Mouth

ITEM	N	Min.	Max.	Mean	Std. Dev.
K.1 - I say positive things about this platform to other people.	683	1	7	4.63	1.425
K.2 - I recommend this platform to someone who seeks my advice.	683	1	7	4.60	1.404
K.3 - I can recommend this platform without any concerns.	683	1	7	4.59	1.410

Source: Own elaboration

This construct comprises three items, each of which exhibits a mean higher than the study's average value of 4.00, indicating a strong inclination among respondents to actively promote and recommend the platform to others. These items collectively provide insights into the extent of respondents' advocacy and willingness to endorse the platform.

The item with the highest mean in this construct is K.1 - "I say positive things about this platform to other people," with a mean of 4.63. This item underscores that respondents express positive sentiments about the platform and actively engage in word-of-mouth promotion, highlighting their inclination to share their favorable experiences with others.

Closely following is K.2 - "I recommend this platform to someone who seeks my advice," with a mean of 4.60. This item emphasizes the respondents' readiness to provide

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recommendations to individuals seeking their guidance, signifying a willingness to advocate for the platform based on their own positive experiences.

The remaining item, K.3 - "I can recommend this platform without any concerns," has a mean of 4.59. This item suggests that respondents are confident in their ability to endorse the platform without reservations, indicating a high level of trust and conviction in the platform's value and quality.

The following table presents the result of the univariate analysis of the future participation construct.

Table 47. Univariates Analysis: Future Participation

ITEM	N	Min.	Max.	Mean	Std. Dev.
L.1 – I am interested in participating in other projects	683	1	7	4.41	1.890
L.2 – I am Interested to propose more ideas in the next events	683	1	7	4.40	1.924
L.3 – I am Interested in making new discoveries	683	1	7	4.45	1.886
L.4 – I am interested in customizing more the experience	683	1	7	4.43	1.857

Source: Own elaboration

This construct encompasses four items, each of which exhibits a mean higher than the study's average value of 4.00, signaling the respondents' interest in various aspects of engagement and innovation within the platform. These items collectively shed light on their enthusiasm for exploration, customization, and participation in different projects and events.

The item with the highest mean in this construct is L.3 - "I am interested in making new discoveries," with a mean of 4.45. This item underscores that respondents express a keen interest in exploring and making new discoveries within the platform, emphasizing their curiosity and motivation for novel experiences.

Closely following is L.4 - "I am interested in customizing the experience more," with a mean of 4.43. This item highlights the respondents' desire to personalize and tailor their platform experience, indicating a strong interest in customization and adaptability.

The remaining two items in this construct maintain high means, albeit slightly lower than the aforementioned items. Item L.1 - "I am interested in participating in other projects" has a mean of 4.41, emphasizing the respondents' enthusiasm for involvement in additional projects within the platform. Item L.2 - "I am interested in proposing more ideas in the events" has a mean of 4.40, indicating their interest in contributing and proposing innovative ideas during events.

3.2.2. Hypotheses Testing: CFA and SEM Analysis

In this section, the conceptual models are tested using the obtained sample of Linux communities. To do this, Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) are performed on the collected data. First, a graphical description of the general conceptual model and its sub-models is presented.

3.2.2.1 Conceptual Model: Summary

Table 48 shows the hypotheses that are graphically represented in the conceptual model shown in Figure 8**.**

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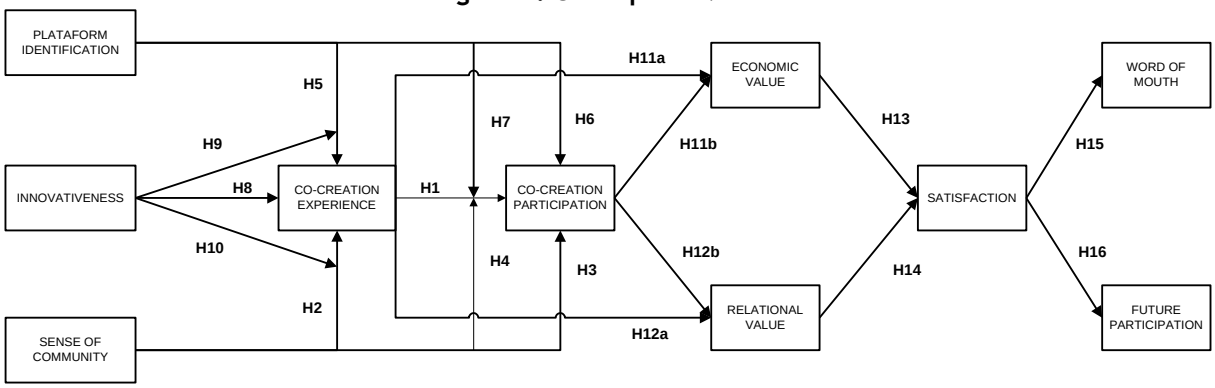
Figure 8. Conceptual Model



The overarching conceptual model is designed to provide a comprehensive understanding of the phenomenon of co-creation by dividing its intricate facets into two distinct parts.

In the first model, meticulous attention will be devoted to examining the antecedents and moderators of co-creation.

The second model will shift its focus towards delving into the myriad effects of co-creation. Here, the aim is to unravel the outcomes and impacts resulting from engaging in co-creation initiatives.

Table 48. Hypotheses Summary

HYPOTHESIS	PATH
H1	Co-Creation Experience is positively related to Co-Creation Participation
H2	Sense of Community is positively related to Co-Creation Experience
H3	Sense of Community is positively related to Co-Creation Participation
H4	Sense of Community moderates the relationship between Co-Creation Experience and Co-Creation Participation
H5	Platform Identification is positively related to Co-Creation Experience
H6	Platform Identification is positively related to Co-Creation Participation
H7	Platform Identification moderates the relationship between Co-Creation Experience and Co-Creation Participation
H8	Innovativeness is positively related to Co-Creation Experience
H9	Innovativeness moderates the relationship between Platform Identification and Co-Creation Experience
H10	Innovativeness moderates the relationship between Sense of Community and Co-Creation Experience
H11a	Co-Creation Experience is positively related to Economic Value
H11b	Co-Creation Participation is positively related to Economic Value
H12a	Co-Creation Experience is positively related to Relational Value
H12b	Co-Creation Participation is positively related to Relational Value
H13	Economic Value is positively related to Satisfaction
H14	Relational Value is positively related to Satisfaction
H15	Satisfaction have is positively related to Positive Word-of-Mouth
H16	Satisfaction have is positively related to Future Participation

Source: Own elaboration

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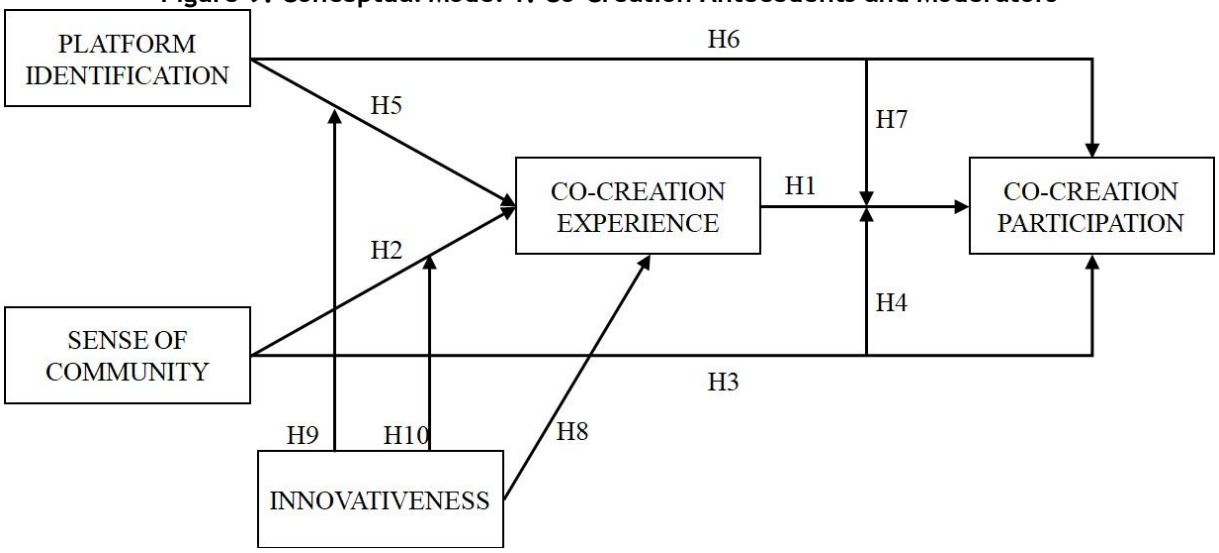
3.2.2.2 Co-Creation Antecedents and Moderators (Model 1): CFA and SEM

The next figure presents the conceptual model 1, summarizing research hypotheses to analyze the Antecedents and Moderators of Co-Creation.

Figure 9. Conceptual Model 1: Co-Creation Antecedents and Moderators



First, the existence of common method bias was tested using two different methods to determine the extent of variance.

The Harman one-factor test (Podsakoff & Organ, 1986) showed that a single general factor did not account for most variance in an Exploratory Factor Analysis (only 18.65%), suggesting that the presence of common method variance was unlikely to be significant.

The approach of Podsakoff et al. (2003) was also used, in which a new model with all the observed variables loading on one factor was re-estimated. The results of this model were unacceptable (Chi-square=9,562.245; df=740; RMSEA=0.132), which further suggests that common method bias was not a problem in this study.

The following table presents the results of the confirmatory factor analysis concerning model fit, validity, composite reliability, and Cronbach's alpha.

Table 49. Co-Creation Antecedents and Moderators (Model 1): CFA - summary measurement result, validity and reliability

	Standardized Loading
PLATFORM IDENTIFICATION (CR=0.922; AVE=0.703; CA=0.922)	
1. I strongly identify with this platform	0.818
2. I feel good to be user of this platform	0.843
3. I like to tell that I am user of this platform	0.831
4. This platform fits well to me	0.851
5. I feel attached to this platform	0.849
SENSE OF COMMUNITY (CR=0.885; AVE=0.606; CA=0.885)	
1. I consider myself as a member of this Community	0.773
2. I think this Community platform is a good place to spend my spare time	0.783
3. I feel closely connected to other participants of this Community	0.778
4. I feel a sense of kinship with other Community members	0.772
5. I have a strong desire to further interact with participants of this Community	0.785
INNOVATIVENESS (CR=0.936; AVE=0.579; CA=0.936)	
1. I often risks doing things differently	0.746
2. I have original ideas	0.757

	Standardized Loading
3. I cope with several ideas at the same time	0.763
4. I proliferate ideas	0.761
5. I have fresh perspectives on old problems	0.761
6. I am stimulating	0.779
7. I will always think of something when stuck	0.752
8. I can stand out in disagreement against a group	0.768
9. I would sooner create than improve	0.76
10. I like to vary set routines at a moment's notice	0.751
11. I need the stimulation of frequent change	0.724
CO-CREATION EXPERIENCE – ENJOYMENT (CR=0.909; AVE=0.626; CA=0.909)	
1. I enjoyed participating in the development of the platform	0.786
2. I had a good time participating in the development of the platform	0.787
3. Participation in the development of the platform was a lot of fun	0.784
4. Participation in the development of the platform was very satisfying	0.791
5. I felt annoyed when participating in the development of the platform (R)	0.809
6. I felt frustrated when participating in the development of the platform (R)	0.790
CO-CREATION EXPERIENCE – AUTONOMY (CR=0.927; AVE=0.761; CA=0.927)	
1. I had a great deal of freedom to make choices when participating in the development of the platform	0.863
2. I was able to express myself when participating in the development of the platform	0.859
3. I felt controlled when participating in the development of the platform (R)	0.883
4. I felt pressured when participating in the development of the platform (R)	0.883
CO-CREATION EXPERIENCE – COMPETENCE (CR=0.927; AVE=0.762; CA=0.927)	
1. Participation in the development of the platform made me feel smart	0.882
2. Participation in the development of the platform made me feel competent	0.881
3. Participation in the development of the platform made me feel talented	0.865
4. Participation in the development of the platform made me feel intelligent	0.863
CO-CREATION PARTICIPATION (CR=0.894; AVE=0.628; CA=0.894)	
1. I spent a lot of time, sharing information about my needs and opinions with the staff during the service process	0.777
2. I put a lot of effort into expressing my personal needs to the staff during the service process	0.790
3. I always provide suggestions to the staff for improving the service outcome	0.787
4. I have a high level of participation in the service process	0.812
5. I am very much involved in deciding how the services should be provided	0.796
MODEL FIT SUMMARY	
Chi-Square=755.789, df=719; CMIN/DF=1.051 CFI=0.998; IFI= 0.998; TLI=0.998; NFI=0.961 RMSEA=0.009	
Notation: CR: Composite Reliability; AVE: Average Variance Extracted; CA: Cronbach Alpha; (R) - Reverse sense.	

Source: Own elaboration

Content validity was established through a comprehensive literature review to ensure that the measures met the requirements for content validity. Discriminant validity, convergent validity, and scale reliability were assessed using confirmatory factor analysis, following the guidelines of Gerbing and Anderson (1988).

The results of the confirmatory factor analysis (see previous table) show that the overall chi-square for this model was 755.789 with 719 degrees of freedom, being the ratio of chi-square to degrees of freedom (CMIN/DF=1.051) less than the cutoff value of 3 (Bagozzi & Yi, 1988). Four measures of fit were examined: Comparative Fit Index (CFI=0.998), Incremental Fit Index (IFI=0.998), Tucker-Lewis Index (TLI=0.998), and Root Mean Square Error of Approximation (RMSEA=0.009). These values are within conventional cutoff values (Vandenberg & Lance, 2000), so the model was deemed acceptable.

To assess convergent validity, individual loadings were observed. The results show that all items load on their specified latent variables and that each loading is large and significant, thus indicating convergent validity (Anderson & Gerbing, 1988). Finally, regarding reliability, all constructs presented acceptable levels of composite reliability, considerably exceeding the level of 0.60 recommended by Bagozzi and Yi (1988):

- Co-Participation – CR=0.894;
- Platform Identification – CR=0.922;
- Sense of Community – CR=0.885;
- Innovativeness – CR=0.925;
- Co-Creation Experience
    - Competence - CR=0.927;
    - Autonomy – CR =0.927;
    - Enjoyment – CR=0.909;

To assess discriminant validity, construct intercorrelations were observed. The results show that they were significantly different from 1, and that the shared variance between any two constructs (the square of their intercorrelations) was less than the average variance explained in the items by the construct (Fornell & Larcker, 1981). The following table shows that the intercorrelations are greater than the square root of the Average Variance Extracted (AVE), indicating that discriminant validity is adequate for all latent variables.

The following table presents the results of the correlations between constructs and AVE.

Table 50. Co-Creation Antecedents and Moderators (Model 1): CFA - Correlations between constructs and AVE

CONSTRUCT	1	2	3	4	5	6	7	AVE
1. Innovativeness	**0.757**							**0.573**
2. Sense of Community	0.464	**0.778**						**0.606**
3. Platform Identification	0.664	0.598	**0.838**					**0.703**
4. Competence	0.619	0.666	0.582	**0.873**				**0.762**
5. Autonomy	0.278	0.376	0.424	0.470	**0.872**			**0.761**
6. Enjoyment	0.244	0.416	0.330	0.409	0.230	**0.791**		**0.626**
7. Co-Creation Participation	0.422	0.570	0.542	0.524	0.441	0.432	**0.792**	**0.628**
***Note:** Diagonal is the square root of the AVE*								

Source: Own elaboration

Based on the complexity of the model and the need to test the relationships between the different constructs at the same time, structural equation modeling (SEM) was used with the maximum likelihood method. The base model 1, without moderating effects, was estimated and the results are shown in the following table.

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Table 51. Co-Creation Antecedents and Moderators (Model 1): SEM - model fit summary and parameters estimates without moderating effects

HYP.	RELATIONSHIPS	STAND. PAR. ESTIMATE	P	TEST
H1	CO-CREATION EXPERIENCE → CO-CREATION PARTICIPATION	0.380	***	*Supported*
H2	SENSE OF COMMUNITY → CO-CREATION EXPERIENCE	0.611	***	*Supported*
H3	SENSE OF COMMUNITY → CO-CREATION PARTICIPATION	0.171	*	*Supported*
H5	PLATFORM IDENTIFICATION → CO-CREATION EXPERIENCE	0.257	***	*Supported*
H6	PLATFORM IDENTIFICATION → CO-CREATION PARTICIPATION	0.193	**	*Supported*
H8	INNOVATIVENESS → CO-CREATION EXPERIENCE	0.394	***	*Supported*
	2nd Order-parameters			
	CO-CREATION EXPERIENCE → COMPETENCE	0.828	***	
	CO-CREATION EXPERIENCE → AUTONOMY	0.459	***	
	CO-CREATION EXPERIENCE → ENJOYEMENT	0.419	***	
	MODEL FIT SUMMARY			
	Chi-Square=1,405.846; DF=731; MIN/DF=1.923 CFI=0.964; IFI=0.964; TLI=0.962; NFI=0.930 RMSEA=0.04			
	Note: * p<0.05; ** p<0.01; *** p<0.001; ns=not significant			

Source: Own elaboration

For the co-creation experience construct, second-order constructs were used, namely autonomy, competence, and task enjoyment, following the instructions of Dahl and Moreau (2007) and Füller et al. (2011).

The results from the estimation of structural equation modeling and parameter estimates show that the overall chi-square for this model was 1,405.846 with 731 degrees of freedom, being the ratio of chi-square to degrees of freedom (CMIN/DF=1.923) less than the cutoff value of 3 (Bagozzi & Yi, 1988). Four measures of fit were examined: Comparative Fit Index (CFI=0.964), Incremental Fit Index (IFI=0.964), Tucker-Lewis Index (TLI=0.962), and Root Mean Square Error of Approximation (RMSEA=0.04). These values are within conventional cutoff values (Vandenberg & Lance, 2000), so the model was deemed acceptable. Next, the test of hypotheses proposed in this model will be examined.

The first result for the model 1 without moderating effects is that platform identification is positively related to co-creation experience (H5: b=0.257, p<0.001) and co-creation participation (H6: b=0.193, p=0.001). Similarly, the study reveals that sense of community is positively related to co-creation experience (H2: b=0.611, p<0.001) and co-creation participation (H3: b=0.171, p=0.019). The study also reveals that Innovativeness is positively related to co-creation experience (H8, b=0.394, p<=0.001). Finally, the study reveals that co-creation experience is positively related to co-creation participation (H1: b=0.380, p<0.001).

The significance of the sense of community in shaping the co-creation experience emerges as a pivotal factor, wielding the most substantial influence among the parameters considered, when excluding second-order variables. This is exemplified by the robust influence exerted by the sense of community on the co-creation experience (B=0.611, p<0.001), signifying its paramount role in shaping individuals' engagement in collaborative

creation endeavors. However, it is noteworthy that the same sense of community exerts a comparatively lower influence on co-creation participation (B=0.171, p=0.019), indicating that while it significantly impacts the experience, its direct impact on the participation aspect is less pronounced.

In a parallel vein, the role of innovativeness surfaces as another noteworthy contributor, demonstrating a moderate influence on the co-creation experience (B=0.394, p<0.001). This suggests that individuals with a proclivity for innovation play a discernible role in shaping the overall co-creation experience. Simultaneously, the co-creation experience reciprocally wields a moderate influence on co-creation participation (B=0.380, p<0.001), underscoring the interconnected nature of these dimensions within the co-creation framework.

Platform identification, while displaying a less pronounced influence, still plays a role in both co-creation experience (B=0.257, p<0.001) and co-creation participation (B=0.193, p=0.001), albeit at a lower to moderate intensity level. This implies that individuals' identification with the platform influences their co-creation involvement to a certain extent, although not as dominantly as the sense of community or innovativeness.

The preeminence of the sense of community is reiterated in the overarching conclusion that it holds the greatest influence on the direct relationships within the co-creation paradigm. Turning attention to second-order influence, co-creation experience singularly exerts substantial influence on associated variables, with competence (B=0.828, p<0.001) taking the forefront, followed by autonomy (B=0.459, p<0.001), and enjoyment (B=0.419, p<0.001), although the distinctions among the latter are less pronounced at the intensity level. This dual-tiered analysis sheds light on the nuanced dynamics of factors shaping co-creation experiences and their subsequent impacts, providing valuable insights into the intricate interplay within collaborative creation contexts.

The model presented includes hypotheses that imply moderated mediation processes (Bauer et al., 2006; Edwards & Lambert, 2007). To simplify the model, the constructs were replaced by the average score of the indicators and grouped into a single measure. In addition, to avoid interpretation problems with some coefficients, given the measurement scales of some of the considered variables (which do not include the zero value), the average centralization of the variables involved in the terms of interaction was carried out. Finally, to assess the proposed moderated mediation process, the analysis was performed using Stata 13.0, following the steps described by Preacher et al. (2007).

Table 52. Co-Creation Antecedents and Moderators (Model 1): SEM - model fit summary and parameters estimates with moderating effects

HYP	Variables	Coef.	OIM S.D.	Z	P>|z|	95% Conf. Interval	
Co-Creation Experience							
	Age	0.056	0.091	0.61	0.540(ns)	-0.123	0.235
	Gender	0.047	0.064	0.73	0.468(ns)	-0.079	0.172
H2	Sense of Community → CC. Exp.	0.394	0.0341	11.55	***	0.3274	0.4613
H5	Platform Identification → CC. Exp.	0.284	0.03457	8.21	***	0.2162	0.3517
H8	Innovativeness → CC. Exp.	0.220	0.0395	5.57	***	0.1428	0.2978
H9	Plat. Ident. x Innov. → CC. Exp.	0.092	0.0248	3.71	***	0.0434	0.1407
H10	Sens. Comm. x Innov → CC. Exp.	0.057	0.0246	2.35	*	0.0095	0.1059

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HYP	Variables	Coef.	OIM S.D.	Z	P>|z|	95% Conf. Interval	
Co-Creation Participation							
	Age	0.286	0.118	2.43	*	0.055	0.516
	Gender	-0.121	0.082	-1.47	0.141(ns)	-0.281	0.040
	Innovativeness	0.052	0.054	0.96	0.337(ns)	-0.054	0.159
H1	CC. Exp. → CC. Part.	0.345	0.0490	7.03	***	0.2487	0.441
H3	Sens. Comm. → CC. Part.	0.273	0.0489	5.59	***	0.1772	0.369
H4	Sens. Comm. x CC. Exp. → CC. Part.	0.143	0.0513	2.79	**	0.424	0.244
H6	Plat. Ident. → CC. Part.	0.243	0.0489	5.59	***	0.1772	0.369
H7	Plat. Ident. x CC. Exp. → CC. Part.	-0.004	0.0373	-0.11	0.916 *(ns)*	-0.0771	0.069
	MODEL FIT SUMMARY						
	χ^2ms (2) = 4.897 (p > 0.05); χ^2bs (19) = 844.915 (p < 0.001); CFI 0.996; RMSEA = 0.046; SRMR = 0.004 Log likelihood: -10,113.972						
Notation: Plat. Ident – Platform Identification, CC. Exp. - Co-Creation Experience, Sens. Comm. – Sense of Community, Innov. – Innovativeness, CC. Part. – Co-Creation Participation							
Note: * p<0.05; ** p<0.01; *** p<0.001; ns=not significant							

Source: Own elaboration

The results from the estimation of SEM and parameter estimates show that the overall chi-square for this model was 4.897 with 2 degrees of freedom, being the ratio of chi-square to degrees of freedom (CMIN/DF=2.4485) was than the cutoff value of 3 (Bagozzi & Yi, 1988). Three measures of fit were examined: Comparative Fit Index (CFI=0.996), Root Mean Square Error of Approximation (RMSEA=0.046), and Standardized Root Mean Squared Residual (SRMSR=0.004). These values are within conventional cutoff values (Vandenberg & Lance, 2000), so the model was deemed acceptable. Next, the test of hypotheses proposed in this model will be examined.

The results reported in Table 52 reveals a network of positive relationships among key variables, providing valuable insights into the interconnected nature of elements within the co-creation paradigm. Platform identification emerges as a significant factor, positively influencing both the co-creation experience (H5: b=0.284, p<0.001) and co-creation participation (H6: b=0.243, p<0.001). This implies that individuals who identify strongly with the platform are more likely to have positive co-creation experiences and actively engage in collaborative efforts. The positive relationship with co-creation participation suggests that the sense of belonging or attachment to the platform motivates users to actively contribute to co-creation initiatives.

Similarly, the sense of community proves to be a pivotal driver, exhibiting positive relationships with both co-creation experience (H2: b=0.394, p<0.001) and co-creation participation (H3: b=0.273, p<0.001). This underscores the influential role of a strong sense of community in shaping individuals' co-creation journeys. The positive associations with both experience and participation imply that fostering a sense of community within the co-creation environment contributes significantly to creating a positive and engaging experience, ultimately leading to increased participation from users.

Furthermore, innovativeness emerges as a noteworthy factor positively linked to co-creation experience (H8: b=0.22, p<0.001). This finding indicates that individuals with a propensity for innovation are likely to have more positive co-creation experiences. This

positive relationship underscores the importance of innovative thinking in enhancing the overall quality of co-creation engagements.

In addition, the positive relationship between co-creation experience and co-creation participation (H1: b=0.345, p<0.001) reinforces the notion that a positive and fulfilling co-creation experience contributes to increased participation. Individuals who have positive experiences in the co-creation process are more inclined to actively participate in collaborative activities, creating a reinforcing loop between experience and participation.

The outcomes detailed in Table 52 shed light on crucial insights. Firstly, the positive and significant interaction between platform identification and innovativeness (H9: b=0.092, p<0.001) underscores the profound impact of a user's identification with the platform and their innovativeness on enhancing the co-creation experience. This finding highlights the synergy between these two factors, revealing that users who identify strongly with the platform and exhibit innovativeness tend to have a more enriched co-creation experience.

The examination of interaction effects further illuminates the intricate dynamics at play within the co-creation framework. Notably, the positive and statistically significant interaction between the sense of community and innovativeness (H10: b=0.057, p=0.019) underscores the synergistic impact of a strong sense of community and individual innovativeness on the co-creation experience. This finding accentuates the collaborative nature of these two factors, suggesting that when individuals possess both a robust sense of community and a disposition for innovation, the resultant effect is a significantly enhanced co-creation experience. This underscores the idea that the social context, represented by a sense of community, can amplify the positive effects of individual traits, such as innovativeness, in the co-creation process.

In contrast, the non-significant and negative interaction between platform identification and co-creation experience for co-creation participation (H7: b=-0.004, p=0.916) introduces a nuanced perspective. This result implies that, while platform identification and co-creation experience are not strongly linked to participation, they also do not act as hindrances. Users may engage in co-creation participation irrespective of their level of identification with the platform. This nuanced relationship suggests that the platform itself may not be the primary driver of participation, and other factors, such as the co-creation experience, may play a more substantial role in motivating users to participate in collaborative activities.

The positive and significant interaction between the sense of community and co-creation experience (H4: b=0.143, p=0.005) underscores the influential role of a sense of community in fostering co-creation participation. This finding indicates that a robust sense of community, when combined with a positive co-creation experience, significantly contributes to an increased likelihood of participation. In essence, this implies that the social bonds within a community, when coupled with positive co-creation experiences, act as powerful motivators, encouraging users to actively participate in the collaborative creation process.

The three interactions that were positive and significant are plotted in Figure 10, Figure 11 and Figure 12 using the process proposed by Dawson (2014). This process involves calculating and showing predicted values:

- Co-creation experience under high and low value (one standard deviation above and below the mean) of sense of community and innovativeness.
- Co-creation experience under high and low value (one standard deviation above and below the mean) of platform identification and innovativeness.
- Co-creation participation under high and low value (one standard deviation above and below the mean) of co-creation experience and sense of community.

Simple slope analysis was also performed for the all interactions (Aiken & West, 1991).

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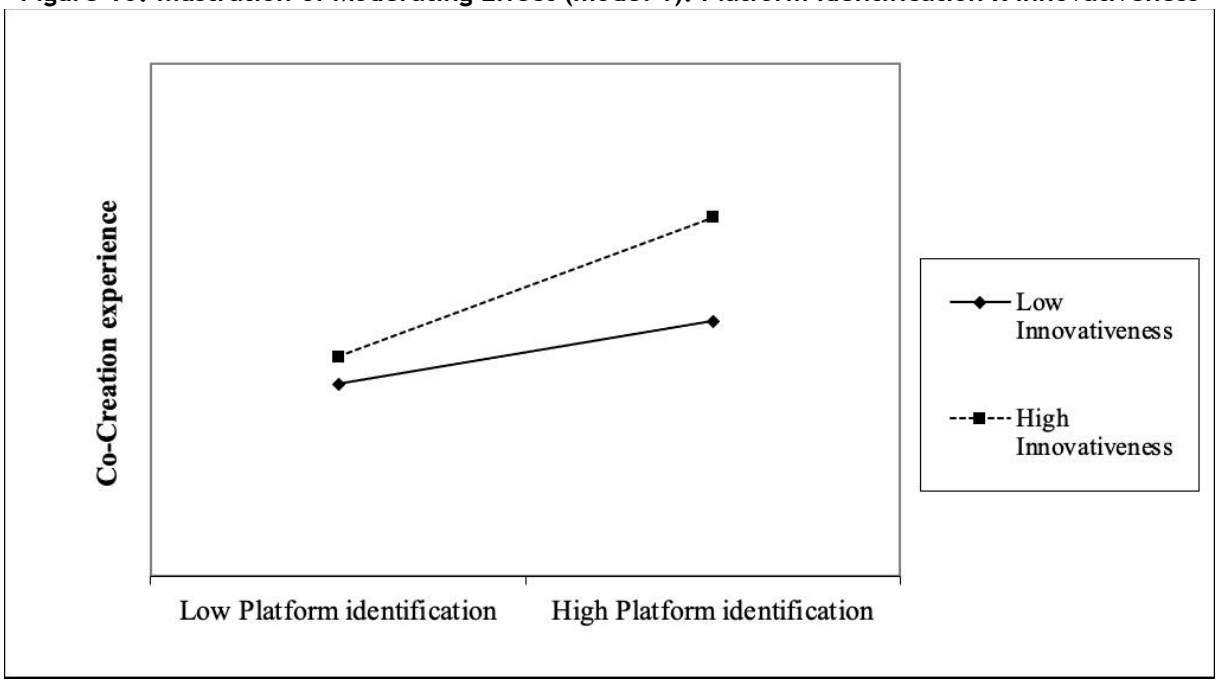
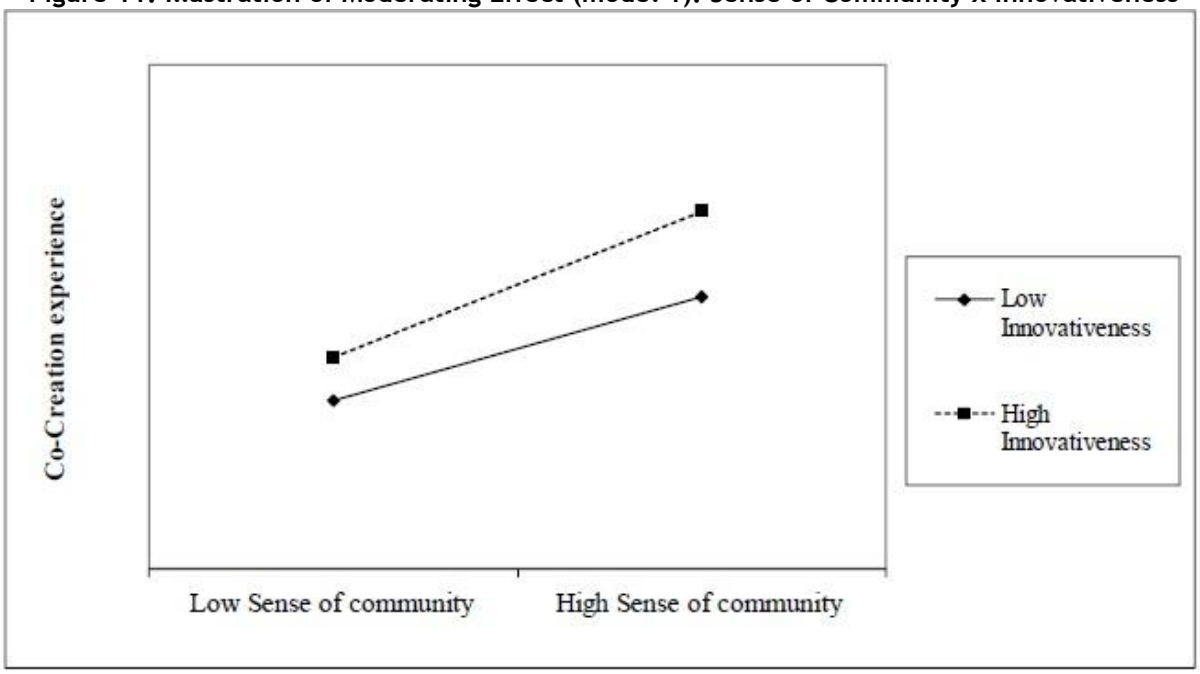
Figure 10. Illustration of Moderating Effect (model 1): Platform Identification x Innovativeness



Co-creation experience under high and low value of platform identification (one standard deviation above and below the mean: ±1.392), and high and low values of Innovativeness (one standard deviation above and below the mean: ±1.158). The two slopes were significantly different from each other (t= 7.663, $p < 0.01$).

Figure 11. Illustration of Moderating Effect (model 1): Sense of Community x Innovativeness



Co-creation experience under high and low values of sense of community (one standard deviation above and below the mean: ±1.253), and high and low values of Innovativeness

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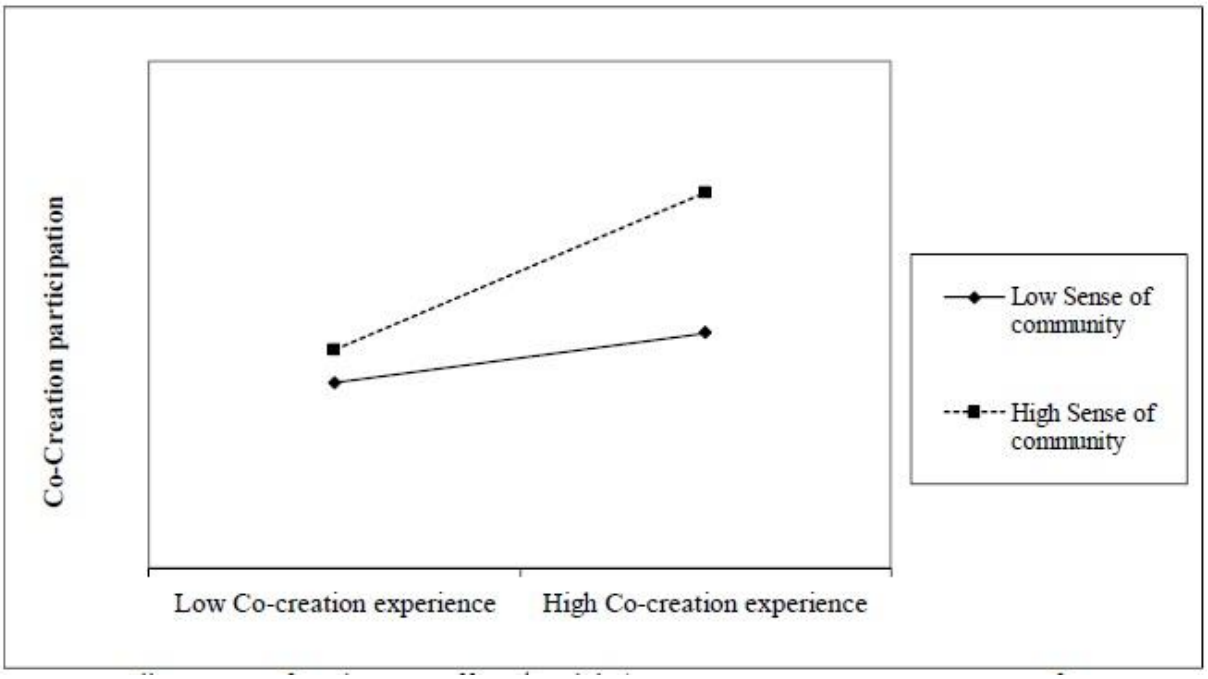
(one standard deviation above and below the mean: ±1.158). The two slopes were significantly different from each other (t = 9.129, $p < 0.01$).

Figure 12. Illustration of Moderating Effect (model 1): Co-Creation Experience x Sense of Community



Co-creation participation was examined across different levels of co-creation experience and sense of community, with distinctions made between high and low values, defined as one standard deviation above and below the mean (±1.183 for co-creation experience and ±1.253 for sense of community). The analysis revealed a significant difference between the two slopes (t = 6.629, p < 0.01).

Following this, the research undertook a comprehensive examination of the indirect ramifications stemming from platform identification and the sense of community in relation to co-creation participation. This exploration honed in on the intricate dynamics within the framework of co-creation experience. The investigation spanned diverse strata of innovativeness and sense of community, elucidated further in the detailed breakdown provided in Table 53.

The findings brought to light a discernible positive and indirect correlation linking platform identification, the sense of community, and active engagement in co-creation initiatives. It is noteworthy that these interconnections exhibited an augmented potency in circumstances characterized by heightened levels of innovativeness and a profound sense of community. This signifies that as innovativeness and community engagement intensify, the influence of platform identification and the sense of community on co-creation participation becomes more pronounced, underlining the nuanced interplay between these factors in shaping collaborative endeavors.

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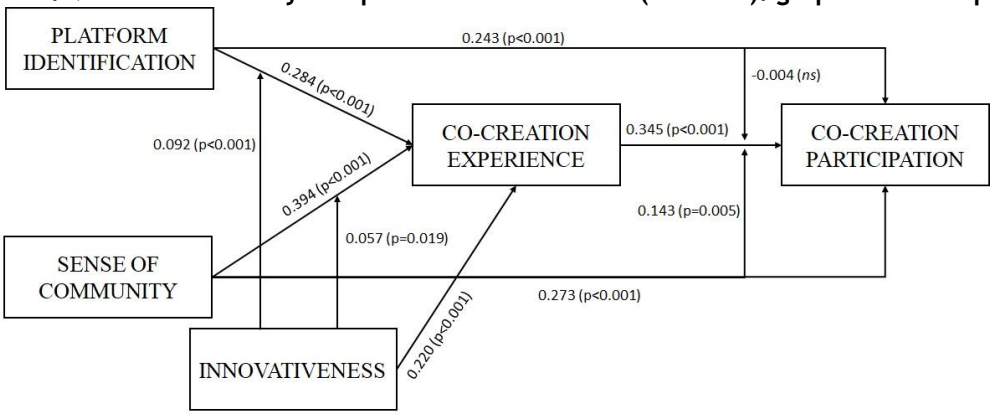
Table 53. Co-Creation Antecedents and Moderators (Model 1): Indirect effects on Co-Creation Participation via Co-Creation Experience

Indirect Effect	Innovativeness	Sense of Community	Boot effect	Boot SE	Bias-corrected LLCI	Bias-corrected ULCI
Platform Identification	Low (-1 SD)	Low (-1 SD)	0.029*	0.017	0.002	0.070
	Moderate (Mean)	Low (-1 SD)	0.047*	0.026	0.001	0.103
	High (+1 SD)	Low (-1 SD)	0.065*	0.036	0.000	0.140
	Low (-1 SD)	Moderate (Mean)	0.061***	0.016	0.034	0.100
	Moderate (Mean)	Moderate (Mean)	0.098***	0.021	0.063	0.146
	High (+1 SD)	Moderate (Mean)	0.135***	0.028	0.087	0.198
	Low (-1 SD)	High (+1 SD)	0.093***	0.024	0.051	0.152
	Moderate (Mean)	High (+1 SD)	0.149***	0.031	0.097	0.219
	High (+1 SD)	High (+1 SD)	0.205***	0.042	0.132	0.297
Sense of Community	Low (-1 SD)	Low (-1 SD)	0.054*	0.029	-0.001	0.114
	Moderate (Mean)	Low (-1 SD)	0.065*	0.035	-0.001	0.137
	High (+1 SD)	Low (-1 SD)	0.076*	0.042	-0.000	0.164
	Low (-1 SD)	Moderate (Mean)	0.113***	0.019	0.078	0.154
	Moderate (Mean)	Moderate (Mean)	0.136***	0.023	0.095	0.186
	High (+1 SD)	Moderate (Mean)	0.159***	0.030	0.108	0.223
	Low (-1 SD)	High (+1 SD)	0.172***	0.029	0.120	0.236
	Moderate (Mean)	High (+1 SD)	0.207***	0.036	0.146	0.285
	High (+1 SD)	High (+1 SD)	0.242***	0.045	0.167	0.344

***p< .01; **p< .05; *p< .10 / Source: Own elaboration

The next figure shows the conceptual relationship and the estimated parameters.

Figure 13. Model fit summary and parameters estimates (model 1): graphical description



χ2ms (2) = 4.897 (p > 0.05); χ2bs (19) = 844.915 (p < 0.001)
CFI 0.996; RMSEA = 0.046; SRMR = 0.004; Log likelihood: -10,113.972
Note: Standardized parameter estimate (significance level); ns=not significant

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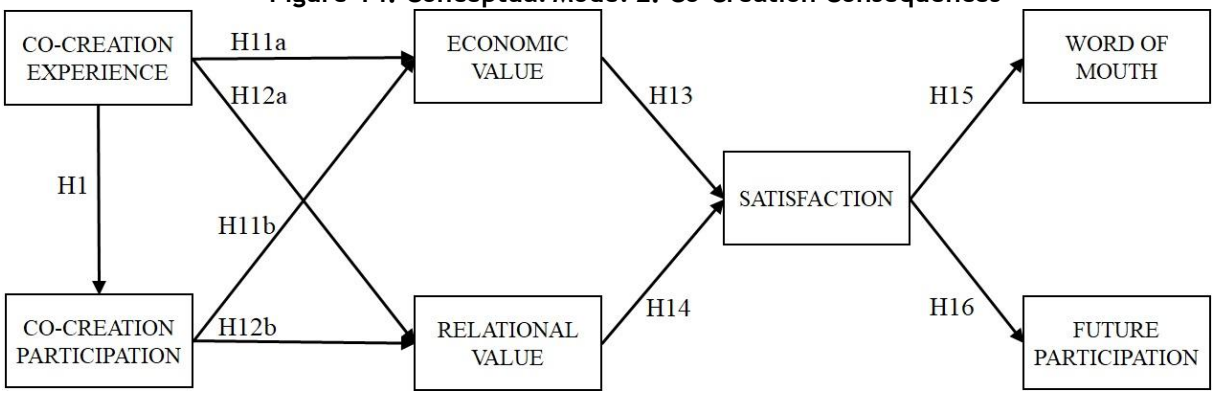
3.2.2.3 Co-Creation Consequences (Model 2): CFA and SEM

The subsequent visual representation introduces conceptual model 2, serving as a concise yet comprehensive overview of their research hypotheses aiming to delve into the

ramifications of co-creation. This conceptual model encapsulates a structured framework that guides their examination of the outcomes arising from collaborative value creation.

Figure 14. Conceptual Model 2: Co-Creation Consequences



First, the existence of common method bias was tested using two different methods. The Harman one-factor test showed that a single general factor did not account for most of the variance in an exploratory factor analysis (only 11.72%), suggesting that common method variance was unlikely to be a significant problem. The second method, the approach of Podsakoff et al. (2003), involved re-estimating a model with all the observed variables loading on one factor. The results of this model were unacceptable (Chi-square=9.449,508; df=665; RMSEA=0,139), further suggesting that common method bias was not a problem.

The following table presents the results of the confirmatory factor analysis concerning model fit, validity, composite reliability, and Cronbach's alpha.

Table 54. Co-Creation Consequences (Model 2): CFA - summary measurement results, validity and reliability

	Standardized Loadings
CO-CREATION EXPERIENCE - COMPETENCE (CR=0,927; AVE=0,762; CA=0,927)	
1. Participation in the development of the platform made me feel smart	0.881
2. Participation in the development of the platform made me feel competent	0.883
3. Participation in the development of the platform made me feel talented	0.866
4. Participation in the development of the platform made me feel intelligent	0.861
CO-CREATION EXPERIENCE - AUTONOMY (CR=0,927; AVE=0,761; CA=0,927)	
1. I had a great deal of freedom to make choices when participating in the development of the platform	0.862
2. I was able to express myself when participating in the development of the platform	0.860
3. I felt controlled when participating in the development of the platform (R)	0.882
4. I felt pressured when participating in the development of the platform (R)	0.884
CO-CREATION EXPERIENCE - ENJOYMENT (CR=0,909; AVE=0,626; CA=0,909)	
1. I enjoyed participating in the development of the platform	0.787
2. I had a good time participating in the development of the platform	0.786

	Standardized Loadings
3. Participation in the development of the platform was a lot of fun	0.783
4. Participation in the development of the platform was very satisfying	0.791
5. I felt annoyed when participating in the development of the platform (R)	0.809
6. I felt frustrated when participating in the development of the platform (R)	0.790
CO-CREATION PARTICIPATION (CR=0,894; AVE=0,628; CA=0,894)	
1. I spent a lot of time-sharing information about my needs and opinions with the staff during the service process.	0.781
2. I put a lot of effort into expressing my personal needs to the staff during the service process	0.791
3. I always provide suggestions to the staff for improving the service outcome	0.784
4. I have a high level of participation in the service process	0.808
5. I am very much involved in deciding how the services should be provided	0.799
ECONOMIC VALUE (CR=0,920; AVE=0,697; CA=0,920)	
1. My participation helps me receive higher quality services	0.829
2. My participation helps me receive more customized services	0.825
3. My participation helps me receive more professional services	0.836
4. My participation helps me receive more control over the services quality	0.847
5. My participation helps me receive less service failure	0.836
RELATIONAL VALUE (CR=0,917; AVE=0,787; CA=0,917)	
1. My participation helps me build a better relationship with the service provider.	0.881
2. My participation makes the service interaction more enjoyable.	0.877
3. My participation helps me receive relational approval from the service provider.	0.903
SATISFACTION (CR=0,843; AVE=0,574; CA=0,843)	
1. I am satisfied with the services provided.	0.767
2. This platform is a good option to do business with.	0.779
3. The service of this platform meets my expectations.	0.778
4. Overall, I am satisfied with the service provided by this platform.	0.705
WORD-OF-MOUTH (CR=0,809; AVE=0,585; CA=0,809)	
1. I say positive things about this platform to other people.	0.755
2. I recommend this platform to someone who seeks my advice.	0.783
3. I can recommend this platform without any concerns.	0.756
FUTURE PARTICIPATION (CR=0,925; AVE=0,756; CA=0,925)	
1. I'm interested in participating in other projects	0.880
2. I'm Interested to propose more ideas in the next events	0.874
3. I'm Interested in making new discoveries	0.868
4. I'm interested in customizing more the experience	0.855
MODEL FIT SUMMARY	
Chi-square=680,478, df=629; CMIN/DF=1,082 CFI=0.997; IFI=0.997; TLI=0.997; NFI=0.965 RMSEA=0,011	
Notation: *CR: Composite Reliability; AVE: Average Variance Extracted; CA: Cronbach Alpha*	

Source: Own elaboration

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Content validity was established through a comprehensive literature review to ensure that the measures met the requirements for content validity. Discriminant validity, convergent validity, and scale reliability were assessed using confirmatory factor analysis, following the guidelines of Gerbing and Anderson (1988).

The results of the confirmatory factor analysis (see previous table) showed that the overall chi-square for this model was 680.479 with 629 degrees of freedom, being the ratio of chi-square to degrees of freedom (CMIN/DF=1.082) less than the cutoff value of 3 (Bagozzi & Yi, 1988). Four measures of fit were examined: Comparative Fit Index (CFI=0.997), Incremental Fit Index (IFI=0.997), Tucker-Lewis Index (TLI=0.997), and Root Mean Square Error of Approximation (RMSEA=0.011). These values are within conventional cutoff values (Vandenberg & Lance, 2000), so the model was deemed acceptable.

To evaluate convergent validity, a meticulous examination of the individual loadings was conducted, and the outcomes revealed that all items effectively loaded onto their designated latent variables. Moreover, each of these loadings exhibited substantial and statistically significant values, underscoring a robust indication of convergent validity, in line with the criteria outlined by Anderson and Gerbing (1988). In the context of reliability, it is noteworthy that all constructs displayed commendable levels of composite reliability. These levels exceeded the benchmark of 0.60 recommended by Bagozzi and Yi (1988), signifying a high degree of internal consistency within the measurement model. This robust reliability underscores the dependability and stability of the constructs, further validating the accuracy and integrity of the research model.

- Co-Creation Experience
  - Competence - CR=0.927;
  - Autonomy – CR=0.927;
  - Enjoyment – CR=0.909;
- Co-Participation – CR=0.894;
- Economic Value– CR=0.920;
- Relational Value – CR=0.917;
- Satisfaction – CR=0.843;
- Word-of-Mouth – CR=0.809;
- Future Participation – CR=0.925.

To assess discriminant validity, construct intercorrelations were observed. The results showed that they were significantly different from 1, and that the shared variance between any two constructs (the square of their intercorrelations) was less than the average variance explained in the items by the construct (Fornell & Larcker, 1981). The Table 55 shows that the intercorrelations are greater than the square root of the Average Variance Extracted (AVE), indicating that discriminant validity is adequate for all latent variables.

In consideration of the intricate nature of the model and the necessity to concurrently examine the interconnections among various constructs, the researcher employed SEM utilizing the maximum likelihood method. This statistical approach enables them to assess and analyze the relationships among multiple variables simultaneously, providing a comprehensive understanding of the interplay within the model.

The specific model under scrutiny, referred to as base model 2, was subjected to estimation through the SEM framework. The obtained results have been meticulously tabulated for clarity and are presented in the subsequent table. This analytical technique allows for a thorough exploration of the latent variables and their associated pathways, shedding light on the intricate web of relationships within the model. The Table 56 serves as a

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visual representation of the statistical outcomes, facilitating a nuanced interpretation of the findings derived from the structural equation modeling analysis.

Table 55. Co-Creation Consequences (Model 2): CFA - Correlations between constructs and AVE

CONSTRUCT	1	2	3	4	5	6	7	8	9	AVE
1. COMPETENCE	**0.873**									**0.762**
2. AUTONOMY	0.470	**0.872**								**0.761**
3. ENJOYMENT	0.409	0.230	**0.791**							**0.626**
4. CO-CREATION PARTICIPATION	0.524	0.441	0.433	**0.793**						**0.628**
5. ECONOMIC VALUE	0.620	0.480	0.461	0.792	**0.835**					**0.697**
6. RELATIONAL VALUE	0.501	0.442	0.421	0.713	0.710	**0.887**				**0.787**
7. SATISFACTION	0.502	0.391	0.372	0.710	0.668	0.604	**0.758**			**0.574**
8. WORD-OF-MOUTH	0.476	0.401	0.372	0.559	0.613	0.454	0.493	**0.765**		**0.585**
9. FUTURE PARTICIPATION	0.235	0.176	0.210	0.389	0.517	0.430	0.314	-0.099	**0.869**	**0.756**

Note: Diagonal is the square root of the AVE / Source: Own elaboration

Table 56. Co-Creation Consequences (Model 2): model fit summary and parameters estimates

HYP.	RELATIONSHIPS	STAND. PAR. ESTIMATE	P	TEST
H1	*CO-CREATION EXPERIENCE → CO-CREATION PARTICIPATION*	0.745	***	*Supported*
H11a	*CO-CREATION EXPERIENCE → ECONOMIC VALUE*	0.586	***	*Supported*
H11b	*CO-CREATION PARTICIPATION → ECONOMIC VALUE*	0.367	***	*Supported*
H12a	*CO-CREATION EXPERIENCE → RELATIONAL VALUE*	0.464	***	*Supported*
H12b	*CO-CREATION PARTICIPATION → RELATIONAL VALUE*	0.373	***	*Supported*
H13	*ECONOMIC VALUE→ SATISFACTION*	0.564	***	*Supported*
H14	*RELATIONAL VALUE → SATISFACTION*	0.250	***	*Supported*
H15	*SATISFACTION → WORD-OF-MOUTH*	0.540	***	*Supported*
H16	*SATISFACTION → FUTURE PARTICIPATION*	0.360	***	*Supported*
	2nd ORDER-PARAMETERS			
	CO-CREATION EXPERIENCE → COMPETENCE	0.729	***	
	CO-CREATION EXPERIENCE → AUTONOMY	0.579	***	
	CO-CREATION EXPERIENCE → ENJOYMENT	0.538	***	
	MODEL FIT SUMMARY:			
	Chi-square=1,141.566, DF=653; CMIN/DF=1.748; CFI=0.974; IFI=0.974; TLI=0.972; NFI=0.941; RMSEA=0.033			
	Note: * p<0.05; ** p<0.01; *** p<0.001; ns=not Significant			

Source: Own elaboration

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For the co-creation experience construct, second-order constructs were used, namely autonomy, competence, and task enjoyment, following the instructions of Dahl and Moreau (2007) and Füller et al. (2011)

The results from the estimation of SEM and parameter estimates show that the overall chi-square for this model was 1,141.566 with 653 degrees of freedom, being the ratio of chi-square to degrees of freedom (CMIN/DF=1.748) less than the cutoff value of 3 (Bagozzi & Yi, 1988). Four measures of fit were examined: Comparative Fit Index (CFI=0.974), Incremental Fit Index (IFI=0.974), Tucker-Lewis Index (TLI=0.972), and Root Mean Square Error of Approximation (RMSEA=0.034). These values are within conventional cutoff values (Vandenberg & Lance, 2000), so the model was deemed acceptable. Next, the test of hypotheses proposed in this model will be examined.

This study reported in Table 56 that co-creation experience is positively related to co-creation participation (H1: b=0.745, p<0.001), economic value (H11a: b=0.586, p<0.001), and relational value (H12a: b=0.464, p<0.001). co-creation participation is also positively related to economic value (H11b: b=0.367, p<0.001), and relational value (H12b: b=0.373, p<0.001). economic value is positively related to satisfaction (H13: b=0.564, p<0.001), and relational value is positively related to satisfaction (H14: b=0.25, p<0.001). Finally, satisfaction is positively related to word-of-mouth (H15: b=0.540, p<0.001), and future participation (H16: b=0.360, p<0.001).

In order to conduct a more in-depth examination of the impact of the variables incorporated in model 2, a rigorous analytical approach was employed. The Bootstrap method, utilizing Maximum Likelihood calculations, was chosen for this purpose. This involved generating 1000 samples, and the analysis was carried out with Bias-corrected confidence intervals set at 95%, adhering to the foundational assumptions outlined by Fox (1980) and Kline (2011).

The results stemming from the meticulous application of the Bootstrap technique to model 2 have been thoroughly documented, providing a comprehensive and detailed account of the statistical analyses. These findings are presented across Table 57, Table 58, Table 59, Table 60, Table 61.

Table 57. Co-Creation Consequences (Model 2): Direct, indirect and Total effect of Co-Creation Experience

Independent Variable: Co-Creation Experience						
Dependent Variable	**Effect**	**B**	**SE**	**Lower Bounds (BC)**	**Upper Bounds (BC)**	**Sig.**
Autonomy (2º order)	Direct	0.579	0.044	0.492	0.661	0.002
	Indirect	---	---	---	---	---
	Total	0.579	0.044	0.492	0.661	0.002
Enjoyment (2º order)	Direct	0.538	0.040	0.456	0.611	0.002
	Indirect	---	---	---	---	---
	Total	0.538	0.040	0.456	0.611	0.002
Competence (2º order)	Direct	0.729	0.032	0.662	0.793	0.003
	Indirect	---	---	---	---	---
	Total	0.729	0.032	0.662	0.793	0.003
Co-Creation Participation	Direct	0.745	0.038	0.670	0.827	0.002
	Indirect	---	---	---	---	---
	Total	0.745	0.038	0.670	0.827	0.002
Economic Value	Direct	0.586	0.079	0.444	0.752	0.002
	Indirect	0.273	0.057	0.146	0.373	0.002
	Total	0.860	0.028	0.807	0.913	0.001

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Independent Variable: Co-Creation Experience						
Dependent Variable	**Effect**	**B**	**SE**	**Lower Bounds (BC)**	**Upper Bounds (BC)**	**Sig.**
Relational Value	Direct	0.464	0.074	0.336	0.626	0.001
	Indirect	0.278	0.051	0.166	0.371	0.002
	Total	0.742	0.030	0.688	0.800	0.001
Satisfaction	Direct	---	---	---	---	---
	Indirect	0.671	0.028	0.616	0.731	0.002
	Total	0.671	0.028	0.616	0.731	0.002
Word-of-Mouth	Direct	---	---	---	---	---
	Indirect	0.362	0.031	0.306	0.428	0.002
	Total	0.362	0.031	0.306	0.428	0.002
Future Participation	Direct	---	---	---	---	---
	Indirect	0.241	0.033	0.180	0.309	0.001
	Total	0.241	0.033	0.180	0.309	0.001

Source: Own elaboration

The independent variable co-creation only has positive and relevant effects that are exclusively direct on the variables:

- 2nd order associated with it, namely, Autonomy (B=0.579; p=0.002), Enjoyment (B=0.538; p=0.002) and Competence (B=0.729; p=0.003);
- Co-Creation Participation (B=0.745; p=0.002).

The co-creation experience variable has a direct and positive effect on economic value (B=0.586, p=0.002), and an indirect positive effect that is mediated by co-creation participation (B=0.273, p=0.002). The co-creation experience variable also has a direct and positive effect on relational value (B=0.464, p=0.001), and an indirect positive effect that is mediated by co-creation participation (B=0.278, p=0.002). The co-creation experience variable has only an indirect and positive effect on satisfaction (B=0.671, p=0.002), which is mediated by co-creation participation, economic value, and relational value. Similarly, the co-creation experience variable has only indirect and positive effects on word-of-mouth (B=0.362, p=0.002) and future participation (B=0.241, p=0.001). These effects are mediated by co-creation participation, economic value, relational value, and satisfaction.

Table 58. Co-Creation Consequences (Model 2): Direct, Indirect and Total effect of Co-Creation Participation

Independent Variable: Co-Creation Participation						
Dependent Variable	**Effect**	**B**	**SE**	**Lower Bounds (BC)**	**Upper Bounds (BC)**	**Sig.**
Economic Value	Direct	0.367	0.083	0.179	0.512	0.003
	Indirect	---	---	---	---	---
	Total	0.367	0.083	0.179	0.512	0.003
Relational Value	Direct	0.373	0.076	0.195	0.503	0.003
	Indirect	---	---	---	---	---
	Total	0.373	0.076	0.195	0.503	0.003
Satisfaction	Direct	---	---	---	---	---
	Indirect	0.300	0.062	0.157	0.409	0.003
	Total	0.300	0.062	0.157	0.409	0.003
Word-of-Mouth	Direct	---	---	---	---	---
	Indirect	0.162	0.035	0.085	0.228	0.003
	Total	0.162	0.035	0.085	0.228	0.003
Future	Direct	---	---	---	---	---

Independent Variable: Co-Creation Participation						
Dependent Variable	**Effect**	**B**	**SE**	**Lower Bounds (BC)**	**Upper Bounds (BC)**	**Sig.**
Participation	Indirect	0.108	0.026	0.058	0.163	0.003
	Total	0.108	0.026	0.058	0.63	0.003

Source: Own elaboration

The co-creation participation variable has a direct and positive effect on economic value (B=0.637, p=0.003) and relational value (B=0.373, p=0.003). The co-creation participation variable also has an indirect and positive effect on satisfaction (B=0.300, p=0.003), which is mediated by economic value and relational value. Similarly, the co-creation participation variable has indirect and positive effects on word-of-mouth (B=0.162, p=0.003) and future participation (B=0.108, p=0.003). These effects are mediated by economic value, relational value, and satisfaction.

Table 59. Co-Creation Consequences (Model 2): Direct, Indirect and Total effect of Economic Value

Independent Variable: Economic Value						
Dependent Variable	**Effect**	**B**	**SE**	**Lower Bounds (BC)**	**Upper Bounds (BC)**	**Sig.**
Satisfaction	Direct	0.564	0.051	0.461	0.665	0.002
	Indirect	---	---	---	---	---
	Total	0.564	0.051	0.461	0.665	0.002
Word-of-Mouth	Direct	---	---	---	---	---
	Indirect	0.305	0.038	0.234	0.387	0.002
	Total	0.305	0.038	0.234	0.387	0.002
Future Participation	Direct	---	---	---	---	---
	Indirect	0.203	0.032	0.145	0.269	0.001
	Total	0.203	0.032	0.145	0.269	0.001

Source: Own elaboration

The economic value variable has a direct and positive effect on satisfaction (B=0.564, p=0.002). Additionally, the economic value variable has an indirect and positive effect on word-of-mouth (B=0.305, p=0.002) and future participation (B=0.203, p=0.001). These effects are mediated by satisfaction.

Table 60. Co-Creation Consequences (Model 2): Direct, Indirect and Total effect of Relational Value

Independent Variable: Relational Value						
Dependent Variable	**Effect**	**B**	**SE**	**Lower Bounds (BC)**	**Upper Bounds (BC)**	**Sig.**
Satisfaction	Direct	0.250	0.053	0.147	0.356	0.002
	Indirect	---	---	---	---	---
	Total	0.250	0.053	0.147	0.356	0.02
Word-of-Mouth	Direct	---	---	---	---	---
	Indirect	0.135	0.028	0.052	0.140	0.001
	Total	0.135	0.028	0.052	0.140	0.001
Future Participation	Direct	---	---	---	---	---
	Indirect	0.090	0.022	0.052	0.140	0.001
	Total	0.090	0.022	0.052	0.140	0.001

Source: Own elaboration

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The relational value variable has a direct and positive effect on satisfaction (B=0.250, p=0.002). Additionally, the relational value variable has an indirect and positive effect on word-of-mouth (B=0.135, p=0.001) and future participation (B=0.090, p=0.001). These effects are mediated by satisfaction.

Table 61. Co-Creation Consequences (Model 2): Direct, Indirect and Total effect of Satisfaction

Independent Variable: Satisfaction						
Dependent Variable	Effect	B	SE	Lower Bounds (BC)	Upper Bounds (BC)	Sig.
Word-of-Mouth	Direct	0.540	0.035	0.472	0.610	0.002
	Indirect	---	---	---	---	---
	Total	0.540	0.035	0.472	0.610	0.002
Future Participation	Direct	0.360	0.042	0.276	0.443	0.002
	Indirect	---	---	---	---	---
	Total	0.360	0.042	0.276	0.443	0.002

Source: Own elaboration

The satisfaction variable only has a direct positive effect on word-of-mouth (B=0.540, p=0.002) and future participation (B=0.360, p=0.002).

The next table summarizes all the results of the direct, indirect, and total effects observed in the previous tables.

Table 62. Co-Creation Consequences (Model 2): Summary

Variable		**Direct Effect**	**Indirect Effect**	**Total Effect**
Independent	**Dependent**			
Co-Creation Experience	Autonomy (2ª ord.)	0.579 (***)		0.579 (***)
	Enjoyment (2ª ord.)	0.538 (***)		0.538 (***)
	Competence (2ª ord.)	0.729 (***)		0.729 (***)
	Co-Creation Participation	0.745 (***)		0.745 (***)
	Economic Value	0.586 (***)	0.273 (***)	0.860 (***)
	Relational Value	0.464 (***)	0.278 (***)	0.742 (***)
	Satisfaction		0.671 (***)	0.671 (***)
	Word-of-Mouth		0.362 (***)	0.362 (***)
	Future Participation		0.241 (***)	0.241 (***)
Co-Creation Participation	Economic Value	0.367 (***)		0.367 (***)
	Relational Value	0.373 (***)		0.373 (***)
	Satisfaction		0.300 (***)	0.300 (***)
	Word-of-Mouth		0.162 (***)	0.162 (***)
	Future Participation		0.108 (***)	0.108 (***)
Economic Value	Satisfaction	0.564 (***)		0.564 (***)
	Word-of-Mouth		0.305 (***)	0.305 (***)
	Future Participation		0.203 (***)	0.203 (***)
Relational Value	Satisfaction	0.250 (***)		0.250 (***)
	Word-of-Mouth		0.135 (***)	0.135 (***)
	Future Participation		0.090 (***)	0.090 (***)

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Variable		Direct Effect	Indirect Effect	Total Effect
Independent	Dependent			
Satisfaction	Word-of-Mouth	0.540 (***)		0.540 (***)
	Future Participation	0.360 (***)		0.360 (***)

* p<0.10, ** p<0.05, *** p<0.01 / Source: Own elaboration

The following table shows only the direct effects for model 2.

Table 63. Co-Creation Consequences (Model 2): Direct effects analyses

Dependent Variable	Independent Variable				
	CC Experience	CC Participation	Eco. Value	Rel. Value	Satisfaction
Autonomy (2ª ord.)	0.579 (***)				
Enjoyment (2ª ord.)	0.538 (***)				
Competence (2ª ord.)	0.729 (***)				
CC Participation	0.745 (***)				
Economic Value	0.586 (***)	0.367 (***)			
Relational Value	0.464 (***)	0.373 (***)			
Satisfaction			0.564 (***)	0.250 (***)	
Word-of-Mouth					0.540 (***)
Future Participation					0.360 (***)

Notation: CC Experience – Co-Creation Experience, CC Participation – Co-Creation Participation, Eco. Value – Economic Value, Rel Value – Relational Value, * p<0.10, ** p<0.05, *** p<0.01 - Source: Own elaboration

The co-creation experience has a very strong influence on the variables it has a direct influence on, namely co-creation participation (B=0.745, p<0.01), economic value (B=0.586, p<0.01), and relational value (B=0.464, p<0.01). It also has a strong influence on its second-order variables, namely autonomy (B=0.579, p<0.01), enjoyment (B=0.538, p<0.01), and competence (B=0.742, p<0.01).

Co-creation participation does not have as strong an influence on the variables as co-creation experience, namely on the variables economic value (B=0.367, p<0.01) and relational value (B=0.373, p<0.01).

The satisfaction variable is directly influenced by two variables, but the economic value variable (B=0.564, p<0.01) has a stronger influence than the relational value variable (B=0.250, p<0.01). In turn, satisfaction has a greater influence on the word-of-mouth variable (B=0.540, p<0.01) than on future participation (B=0.360, p<0.01).

The following table shows only the indirect effects for model 2.

Table 64. Co-Creation Consequences (Model 2): Indirect effects analyses

Dependent Variable	Independent Variable				
	CC Experience	CC Participation	Eco. Value	Rel. Value	Satisfaction
Autonomy (2ª ord.)					
Enjoyment (2ª ord.)					
Competence (2ª ord.)					
CC Participation					

Dependent Variable	Independent Variable				
	CC Experience	CC Participation	Eco. Value	Rel. Value	Satisfaction
Economic Value	0.273 (***)				
Relational Value	0.278 (***)				
Satisfaction	0.671 (***)	0.300 (***)			
Word-of-Mouth	0.362 (***)	0.162 (***)	0.305 (***)	0.135 (***)	
Future Participation	0.241 (***)	0.108 (***)	0.203 (***)	0.090 (***)	

Notation: CC Experience – Co-Creation Experience, CC Participation – Co-Creation Participation, Eco. Value – Economic Value, Rel. Value – Relational Value, * p<0.10, ** p<0.05, *** p<0.01
Source: Own elaboration

In the analysis of indirect effects within the model, it becomes evident that co-creation experience emerges as the most influential factor across all variables. Its impact is particularly pronounced on those variables it does not directly affect. Notably, satisfaction exhibits the greatest influence, with a coefficient (B=0.671 (p<0.01), followed by word-of-mouth (B=0.362, p<0.01), relational value (B=0.278, p<0.01), economic value (B=0.273, p<0.01), and future participation (B=0.241, p<0.01).

In comparison, co-creation participation, while still influential, exerts a smaller effect on the model. Its most significant impact is observed on satisfaction (B=0.300, p<0.01), albeit on a much smaller scale than co-creation experience. Co-creation participation's influence diminishes considerably on other variables, especially on word-of-mouth (B=0.162, p<0.01) and future participation (B=0.108, p<0.01).

Furthermore, economic value and relational value both contribute to indirect effects on the same set of variables. However, economic value emerges as the more potent influence, particularly on word-of-mouth (B=0.305, p<0.01) and future participation (B=0.203, p<0.01). In contrast, relational value exhibits a comparatively smaller impact on word-of-mouth (B=0.135, p<0.01) and future participation (B=0.090, p<0.01).

This nuanced understanding of the indirect effects elucidates the complex interplay between co-creation experience, co-creation participation, economic value, and relational value within the overarching model, providing valuable insights into the dynamics of these variables and their consequential impacts on various aspects of customer engagement and satisfaction.

The following table shows only the total effects for model 2.

Table 65. Co-Creation Consequences (Model 2): Total effects analyses

Dependent Variable	Independent Variable				
	CC Experience	CC Participation	Eco. Value	Rel. Value	Satisfaction
Autonomy (2ª ord.)	0.579 (***)				
Enjoyment (2ª ord.)	0.538 (***)				
Competence (2ª ord.)	0.729 (***)				
CC Participation	0.745 (***)				
Economic Value	0.860 (***)	0.367 (***)			
Relational Value	0.742 (***)	0.373 (***)			
Satisfaction	0.671 (***)	0.300 (***)	0.564 (***)	0.250 (***)	

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Dependent Variable	Independent Variable				
	CC Experience	CC Participation	Eco. Value	Rel. Value	Satisfaction
Word-of-Mouth	0.362 (***)	0.162 (***)	0.305 (***)	0.135 (***)	0.540 (***)
Future Participation	0.241 (***)	0.108 (***)	0.203 (***)	0.090 (***)	0.360 (***)

Notation: CC Experience – Co-Creation Experience, CC Participation – Co-Creation Participation, Eco. Value – Economic Value, Rel Value – Relational Value, * p<0.10, ** p<0.05, *** p<0.01
Source: Own elaboration

The comprehensive examination of the table provides a holistic perspective on the total effects of the variables within the model, underscoring the prominent role played by the variable co-creation experience. This variable distinctly stands out as the dominant force, wielding significant influence over almost every aspect of the model and, consequently, exerting a substantial impact on a multitude of variables.

Upon closer inspection, it is evident that co-creation experience exercises a robust influence across various dimensions. Notably, it demonstrates a compelling impact on economic value (B=0.860, p<0.01), relational value (B=0.742, p<0.01), co-creation participation (B=0.745, p<0.01), and satisfaction (B=0.671, p<0.01). Additionally, co-creation experience extends its powerful influence to second-order variables, such as autonomy (B=0.579, p<0.01), enjoyment (B=0.538, p<0.01), and competence (B=0.729, p<0.01). However, it is noteworthy that co-creation experience does not exert a particularly strong influence on word-of-mouth (B=0.362, p<0.01) and future participation (B=0.241, p<0.01).

In the intricate network of relationships within the model, satisfaction emerges as a pivotal factor, wielding the strongest influence on word-of-mouth (B=0.540, p<0.01) and future participation (B=0.360, p<0.01). Co-creation participation, while impactful, falls slightly behind co-creation experience in influencing word-of-mouth (B=0.162, p<0.01) and future participation (B=0.108, p<0.01).

Furthermore, economic value and relational value, although influencing the same variables, exhibit disparities in their impact. Economic value takes precedence, exerting a greater influence on satisfaction (B=0.564, p<0.01), word-of-mouth (B=0.305, p<0.01), and future participation (B=0.203, p<0.01) compared to relational value's impact on satisfaction (B=0.250, p<0.01), word-of-mouth (B=0.135, p<0.01), and future participation (B=0.090, p<0.01).

The dominance of co-creation experience manifests as the most influential variable throughout the model, shaping the intricate dynamics of the relationships among various factors. This nuanced understanding sheds light on the pivotal role of co-creation experience in influencing key outcomes within the studied framework.

The Figure 15 shows the conceptual relationship and the estimated parameters.

In this section, the statistical description of the collected data was performed. The conceptual models were tested using Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM). This section concluded with the results of each conceptual sub-model analysis.

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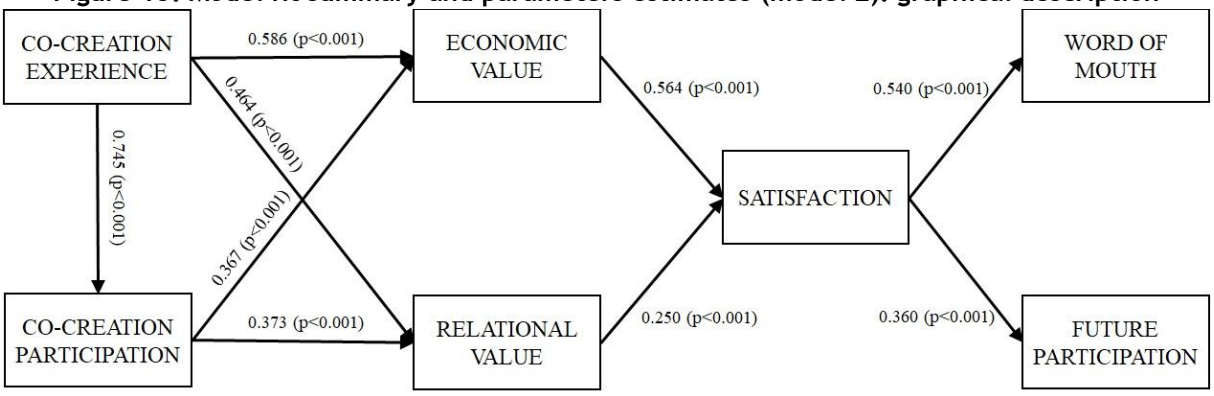
Figure 15. Model fit summary and parameters estimates (model 2): graphical description



Chi-square=1,141.566, df=653; CMIN/df=1.748
CFI=0.974; IFI=0.974; TLI=0.972; NFI=0.941; RMSEA=0.033
Note: Standardized parameter estimate (significance level); ns=not significant

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4 CONCLUSIONS

4.1 INTRODUCTION

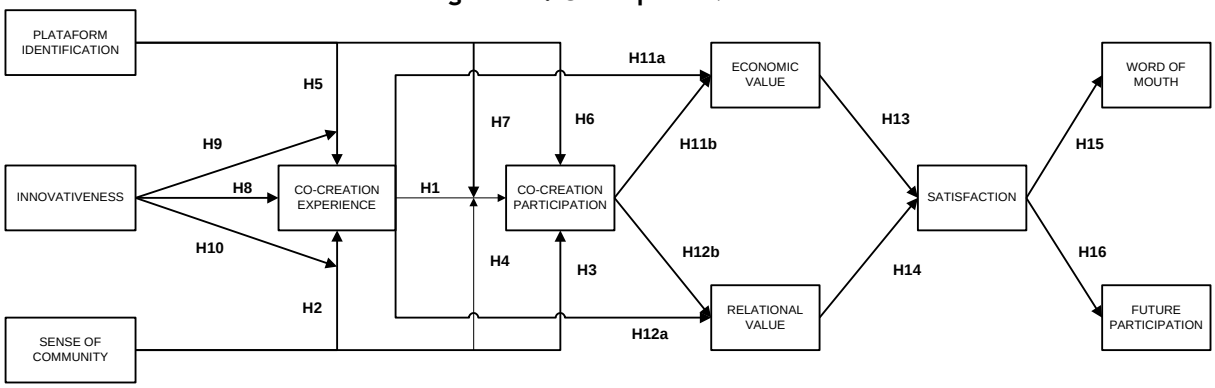
This subsection serves as a concise introduction to the scope and objectives of the thesis. It offers an overview of the conceptual model that has been developed, the research models that have arisen from it, and the hypotheses that have been formulated and subsequently tested during this study.

The central objective of this thesis is to delve into the intricate dynamics of consumer co-creation within open-source markets, with a particular focus on the domain of software development, where volunteers play a pivotal role by making substantial contributions. Through rigorous research endeavors, this study aspires to contribute to a more comprehensive understanding of the multifaceted factors that underpin consumer co-creation within such markets.

In the pursuit of this objective, the study embarks on an exploration of diverse dimensions of consumer co-creation. This encompasses an investigation into the motivations that drive volunteers to contribute their time and expertise and the outcomes obtained from this contribution. By acquiring a deeper comprehension of these facets, this thesis aims to offer valuable insights that can be leveraged by businesses aiming to effectively engage consumers within open-source markets. Furthermore, it aims to provide policymakers with a foundation to advance initiatives that foster the expansion of such markets. In addition to its practical implications, this research is poised to enrich the academic literature across multiple domains, including consumer co-creation, open-source markets, and the realm of software development. As such, it holds the potential to inform and shape future research endeavors in these areas.

Hence, the thesis aims to investigate the antecedents and moderators that influence co-creation, as well as the consequences of co-creation. To achieve this goal, the researcher developed a conceptual model (Figure 16), which was later divided into two models for analysis.

Figure 16. Conceptual Model



The first model (Figure 17) focuses on the antecedents and moderating effects on co-creation. This model aims to identify the factors that influence the likelihood of consumers engaging in co-creation activities with firms, as well as the factors that moderate the relationship between antecedents and co-creation. To the first model, the variables platform identification, sense of community, and innovativeness were considered antecedents of co-creation. Of these, innovativeness was considered to have a direct influence on the co-creation experience. The

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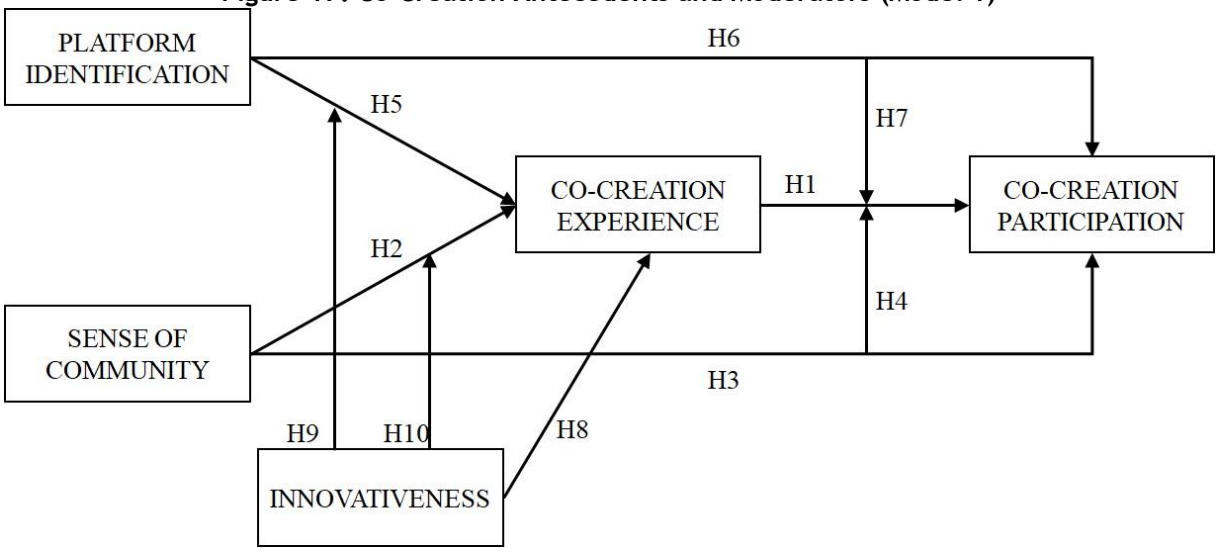
other two were considered direct antecedents of both co-creation experience and co-creation participation.

At the moderation level, innovativeness was considered to influence the direct relationship between platform identification and the co-creation experience, as well as the direct relationship between sense of community and the co-creation experience. Also at the moderation level, platform identification and sense of community were found to influence the direct relationship between co-creation experience and co-creation participation.

In summary, for the model analyzing the co-creation antecedents and moderators, the following variables were considered:

- Platform identification.
- Sense of community.
- Innovativeness.
- Co-creation experience.
- Co-creation participation.

Figure 17. Co-Creation Antecedents and Moderators (Model 1)



The second model (Figure 18) focuses on the consequences of co-creation. This model aims to identify the outcomes of co-creation for both consumers and firms. For this second model, economic value and relational value were considered as direct consequences of co-creation. To analyze the indirect consequences, satisfaction, word-of-mouth, and future participation were considered.

At the model level, it was considered that co-creation experience has a direct influence on co-creation participation. Next, it was considered that co-creation experience and co-creation participation have a direct influence on economic value and relational value. To analyze the indirect effects, economic value and relational value were considered mediating variables through which co-creation impacts satisfaction. Similarly, satisfaction was considered a mediating variable that leads to word-of-mouth and future participation.

In short, for the model that analyzes consequences of co-creation, the variables considered were:

- Co-creation experience.
- Co-creation participation.
- Economic value.

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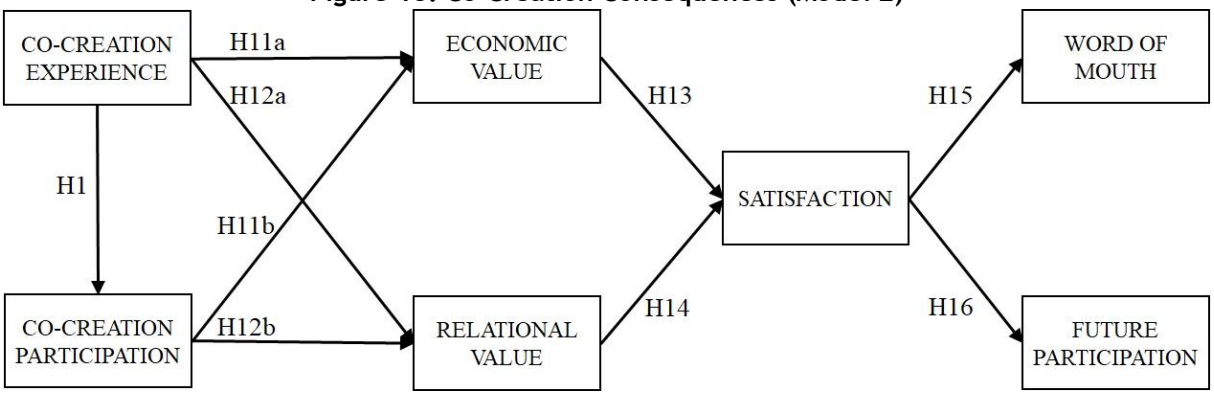
- Relational value.
- Satisfaction.
- Word-of-mouth.
- Future participation.

Figure 18. Co-Creation Consequences (Model 2)



In the progression of advancing the development of the conceptual model, the researcher undertook a strategic process of dividing it into more focused sub-models. This meticulous subdivision aimed to facilitate a comprehensive exploration of the intricate dynamics that underlie the phenomena of interest. Within this methodical approach, several hypotheses were meticulously formulated, serving as fundamental constructs that guided the researcher's investigation into the complex relationships at play among diverse variables.

The subsequent table serves as a detailed repository, systematically outlining the carefully crafted hypotheses and presenting the results derived from a thorough analysis of the amassed data. Through the systematic dissection of the overarching conceptual model into more manageable segments, the researcher aimed to unveil the inherent complexities within the phenomena under investigation. This deliberate strategy not only allowed for a finer examination of the dynamics but also provided a clearer framework for interpreting and comprehending the empirical evidence.

Following the methodical testing of the hypotheses against the meticulously collected data, these hypotheses have now transformed into intellectual guideposts that illuminate the researcher's ongoing quest to unravel the intricacies embedded within the conceptual model. This intentional and structured methodology not only serves to fortify the robustness of the analysis but also stands as a noteworthy contribution to the broader scholarly discourse encompassing the subject matter.

In the subsequent sections, a detailed and systematic exploration of each individual hypothesis unfolds. This exploration goes beyond mere scrutiny, delving into the nuanced implications of each hypothesis. The unfolding narrative not only elucidates the intricacies of the relationships between variables but also weaves a comprehensive story that captures the essence of the researcher's analytical endeavors.

This narrative, in its richness and depth, serves as a testament to the insights garnered from the extensive analytical efforts undertaken by the researcher. By meticulously examining each specific hypothesis, the narrative contributes significantly to our understanding of the complex interplay and dependencies within the conceptual model. Moreover, it fosters a more profound comprehension of the broader implications and applications of the study, providing a valuable resource for scholars and practitioners alike who seek a deeper understanding of the subject matter. In essence, the narrative acts as a bridge between the empirical findings

and their broader implications, fostering a more holistic and informed perspective within the academic community.

Table 66. Hypotheses Testing: Summary

HYPOTHESIS	PATH	RESULT
H1	Co-Creation Experience is positively related to Co-Creation Participation	Supported
H2	Sense of Community is positively related to Co-Creation Experience	Supported
H3	Sense of Community is positively related to Co-Creation Participation	Supported
H4	Sense of Community moderates the relationship between Co-Creation Experience and Co-Creation Participation	Supported
H5	Platform Identification is positively related to Co-Creation Experience	Supported
H6	Platform Identification is positively related to Co-Creation Participation	Supported
H7	Platform Identification moderates the relationship between Co-Creation Experience and Co-Creation Participation	Not Supported
H8	Innovativeness is positively related to Co-Creation Experience	Supported
H9	Innovativeness moderates the relationship between Platform Identification and Co-Creation Experience	Supported
H10	Innovativeness moderates the relationship between Sense of Community and Co-Creation Experience	Supported
H11a	Co-Creation Experience is positively related to Economic Value	Supported
H11b	Co-Creation Participation is positively related to Economic Value	Supported
H12a	Co-Creation Experience is positively related to Relational Value	Supported
H12b	Co-Creation Participation is positively related to Relational Value	Supported
H13	Economic Value is positively related to Satisfaction	Supported
H14	Relational Value is positively related to Satisfaction	Supported
H15	Satisfaction have is positively related to Positive Word-of-Mouth	Supported
H16	Satisfaction have is positively related to Future Participation	Supported

Source: Own elaboration

In this subsection a short introduction was given of what was studied throughout the thesis. The conceptual model that was developed was also presented, together with the research models that gave rise to it. Finally, the hypotheses that were developed and their results resulting from the research that was done were presented.

4.2 DISCUSSION

In this section, the discussion focuses on the results of the research, which are categorized into several key themes. Firstly, an overarching assessment is provided, followed by a breakdown of discussions related to co-creation and its background. Then, the results concerning moderators are analyzed, and finally, the direct and indirect impacts of co-creation are explored in relation to existing knowledge.

The thesis primarily aims to shed light on the motivations driving consumer and platform user engagement in co-creation environments, particularly within the context of SDL. These motivations are found to be multifaceted, with intrinsic factors like personal satisfaction and skill development often playing a significant role, especially in open-source communities where volunteers generously contribute their time and expertise.

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In addition to motivations, the study underscores the substantial benefits of firms engaging in open-source communities, including access to skilled and motivated contributors who drive innovation, design, and business development. Firms can also enhance their reputation and visibility, attract new partners and customers, and ultimately foster a sense of mutual benefit and shared purpose.

Moreover, the research recognizes the continuous exchange of information between firms and communities, leading to the growth of knowledge and information, which benefits all stakeholders. This reciprocity encourages greater participation and contribution, creating a more sustainable and successful co-creation ecosystem.

Furthermore, the study delves into the influence of key constructs like sense of community, platform identification, and innovativeness, all as antecedents and moderators, within co-creation environments. These factors significantly impact participation and experience in such settings, with a sense of community and platform identification being particularly motivating. Innovativeness also drives the generation of fresh ideas.

Beyond antecedents and moderators, the research highlights the direct effects of co-creation on economic and relationship value. Co-creation can result in tangible benefits, including increased revenue, cost reduction, and improved efficiency, as well as intangible advantages, such as the development of strong and enduring relationships between firms and customers.

The study investigates the indirect consequences of co-creation, revealing that it can lead to sustained engagement, positive word-of-mouth, and heightened satisfaction. This can drive continued innovation, brand awareness, customer loyalty, and revenue growth.

So, the research underscores the substantial benefits of co-creation environments for firms and consumers. Further detailed discussions in subsequent sections offer a deeper understanding of these benefits, contributing to the broader understanding of the value created through co-creation.

4.2.1 Co-Creation Experience and Co-Creation Participation

Result H1, which investigates the positive relationship between co-creation experience and co-creation participation, reveals a fundamental dynamic: co-creation experience plays a significant role in encouraging individuals to actively participate in this collaborative process, namely in the co-creation participation. This influence is multifaceted and can be explained in more detail.

Co-creation offers participants a unique opportunity to become emotionally involved with the products or services under development. When individuals contribute their ideas and efforts to creating something, they establish deep bonds with the project. These emotional connections can lead to a feeling of personal investment in the co-creation process. Furthermore, as participants become actively involved in co-creation, they experience a unique connection with the final output. Participants come to feel that they have a direct influence on the final output. Not only are they sharing their visions and knowledge, but they are also investing part of themselves in the creation of the product or service. This emotional connection is powerful, as it creates a sense of ownership, as if the project were an extension of their own identity. As a consequence, are more likely to dedicate themselves in a continuous and meaningful way.

Another important aspect is that co-creation gives participants a sense of accomplishment and importance. They become crucial parts of the co-creation process, recognizing that their contributions have a tangible and real impact. In addition, the co-creation experience can give participants a sense of empowerment. They realize that they

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have the power to actively shape the creation of products or services, which intensifies the emotional connection, as participants feel empowered and respected. The emotional connection that originates in the co-creation experience can generate a sense of ownership that lasts over time. As participants follow the development of the product or service in which they played an active role, they can feel a deep sense of pride in their contribution. This sense of appreciation and recognition further increases participants' motivation to get involved on an ongoing basis.

Furthermore, co-creation is not just limited to the final product or service; it encompasses the creation of a sense of belonging. Participants feel that they are part of the team or community that brought the idea to life. This sense of belonging is intrinsically rewarding and contributes to ongoing engagement. Individuals can cultivate a deep sense of gratitude for the opportunity provided and potentially result in the development of meaningful interpersonal relationships, further strengthening the lasting emotional connection between participants and firms, and positively influencing co-creation participation.

4.2.2 Co-Creation Antecedents and Moderators

The following topics look in detail at the impact of the three constructs that have been identified as precursors to co-creation, namely platform identification, sense of community, and innovativeness. The discussion focuses on analyzing the direct influence of each of these constructs on co-creation and explores the moderating effects they play in this process. Considering the results of the hypotheses investigated, the discussion delves deeper into understanding how platform identification, sense of community, and innovativeness play key roles in promoting and facilitating co-creation.

The sense of community plays a crucial role in co-creation, influencing both the co-creation experience and participation in this process. When people feel like they are part of a community, they have more positive co-creation experiences due to the promotion of values such as collaboration, mutual trust, and effective communication. This sense of unity inspires trust among participants, which is essential for the success of co-creation. Additionally, communities often have well-established communication channels, promoting effective collaboration and enriching co-creation experiences. Therefore, the sense of community creates a conducive environment for more positive co-creation experiences and encourages active participation.

Platform identification is also fundamental in co-creation. When customers establish a deep emotional connection with the co-creation platform, it has a positive impact on the co-creation experience and active participation. Those who strongly identify with the platform are more likely to have positive and productive co-creation experiences. This is because their emotional investment in the process motivates them to actively contribute ideas and insights. Furthermore, trust in the firm facilitating co-creation is strengthened, improving the quality and feasibility of co-creation results. Therefore, firms should prioritize the creation of co-creation platforms that promote this identification.

Finally, innovativeness plays a fundamental role in co-creation too. The ability to think innovatively influences collaboration, enhances the quality of co-creation experiences, and increases participants' adaptability to market changes. Those inclined toward innovation are more willing to explore new ideas and solutions during the co-creation process, enriching experiences and generating more creative results. Additionally, innovativeness acts as a moderator in the relationships between platform identification, sense of community, and co-creation experience, customizing the impact of these factors according to each participant's level of innovativeness.

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4.2.2.1 Sense of Community

The sense of community plays a crucial role in co-creation, influencing both the co-creation experience and co-creation participation, but also as moderator. Three research hypotheses have been explored in this context.

Hypothesis 2 suggest that the sense of community is positively related to the co-creation experience. This means that when individuals feel like they are part of a community, they tend to have more positive and enriching experiences with co-creation. This is because communities provide fertile ground for promoting essential values such as collaboration, mutual trust, and effective communication.

Within a community, members share common goals and values, naturally creating a conducive environment for co-creation. The sense of unity and shared identity inspires trust among participants, as they believe in each other's good intentions and contributions. This trust is essential to the success of co-creation, as participants need to believe that their contributions will be valued and respected. Furthermore, communities often have well-established communication channels and clear interaction norms, promoting effective communication and making it easier for members to collaborate, exchange ideas, and provide constructive feedback. This continuous exchange of information and insights within the community further enriches co-creation experiences.

Hence, by promoting values like collaboration and trust while providing an effective platform for communication, the sense of community enhances and improves the co-creation journey, making it more productive and rewarding for all involved.

Hypothesis 3 suggests that the sense of community is positively related to co-creation participation. This means that when individuals feel like they are part of a community, they are more likely to actively participate in co-creation activities. This is because the sense of community creates an environment that fosters trust, intrinsic motivation, a sense of belonging, and shared responsibility.

Trust is a fundamental pillar in this process. Community members trust that their contributions will be valued and respected by other participants, encouraging them to share their ideas, insights, and collaborate meaningfully. The sense of security that the community provides is a key element in promoting active participation.

Additionally, individuals who strongly identify with the community and its goals feel an intrinsic desire to contribute to the success of that community. This identification generates additional motivation for co-creation participation, as members want to play a significant role in advancing and growing the community to which, they belong.

The existence of participation norms within the community is also a critical factor. These norms establish clear expectations of engagement and create a sense of shared responsibility among members. The feeling that everyone has a responsibility to contribute drives co-creation participation.

Thus, the sense of community is a powerful catalyst that promotes greater co-creation participation. By strengthening trust, intrinsic motivation, a sense of belonging, and shared responsibility, it encourages community members to actively and meaningfully engage in co-creation initiatives. This engagement benefits both individuals and the community itself, creating a virtuous cycle of collaboration and mutual growth.

Hypothesis 4 suggests that the sense of community moderates the relationship between the co-creation experience and co-creation participation. This means that the strength of the relationship between these two variables depends on the level of sense of community within the community.

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When the sense of community is strong and cohesive, positive co-creation experiences are more likely to have a pronounced and positive impact on co-creation participation. This is because members feel more motivated and committed to co-creation when they are part of a united community. The sense of belonging to a cohesive group amplifies the positive influence of co-creation experiences, leading to greater participation and active involvement of members.

On the other hand, in scenarios with a low sense of community, the relationship between co-creation experience and participation may be weaker. Even when individuals have positive co-creation experiences, they may not be as motivated to contribute actively if they do not feel connected to the community in question. The lack of a strong connection with the community can dampen the impact of positive experiences on the decision to participate.

It is important to note that the sense of community not only moderates the relationship but also provides insight into how this relationship can vary. Furthermore, the intensity of the sense of community can act as a turning point. Below a certain threshold, the relationship between co-creation experience and participation may be tenuous or even negligible. As the sense of community strengthens, the impact of positive co-creation experiences on co-creation participation becomes more pronounced.

The hypothesis 4 emphasizes that the sense of community is a key component in the dynamics between co-creation experience and co-creation participation. It acts as a moderator that strengthens or weakens this relationship, depending on the level of cohesion and connection within the community. The role of this moderator is crucial for effective co-creation engagement strategies, especially when dealing with communities with varying levels of social cohesion.

To summarize, sense of community plays a pivotal role in the realm of co-creation, shaping both the co-creation experience and participation while also acting as a potent moderator of their interplay:

- Hypothesis 2 underscores how the sense of community fosters an environment ripe for collaboration, trust, and effective communication, thereby enhancing co-creation experiences. This sense of unity and shared identity nurtures trust among participants, enabling them to contribute with confidence and receive respect for their inputs. Moreover, it cultivates well-established communication channels and interaction norms that enrich the co-creation journey through continuous information exchange.
- Hypothesis 3 further illustrates that the sense of community significantly influences co-creation participation. The intrinsic motivation, trust, sense of belonging, and shared responsibility within a community incentivizes active engagement. Trust is a linchpin, as community members feel secure in sharing their ideas and insights. The strong identification with the community's goals kindles a desire to contribute, while participation norms create shared responsibilities. Consequently, the sense of community is a compelling catalyst for increased co-creation participation, fueling collaboration and mutual growth.
- Hypothesis 4 underscores how the sense of community moderates the relationship between co-creation experience and participation. In cohesive communities, positive co-creation experiences have a more pronounced impact on participation, driven by the motivation and commitment of united members. Conversely, in communities with a weaker sense of unity, the relationship between these variables may be less potent. The intensity of the sense of community acts as a pivotal

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turning point, with its strengthening amplifying the influence of positive experiences on participation.

Understanding the multifaceted role of the sense of community is imperative for devising effective co-creation engagement strategies, particularly when dealing with communities exhibiting varying levels of social cohesion. This insight not only enriches our understanding of co-creation dynamics but also empowers organizations to foster more vibrant and participative co-creation communities.

4.2.2.2 Platform Identification

Platform identification also plays a crucial role in co-creation, influencing both the co-creation experience and co-creation participation, but also moderating. Three research hypotheses have been explored in this context.

Hypothesis 5 explores the relationship between platform identification and co-creation experience, proposing a positive association. This hypothesis delves into a critical facet of co-creation, where platform identification plays a central role.

Platform identification, at its core, signifies the extent to which customers form a deep and emotional connection with the co-creation platform. This connection goes beyond mere utility; it encompasses a profound sense of ownership and a feeling of belonging. When customers strongly identify with a co-creation platform, it sets the stage for a cascade of positive outcomes.

The primary effect of robust platform identification is its influence on a customer's co-creation experience. Customers who deeply identify with a platform are notably more likely to have a positive and fulfilling co-creation experience. This stems from their emotional investment in the co-creation process, fueled by their sense of connection and commitment to the platform. They become motivated contributors, actively engaging, sharing valuable insights, and generating innovative ideas. In essence, platform identification serves as a catalyst, propelling customers toward enthusiastic and meaningful co-creation participation.

Furthermore, the impact of platform identification extends beyond individual customer experiences; it enriches the entire co-creation ecosystem. Customers with strong platform identification often develop heightened trust in the firm facilitating the co-creation process. This trust, rooted in their deep connection, forms the basis for more seamless and productive collaborations between the firm and its co-creation partners, whether they are other customers or the firm itself. This heightened level of collaboration not only amplifies the co-creation experience but also enhances the quality and feasibility of the co-created outcomes.

Hypothesis 6 explores the relationship between platform identification and co-creation participation, positing a positive correlation. This hypothesis uncovers a critical dimension of co-creation, where platform identification acts as a driving force behind active participation.

Platform identification, by definition, represents the extent to which customers establish a profound emotional connection with the co-creation platform. It surpasses mere utilization; it embodies a deep sense of ownership and belonging. When customers strongly identify with a co-creation platform, it sets the stage for increased co-creation participation.

The rationale behind this is clear: individuals who strongly identify with a platform are more inclined to actively engage in the co-creation process. This inclination arises from their emotional investment in the platform. They feel a deep connection and commitment to it, motivating them to become enthusiastic participants in co-creation endeavors. Their active involvement often translates into the generation of valuable insights, innovative ideas, and constructive feedback. Hence, it emphasizes the importance of creating co-creation platforms that customers can deeply identify with, fostering a sense of ownership and belonging.

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Furthermore, firms play a pivotal role in fostering and leveraging platform identification for enhanced co-creation participation. By customizing the co-creation approach and value proposition to align with the specific needs and preferences of key customer segments or personas, firms can optimize the co-creation experience.

The results of the investigation regarding hypothesis 7, which proposed that platform identification moderates the relationship between co-creation experience and co-creation participation, did not provide support for this hypothesis. Several reasons can be contributed to explain this lack of support.

This result may be attributed to the multifaceted and complex nature of platform identification, with its influence varying depending on the context and individual characteristics of users. Moreover, other factors may wield a more significant influence on co-creation participation than platform identification. For example, users' intrinsic motivation to actively participate in co-creation projects, the quality of social interactions within the platform, and the perception of personal value derived from participation could be critical factors influencing users' decisions to engage or abstain from co-creation activities. These factors may have overshadowed any moderating effect of platform identification. Furthermore, it is important to highlight that the demographic, cultural, and behavioral characteristics of this sample may have played a role in the lack of support for the moderation hypothesis. Therefore, generalizing these results to all situations of co-creation in digital environments should be approached with caution.

While the initial hypothesis suggested that platform identification would play a moderating role in the relationship between co-creation experience and co-creation participation, the findings of this study indicate that other factors may exert a more predominant influence in this dynamic. This lack of support underscores the complexity of interactions in digital environments and the necessity of considering a variety of factors to fully comprehend user behavior in digital co-creation.

To summarize, the exploration of hypotheses 5, 6, and 7 provides valuable insights into the intricate dynamics between platform identification, co-creation experience, and co-creation participation within the context of digital environments:

- Hypothesis 5 highlights the significance of platform identification in enhancing the co-creation experience. The findings underscore that when customers establish a deep emotional connection with a co-creation platform, it sets the stage for a cascade of positive outcomes. These outcomes benefit not only the individual customer but also enrich the entire co-creation ecosystem. By prioritizing the cultivation of co-creation platforms that foster strong customer identification, firms can create environments where customers actively contribute to their growth and success.
- Hypothesis 6 delves into the relationship between platform identification and co-creation participation, revealing a positive correlation. It becomes evident that individuals who strongly identify with a platform are more inclined to actively engage in co-creation efforts. This inclination arises from their emotional investment in the platform, motivating them to become enthusiastic participants in co-creation endeavors. The customization of the co-creation approach and value proposition to meet customer needs and preferences further optimizes the co-creation experience.
- However, the investigation into hypothesis 7 did not yield support for the idea that platform identification moderates the relationship between co-creation experience and co-creation participation. Several factors contributed to this lack of support,

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including the multifaceted nature of platform identification, the potential overshadowing of other influential factors, and the role of demographic, cultural, and behavioral characteristics.

In essence, these findings emphasize the intricate and multifaceted nature of digital co-creation dynamics. While platform identification plays a pivotal role in enhancing the co-creation experience and participation, it may not always serve as a moderator in this context. Understanding and optimizing digital co-creation require considering a broad spectrum of factors, including user motivations, social interactions, and perceived value.

These results underscore the importance of a holistic approach to understanding and fostering co-creation in digital environments. By recognizing the complexity of user behavior and the diversity of factors at play, development and design must facilitate co-creation processes that are meaningful and productive for all stakeholders.

4.2.2.3 Innovativeness

Innovativeness plays a crucial role in co-creation too, both as a direct antecedent and as moderator. Three research hypotheses have been explored in this context.

Hypothesis 8 embarks on an intriguing exploration, unveiling the positive relationship between innovativeness and the co-creation experience. This finding not only underscores the significance of innovativeness but also underscores its pivotal role within the realm of co-creation.

The capacity for innovativeness, when applied to co-creation, exerts a multitude of remarkable influences. Individuals with a propensity for innovativeness are more predisposed to collaborate and engage in co-creation with an open-minded approach to novel ideas. This predisposition sets the stage for a highly conducive environment for the conception of innovative solutions and the crafting of unique and distinctive experiences.

However, the influence of innovativeness extends beyond a mere inclination to collaborate. It tangibly manifests itself within the co-creation experiences. As innovative individuals apply their unique perspectives and skills during the co-creation process, it tends to significantly enhance the quality of the experiences that emerge from this collective endeavor. These enriched experiences, in turn, tend to elicit a deeper level of engagement from participants and foster a more positive reputation for the parties involved.

Thus, innovativeness emerges as a fundamental driving force within the co-creation experience. It not only facilitates collaboration among participants but also substantially elevates the quality of the resulting experiences. Furthermore, the capacity for innovativeness imparts an exceptional level of agility to individuals, rendering them more adaptable to the dynamic shifts of the market. Therefore, innovativeness undeniably stands as a key piece in the puzzle of successful co-creation, fueling creativity, quality, and adaptability at every stage of this collaborative process.

Hypothesis 9 delves into a captivating inquiry, unveiling the pivotal role of innovativeness as a critical moderator in shaping the interplay between platform identification and the co-creation experience. This hypothesis not only underscores the significance of innovativeness but also highlights its instrumental function within the realm of co-creation dynamics.

Innovativeness assumes a pivotal role as a moderating variable, exerting a substantial influence on both the intensity and character of the relationship between platform identification and the co-creation experience. Essentially, it reshapes the dynamics of how platform identification interfaces with co-creation, either amplifying its impact or diminishing it, contingent upon an individual's level of innovativeness.

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When an individual possesses a high degree of innovativeness, the connection between their platform identification and co-creation experience becomes strikingly more potent. Their innovative mindset functions as an amplification factor, magnifying the influence of their strong platform affiliation on the co-creation process. This alignment creates fertile ground for the generation of groundbreaking ideas and creative contributions, significantly enhancing the overall co-creation experience.

Conversely, for individuals with lower levels of innovativeness, the link between platform identification and co-creation experience may display diminished strength. In such scenarios, their limited innovativeness acts as a mitigating factor, tempering the impact of their platform identity. While their connection to the platform remains robust, its translation into co-creation often follows a more conventional and less innovative path.

The moderating effect of innovativeness essentially customizes the impact of platform identification, acknowledging that not all users perceive co-creation in the same manner, even within tightly-knit platform communities. By considering an individual's innovativeness, platform designers and organizations can tailor their strategies to accommodate diverse user profiles. This tailored approach optimizes the co-creation experience by capitalizing on each user's unique innovative potential.

Innovativeness serves as a critical filter that shapes the interplay between platform identification and the co-creation experience. It accentuates the transformative potential of strong platform identification for highly innovative individuals while recognizing that for those with lower innovativeness, the impact may assume a more conventional form. This understanding empowers platform creators to harness the strengths and proclivities of their users, fostering a more dynamic and value-rich co-creation ecosystem.

Similarly, hypothesis 10 addresses an intriguing question, highlighting the crucial importance of innovativeness as an essential moderating factor in the relationship between the sense of community and the co-creation experience. Innovativeness plays a remarkable role as a moderating effect in the complex relationship between the sense of community and the co-creation experience. This implies that the impact of the sense of community on the co-creation experience varies depending on the prevailing level of innovativeness within the community or group.

Sense of community creates an environment conducive to innovative thinking, so that when community members possess a high level of innovativeness and at the same time feel strongly connected and trust each other, they are more likely to take risks, experiment with new approaches, and collaborate openly. This collaborative spirit, fueled by shared values and a sense of unity, serves as fertile ground for positive co-creation experiences. Thus, in this scenario, innovativeness amplifies the impact of the sense of community, elevating co-creation to new levels of ingenuity and originality and improving the overall co-creation experience.

Conversely, for individuals with lower levels of innovativeness, the link between platform identification and co-creation experience may display diminished strength. In such scenarios, their limited innovativeness acts as a mitigating factor, tempering the impact of their platform identity. While their connection to the platform remains robust, its translation into co-creation often follows a more conventional and less innovative path.

Conversely, for individuals less prone to innovation, where the spirit of experimentation and the pursuit of new ideas may be less pronounced, the impact of a strong sense of community on co-creation experiences may be less evident. In this context, the sense of community provides a supportive backdrop but may not generate the same positive experience out of the co-creation endeavor.

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In conclusion, innovativeness plays a multifaceted and crucial role, functioning not only as an influencer but also as a moderator:

- Hypothesis 8 uncovers a positive relationship between innovativeness (the capacity for innovative thinking) and the co-creation experience. This highlights the pivotal role of innovativeness in fostering collaboration, open-mindedness, and innovative solutions, ultimately elevating the quality of co-creation experiences.
- Hypothesis 9 delves into the dynamic between platform identification and the co-creation experience, emphasizing innovativeness as a critical moderator. Highly innovative individuals experience a stronger connection between platform identity and co-creation, leading to groundbreaking ideas. Conversely, less innovative individuals may experience a more conventional co-creation approach, underscoring the personalized impact of innovativeness.
- Hypothesis 10 explores the relationship between the sense of community and co-creation experience, emphasizing the role of innovativeness as a moderator. Innovativeness enhances the co-creation experience when community members are open to creative exploration, creating a dynamic co-creation environment. However, for less innovative individuals, the impact of a strong sense of community on their co-creation experience may be less pronounced, highlighting the influence of innovativeness.

These findings collectively highlight the significance of innovativeness in co-creation, shaping collaboration, enriching experiences, and customizing the impact of various factors, ultimately fostering a dynamic and value-rich co-creation ecosystem.

4.2.3 Co-Creation Consequences

The following topics delve into the detailed impact of co-creation on its outcomes. The discussion focuses on analyzing the direct influence of co-creation on relational value and economic value, with the indirect influence of co-creation on satisfaction, future participation, and word-of-mouth. This will collectively highlight the significant influence of active participation in co-creation activities and the multifaceted value it generates.

Therefore, the co-creation experience contributes to economic value, going beyond merely transactional interactions. Participants actively involved in shaping their experiences develop a strong sense of connection and ownership. This results in the various ways participants perceive and shape economic value, from cost savings to personal satisfaction.

It then deepens the role of the co-creation experience in promoting relational value. Through collaboration and shared understanding, participants build trust, collaboration and forge lasting relationships that go beyond purely transactional benefits, contributing to unwavering loyalty.

Next, the importance of economic value as a precursor of satisfaction is highlighted, emphasizing that participants derive satisfaction when they perceive substantial benefits relative to their investment. This perception of economic value not only drives satisfaction but also influences the perception of product or service quality, serving as a boost for long-term engagement and loyalty.

At the same time, the results also emphasize the value of solid relationships built on trust, commitment, and mutual understanding, indicating that participants experience greater satisfaction when they perceive a high level of relational value. Such strong relational bonds lead to lasting loyalty and the ability to overcome minor setbacks, promoting continued engagement.

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Additionally, the crucial role of satisfaction in catalyzing positive word-of-mouth communication among participants is highlighted. Satisfied participants become advocates for the products, services, or communities they engage with, resulting in increased brand recognition and market participation. There is also the establishment of a crucial link between satisfaction and future participation, emphasizing that satisfied participants are more likely to engage in future co-creation initiatives.

4.2.3.1 Economic Value and Relational Value

Hypothesis 11a investigates the co-creation experience is positively related to economic value, a rich and multifaceted concept. When individuals actively engage in co-creation activities, they are not merely interacting with products or services; they are involved in a process that triggers a series of profound benefits.

By allowing people to take an active role in creating or adapting a product or service, they develop a deep sense of connection and ownership. This not only strengthens the emotional bond with the product or service but also enhances the perception of value. Participants tend to value more what they have actively shaped according to their own needs and preferences. At this point, economic value can take on various forms, ranging from saving time and money to achieving personal goals. Therefore, the quality of the co-creation experience plays a fundamental role in how participants perceive and experience economic value, considering that this value can be both tangible and subjective.

Therefore, the co-creation experience allows for the creation of tangible or subjective economic value, depending on how individuals determine value. When participants could customize products or services to meet specific needs, value can become highly subjective. However, it is the value that resides in the ability to meet individual desires and expectations, determined by everyone, and it can vary from person to person.

Consequently, the co-creation experience reveals itself as a dual source of value: emotional and financial, depending on each person's perspective. Active collaboration not only strengthens relational bonds but also facilitates the creation of economic value, whether it is perceived concretely or based on personal experiences. This unique dynamic makes the co-creation experience an enriching journey that empowers individuals not only to become more loyal to products and services but also to recognize the benefits, whether they are measurable in financial terms or based on personal fulfillment.

Hypothesis 11b explores the positive relationship between co-creation participation and economic value. When participants actively engage in co-creation, it positively influences how they assess the economic value of the experience. This dynamic occurs because co-creation participation allows people to genuinely feel involved and valued in their contributions, resulting in a deep emotional connection.

This emotional connection can manifest in various ways. For instance, participants may perceive that their activities, ideas, and suggestions are taken seriously, which, in turn, can lead to products or services that better meet their needs and desires. Furthermore, the sense of active collaboration and being part of the creation process can generate profound satisfaction and a sense of belonging.

It is crucial to emphasize that the economic value of co-creation, although not always quantifiable in measurable financial terms, plays a vital role in the emotional aspect. When participants recognize that their contributions are intrinsically linked to emotional benefits, such as personal satisfaction, a sense of achievement, and belonging to a community of co-creators, it establishes a deep connection and drives loyalty to the experience.

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Thus, the interconnection between active co-creation participation and economic value goes beyond purely financial analysis. It encompasses the subjective and emotional dimension of the participant's experience. When someone perceives that their contributions not only have a tangible impact but also enrich their life emotionally, it results in a more meaningful and enduring bond with the co-creation process.

So, economic value is positively and directly influenced by the participant through co-creation participation. Objective benefits are clearly measurable. On the other hand, the inherent subjectivity of economic value reflects the benefits that participants derive from their experiences, which can be measured in various ways, such as time savings, convenience, improved quality of life, or the satisfaction of having a personalized product or service.

Hypothesis 12a investigates the positive relationship between the co-creation experience and relational value. The co-creation experience plays a pivotal role in fostering relational value, as it engenders a dynamic synergy among participants. When participants engage in co-creation activities, they collectively cultivate a profound comprehension of the product or service under development. This shared understanding serves to diminish uncertainty and vulnerabilities within the collaborative process, fostering an environment conducive to innovation and mutual growth.

Through collaborative endeavors, participants not only forge a sense of trust in each other's competencies and expertise but also nurture an overall atmosphere of heightened trustworthiness. This augmented trust permeates interactions, conversations, and attitudes, thereby contributing to an elevated level of trustworthiness overall. Participants who have cultivated trust in one another and the collaborative endeavor are more inclined to perceive a heightened sense of relational value.

In this context, relational value transcends the mere transactional benefits of products or services. Instead, it encapsulates the multifaceted advantages stemming from the enduring relationship among participants and the collaborative initiative itself. Co-creation entails deep levels of engagement and mutual collaboration between stakeholders, compelling entities involved to remain current and adapt to sustain and expand these relationships.

These relationships can naturally progress into continued collaborations, providing mutual support and benefits that extend well beyond the completion of the co-creation project. This enduring collaboration bestows significant value upon participants, offering a lasting legacy of advantages that reaches far beyond the immediate scope of the project. As a result, the co-creation experience fosters trust not only among the participants themselves but also within the collaborative initiative as a unified entity. This, in turn, leads to elevated levels of satisfaction and cultivates unwavering loyalty among those actively engaged in this collaborative journey.

Hypothesis 12b suggests that there exists a positive relationship between co-creation participation and relational value. This means that an increase in co-creation participation is expected to result in an increase in the perceived relational value within the context of the study.

Co-creation participation involves continuous interaction and collaboration among participants. Through ongoing communication, collaboration, and trust-building, participants naturally establish and nurture relationships among themselves. These relationships evolve as participants work together towards shared goals, enhancing relational value over time.

Trust forms the foundation of strong relationships, and co-creation participation provides fertile ground for trust to develop. Participants in co-creation activities learn to rely on each other's expertise and contributions, strengthening the bonds of trust. This enhanced trust is a fundamental component of improved relational value.

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What underscores the relational value is that it arises from the quality of relationships formed during co-creation, extending beyond transactional aspects. Participants perceive value not only in immediate outcomes but also in ongoing connections and support they receive through these relationships.

Co-creation often involves multiple participants interacting with each other and with the facilitating entity, intricately weaving a web of interactions that enhances their integration. Properly integrated participants are more likely to recognize the importance of building solid relationships to foster lasting partnerships characterized by high relational value.

As participants immerse themselves in co-creation activities and forge bonds with each other and the facilitating entity, they gain a deep understanding of the intrinsic relevance of collaboration and partnership. These insights motivate them to seek stronger and longer-lasting alliances, giving rise to the forging of connections that result in substantial relational value.

Through co-creation, participants not only witness the benefits of collaboration but also internalize these lessons, recognizing the synergy and positive outcomes that arise when multiple parties join forces. This appreciation sharpens their pursuit of deeper and more solid relationships, where trust, effective communication, and cooperation become cornerstones.

This quest for stronger, long-term partnerships not only amplifies immediate relational value but also lays a solid foundation for enduring and mutually beneficial relationships. As participants invest time and effort in building these strong connections, they reap the rewards of relational value not only in the present but also over time, as these relationships strengthen and evolve. Therefore, co-creation is not just a vehicle for creating immediate relational value but also a platform for nurturing enduring and thriving relationships.

Participation in co-creation is positively related to relational value because it serves as a catalyst for the development of relationships based on trust, collaboration, and ongoing communication. These relationships are instrumental in creating a rich reservoir of relational value that extends well beyond the immediate co-creation project. As participants build connections with each other and the facilitating entity, they experience greater satisfaction and loyalty, making the positive relationship between co-creation participation and relational value undeniable.

In conclusion, the hypotheses explored in this comprehensive analysis reveal the intricate and interconnected nature of co-creation, economic value, and relational value:

- Hypothesis 11a illuminates the relationship between the co-creation experience and economic value, emphasizing that co-creation goes beyond transactional interactions with products or services. Participants that experience greater autonomy, competence and enjoyment during co-creation develop a strong sense of connection and ownership, ultimately enhancing both emotional and economic value. This dual-source of value reflects the diverse ways participants perceive and shape economic benefits, from cost savings to personal fulfillment.
- Hypothesis 11b builds on this foundation by exploring the positive link between co-creation participation and economic value. It emphasizes that greater participation results in products or services that better meet the participants' needs as well as greater personal satisfaction, ultimately leading to perceptions of economic value. This connection fosters loyalty and ongoing engagement, highlighting the holistic nature of economic value within co-creation.
- Hypothesis 12a delves into the co-creation experience's role in fostering relational value. A better co-creation experience helps build trust and forge enduring relationships. These relationships extend well beyond transactional benefits,

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encompassing a myriad of advantages that contribute to heightened satisfaction and unwavering loyalty.

- Hypothesis 12b reinforces the positive relationship between co-creation participation and relational value. It underscores that active engagement fosters trust, collaboration, and enduring relationships, ultimately leading to increased satisfaction and loyalty among participants.

The hypotheses collectively highlight how co-creation serves as a dynamic and enriching journey. Participants not only perceive value but actively shape it, contributing to emotional and financial well-being. These findings emphasize the importance of recognizing the holistic nature of co-creation, where participants actively contribute to and benefit from both economic and relational value.

4.2.3.2 Satisfaction, Word-of-Mouth, and Future Participation

Hypothesis 13, which posits that economic value is positively related to satisfaction, because participants in co-creation environments understand economic value as the benefits they receive from engaging with a particular product or service, based on the amount they are willing to pay for it or the level of involvement they are willing to participate in activities in co-creation environments related to it. When participants perceive that they are receiving a high level of economic value from a product or service, they are more likely to be satisfied with their participation. This is because participants feel that they are getting a good "deal" and that the benefits they receive are worth the "cost". Conversely, when participants feel that they are receiving a low level of economic value, they are more likely to be dissatisfied with their participation. This is because participants feel that they are not getting a good level of satisfaction and that the benefits they are receiving are not worth the involvement. Therefore, the higher the perceived economic value, the greater the participant's level of satisfaction.

In addition, the positive relationship between economic value and satisfaction is that participants may perceive a higher level of quality in products or services that provide a high level of economic value. When participants perceive that they are receiving a high level of economic value, they may also perceive that the product or service is of higher quality, since they are getting more benefits. This perception of higher quality can lead to higher levels of participant satisfaction, since participants are more likely to be satisfied with products or services that they consider to be of higher quality. Conversely, when participants consider that they are receiving a low level of economic value, they may also consider the product or service to be of lower quality, since they are getting fewer benefits for the same cost. This perception of lower quality can lead to lower levels of customer satisfaction, since customers are less likely to be satisfied with products or services that they consider to be of lower quality.

Thus, the positive relationship between economic value and satisfaction can be explained by the fact that participants are more satisfied with their participation when they perceive that they are receiving a high level of benefits, which is reflected in their perception of economic value. In addition, participants in co-creation environments may perceive a higher level of quality in products or services that provide a high level of economic value, which can also lead to higher levels of satisfaction.

Hypothesis 14 posits that relational value is positively related to satisfaction. The positive relationship between relational value and satisfaction can be elucidated by several key factors. Firstly, participants see relational value as the benefits they get from fostering a solid relationship with a specific entity or with other participants in co-creation environments, based on trust, commitment and mutual understanding. When participants perceive a high

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level of relational value, they are more likely to feel satisfaction with their involvement. This is mainly because participants feel are dedicated to meeting their needs and providing a rewarding experience. Conversely, when participants perceive a low level of relational value, they are more likely to feel dissatisfied in their interactions. This result from the belief that they are not committed to meeting their needs and ensuring a positive experience. Thus, higher perceived relational value is correlated with higher levels of participant satisfaction.

Also, participants in co-creation environments may have a higher tolerance for service interruptions or adjustments when they have established a strong relationship. When participants maintain a high level of relational value, they are more inclined to ignore minor service problems and remain loyal. This stems from the conviction that they prioritize their interests and remain committed to providing a positive experience, even in the face of occasional setbacks. Conversely, when participants have a low level of relational value, they are more inclined to change when they encounter service interruptions. This tendency results from the perception that they are unable to satisfy their needs and have a positive experience, leading to a lower willingness to forgive small lapses. Thus, the positive correlation between relational value and satisfaction can also be attributed to participants' greater predisposition to forgive service interruptions when they have a strong relationship with a specific entity.

Additionally, participants may perceive a higher level of quality in the products or services provided with which they share a solid relationship. When participants enjoy a high level of relational value with an entity, they may also discern that the products or services offered are of a higher quality. This perception of superior quality can result in higher levels of satisfaction among participants, since they are more likely to consider that the products or services correspond to their needs and preferences. This perception of higher quality can further reinforce the positive relationship between relational value and satisfaction, since participants are more inclined to communicate their satisfaction when they perceive that the products or services they receive are of higher quality and adequately meet their expectations.

Hypothesis 15 posits that satisfaction is positively related to word-of-mouth because satisfied participants of co-creation environment are more likely to recommend the product or service to others, which can lead to increased brand awareness and market share. Participants of co-creation environment become the firm's spokespeople, and consequently, there is greater market penetration, removal of commercial barriers (elimination of suspicions that may exist in potential participants), increased loyalty, and creation of beliefs that lead potential participants to get involved in the community in which evangelists are included. On the other hand, dissatisfied participants of co-creation environment are more likely to switch to a competitor or share negative feedback about the experience. This can result in a negative impact on the firm's reputation or community and market share, as well as decreased participant retention and profitability.

Therefore, satisfaction is positively related to positive word-of-mouth, as satisfied participants of co-creation environment are more likely to share their positive experience with others. This positive word-of-mouth communication can lead to increased business, while negative word-of-mouth communication can lead to lost business and damage to the firm's or community reputation. Word-of-mouth communication is particularly important, where social media platforms and online review sites provide a powerful platform for participants to share their experiences with others. Since positive word-of-mouth can act as a powerful marketing tool for co-creation initiatives, as it can generate interest and excitement in potential participants and stakeholders, firms must focus on increasing the likelihood of positive word-of-mouth communication.

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Hypothesis 16 posits that satisfaction is positively related to future participation in co-creation environments. This means that when participants of co-creation environments are satisfied with their experience, they are more likely to engage in future co-creation initiatives proposed by the firm or by the communities in which they are inserted. Future participation refers to the intention of the participants or customers to collaborate again in the future in consumption experiences proposed by the firms or by the communities in which they are inserted. In other words, future participation refers to the likelihood or willingness of an individual to engage or participate in a particular activity or event in the future.

The positive relationship between satisfaction and future participation can be explained by several factors. Firstly, satisfied participants are more likely to develop a long-term relationship with the initiative, thereby creating a sustainable ecosystem of co-creation. On the one hand, this means that participants can spend more time involved in co-creation. On the other hand, participants who are not satisfied with a firm's products or services may need to be convinced to continue doing business with the firm or the community. They may require additional incentives or reassurances to overcome their negative perceptions and regain confidence in the firm's or community's offerings. Therefore, satisfaction can have a significant impact on future participation. This willingness to participate in the context of a co-creation environment can be an asset for the firm the community, as it can help them to gather important feedback and insights from their participants. This can help the firm to better understand their participants' needs and preferences, and to develop new products and services that meet those needs.

Secondly, satisfied participants may feel a sense of empowerment and ownership over the co-creation process. When participants are satisfied with their experience, they may feel a sense of pride and accomplishment in their contribution to the development of new products and services. This can lead to increased motivation and willingness to participate in future co-creation initiatives, as participants feel that their input is valued and appreciated. Additionally, satisfied participants may develop a sense of loyalty towards the firm or community and a desire to continue collaborating with the firm or community in the future.

Overall, the positive relationship between satisfaction and future participation in co-creation environments is an important finding that can help firms and communities to develop and implement more effective co-creation initiatives. By creating co-creation environments that are designed to maximize satisfaction, firms and communities can encourage participants to continue contributing to the development of new products and services, which can lead to increased innovation and value creation for all stakeholders involved.

These findings underscore the pivotal role of satisfaction, economic value, relational value, and positive word-of-mouth in shaping the success and sustainability of co-creation initiative:

- Hypothesis 13 highlights the significance of economic value in relation to satisfaction. Participants in co-creation environments derive satisfaction when they perceive that they are receiving substantial benefits relative to their investment, whether in terms of time, effort, or cost. This perception of economic value may also influences their perception of product or service quality which will boosts satisfaction. The positive correlation between economic value and satisfaction serves as a crucial driver for long-term engagement and loyalty in co-creation environments.
- Hypothesis 14 delves into the role of relational value, emphasizing that participants in co-creation environments value strong relationships built on trust,

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commitment, and mutual understanding. This strong relationship also influences the participants' tolerance for service issues and their perception of product or service quality. In other words, such strong relational bonds can lead to the potential to overlook minor setbacks, fostering continued engagement. Thus, when participants experience a high level of relational value, their satisfaction with the engagement increases significantly.

- Hypothesis 15 underscores the pivotal role of satisfaction in catalyzing positive word-of-mouth communication among participants in co-creation environments. Satisfied participants become advocates for the products, services, or communities they engage with, leading to increased brand awareness and market share. Conversely, dissatisfaction can have a detrimental effect, potentially driving participants away and harming reputation and profitability. The power of word-of-mouth communication, amplified by social media and online reviews, cannot be understated in the context of co-creation. Positive word-of-mouth generated by satisfied participants can attract new contributors, enriching the co-creation ecosystem.
- Hypothesis 16 establishes a crucial link between satisfaction and future participation. Satisfied participants are not only more likely to engage in future co-creation initiatives but also become invaluable assets for firms and communities seeking continuous feedback and innovation. Their satisfaction fosters a sense of empowerment and ownership, driving motivation and loyalty.

These hypotheses collectively illuminate the intricate interplay of satisfaction, economic value, relational value, and positive word-of-mouth in the realm of co-creation environments. Understanding and harnessing these relationships can empower firms and communities to design more effective co-creation initiatives, fostering innovation, loyalty, and value creation for all involved stakeholders.

4.3 CONTRIBUTIONS

Investigating the antecedents and consequences of co-creation is fundamental to filling a significant gap in understanding the dynamics of this collaborative process between consumers and firms, especially within the online environment. The gap identify in Oertzen et al. (2018) underscores the importance of such research in shaping and enhancing the creation of standout services. As the digital landscape continues to evolve, the online realm has become a pivotal arena for co-creation, offering unparalleled opportunities for innovation and value co-creation. Therefore, delving deeper into the intricacies of co-creation within online environments not only contributes to academic knowledge but also empowers businesses to harness the full potential of this collaborative approach in delivering exceptional services that resonate with consumers and drive sustained success.

The study by Yang et al. (2021) has already highlighted an important gap in the literature by emphasizing the participation of consumers in the initial phase of co-creation. However, this research makes it clear that there is a pressing need to analyze the role of the consumer in other phases of the co-creation process, which justifies further research.

One of the reasons for investigating the antecedents is to better understand the factors that drive co-creation. Identifying which elements motivate people to become actively involved in this process can provide valuable insights. In addition, investigating the outcomes of co-creation is equally crucial. Understanding the results and impacts of co-creation can help assess the value of this collaborative process. This includes analyzing the benefits perceived by consumers, such as greater satisfaction and emotional involvement.

The main finding of the study, encapsulated in hypothesis 1, highlights a strong correlation between the experience and active participation in the co-creation process. Significantly, the co-creation experience plays a fundamental role not only in stimulating but also in enriching active involvement. It achieves this by nurturing emotional involvement, establishing a deep connection with the end result, instilling a sense of accomplishment and meaning, fostering lasting emotional bonds and cultivating a sense of empowerment among participants. These multifaceted elements collectively contribute to an increased and unwavering commitment to the co-creation effort. This fits in with the gap identified in Gummerus (2013), in which he emphasizes the imperative need to understand the role of experiences and the common denominators that underpin the process and outcome of value creation.

Based on the relevance of the co-creation experience, to achieve success, co-creation endeavors need to build relationships and trust by establishing strong relationships with participants based on trust and transparency. This will help in clear communication about how participants' input will be used and in demonstrating how it has influenced past innovations. Furthermore, it is essential to provide tools and resources, such as user-friendly online ideation platforms or design thinking workshops, that facilitate co-creation and ensure that participants have the necessary resources and information to participate effectively. It is also crucial to recognize and reward participants for their contributions, whether through recognition, incentives, or loyalty programs, so that they feel valued and appreciated for their involvement.

Moreover, the results show that the co-creation experience goes further, establishing a deep connection with the result of the co-creation process. Because its effects extend indirectly across all the activities and outcomes of co-creation. The co-creation instills an emotional role that brings a deep sense of accomplishment and meaning to those who actively participate that not only creates a lasting emotional connection, but also cultivates a sense of empowerment among those involved. These multifaceted elements collectively contribute to a growing and unwavering commitment to the co-creation effort, resulting in a more effective and valuable process. Therefore, when considering the gap identified in Gummerus (2013), it is clear that the co-creation experience is not just a peripheral component, but a critical factor that underpins the process and outcome of value creation.

The gap identified in Mathis et al. (2016) highlights the need to expand the concept of the co-creation experience. Considering the study conducted, it can be understood that the co-creation experience is also a multifaceted and dynamic strategy that transcends the simple company-customer relationship. Primarily, it promotes genuine and active collaboration among the parties involved, catalyzing innovation, strengthening customer trust, and solidifying the identity of the stakeholders.

Additionally, in the gap identified in Moghadamzadeh et al. (2020), the importance of exploring the impact of different aspects of social co-creation on the delivery of innovative services is emphasized, going beyond the traditional approach that considers it solely as a moderating variable.

Social co-creation, as a social aspect, is a collaborative process in which participants actively engage in the design, development, or enhancement of services. To fully comprehend social co-creation, it is necessary to break it down into various components or dimensions. This breakdown may include factors such as participant engagement, feedback mechanisms, co-creation processes, and more.

It is essential to highlight that social co-creation is often approached in studies as a moderating variable, playing a role as an indirect influencer in the relationships between other

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variables. While this perspective is valuable and provides important insights into how collaboration can affect service performance and effectiveness, it is crucial to recognize that social co-creation goes beyond this moderating function.

The key point is the understanding of social co-creation and acknowledging it as an active and catalyzing element in the innovation of service delivery. Instead of merely being a variable that moderates or influences other variables, social co-creation can be seen as a driving force.

When social co-creation is viewed as a driving force, it can be regarded as an agent of change that surpasses conventional expectations. It not only shapes or influences the relationships between existing variables but also redefines the nature of the services themselves. This is because social co-creation involves the active and direct collaboration of multiple stakeholders.

In the results of the hypotheses of this study, one can observe clear evidence of how social co-creation impacts relevant outcomes. Social co-creation is not just a facilitator but a transformative force that challenges the traditional idea that innovation is solely driven by internal research and development teams. Instead, it highlights the importance of collaborating with those who use and value the services, capitalizing on their perspectives, experiences, and knowledge.

In this sense, social co-creation should be a path to creating shared value, where organizations and their partners come together on a journey of discovery, exploration, and innovation. This will reflect the collective wisdom and creativity that emerges when people become active partners in seeking solutions that enhance their lives and meet their ever-evolving needs.

The identified gaps at Priharsari and Abedin (2021), Frasquet-Deltoro et al. (2018), Roberts et al. (2014) and Dong et al. (2014) underline the imperative to delve deeper into the antecedents of consumer participation. They also highlight the need for empirical research covering various forms of value co-creation to improve understanding of the motivations of participants in co-creation environments. Furthermore, these gaps draw attention to the importance of investigating the factors that influence co-creation behaviors.

Recognizing the central role of sense of community as a catalyst for participation in communities and as an antecedent to co-creation, the results show that when individuals feel that they are members of a community, their co-creation experiences become significantly more favorable and enriching.

Collaboration within communities influences behavior and is fundamental to the success of co-creation activities. An important and highly relevant factor is mutual trust, which is a critical element for successful co-creation. It should be noted that mutual trust is facilitated by a sense of community and contributes to people's predisposition to participate. On the other hand, effective communication is another critical factor that is established through clear interaction channels and norms in communities. Effective communication is therefore essential for the exchange of knowledge and ideas between participants, which in turn improves co-creation experiences.

Thus, sense of community is the main factor that influences co-creation behaviors in online contexts and positively impacts people's pre-disposition to participate in co-creation activities. This results from the natural cultivation of values such as collaboration, mutual trust and effective communication within communities, making co-creation more productive and rewarding for all participants involved. In communities, shared goals and values create an environment conducive to co-creation. The resulting sense of unity and shared identity fosters trust among participants, a fundamental aspect for the success of co-creation efforts. In

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addition, communities often establish clear communication channels and norms of interaction, which facilitate effective collaboration and the exchange of knowledge and, consequently, improve co-creation experiences.

To better understand how people engage in stages preceding the initial phase of co-creation, the concept of sense of community was also investigated as a factor influencing participation in co-creation. This investigation led to the development of hypothesis 3, which made significant contributions.

Trust, a sense of belonging, and shared responsibility within a community are factors that encourage individuals to actively engage in activities. In this context, these characteristics refer to active participation by community members in a co-creation process where multiple individuals collaborate to create something together.

Trust plays a crucial role by creating an environment in which community members feel secure in sharing their ideas and insights. When individuals strongly identify with the community's goals, it motivates them to desire to contribute to achieving those goals. Additionally, participation norms establish clear expectations for how members should engage and collaborate, leading to shared responsibilities.

As a result of all these factors, the sense of community acts as a powerful driver of co-creation participation. This means that when individuals feel part of a cohesive community, they are more willing to collaborate and work together to achieve common goals. This collaboration benefits both the community and its members, promoting mutual growth and the effective and meaningful attainment of co-creation objectives.

The results of Hypothesis 4 highlight the importance of sense of community as a moderating factor in the relationship between co-creation experience and co-creation participation. This phenomenon occurs because the sense of community has the power to influence and strengthen the bonds among participants, thereby amplifying the impacts of co-creation.

Sense of community not only serves to amplify the positive effects of the co-creation experience but also plays an additional crucial role. It acts as a mitigator of negative experiences that participants may encounter during the process. This is due to the predisposition of community members to offer help, guidance, and encouragement when their peers face challenges. Furthermore, the community provides valuable emotional support and motivation for participants to persist and remain engaged in co-creation activities.

The ability of sense of community to promote resilience is a critical element. It allows participants to face obstacles and disappointments in co-creation activities in a more resilient manner. This resilience is essential for overcoming setbacks and ensuring the continuity of participation, as participants have the security of belonging to a supportive network. This underscores the importance of sense of community as a fundamental element in promoting successful collaborative interactions and supporting participants along their co-creation journeys.

The research gap highlighted in Brodie et al. (2013) underscores the significance of development platforms as foundational settings where collaboration and co-creation of value come to life. These platforms are not mere locations where interactions take place; rather, they are dynamic spaces that play a pivotal role in shaping participants' experiences. They form the bedrock upon which collaboration is built, and understanding their impact is crucial for enhancing the effectiveness of co-creation.

The results of Hypothesis 5 shed essential light on the intricate relationship between the quality of the co-creation experience and participants' identification with the platform. This

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discovery goes beyond mere findings; it reveals a profound understanding of the interplay between the participants experience and the environment in which this experience unfolds.

The evidence provided by this hypothesis highlights that the quality of the co-creation experience is intrinsically linked to the extent to which participants feel connected and engaged with the co-creation platform. The stronger participants identify with the platform, the more enriching their co-creation experience becomes. This interconnection underscores the platform's importance, as it is not merely a passive means for collaboration but an active and influential asset that shapes how participants perceive and experience co-creation. The platform is much more than a stage where interactions occur; it is a fundamental part of the experience, significantly contributing to participants' satisfaction and perceived value throughout the co-creation process.

According to this discovery, the platform is not a passive bystander to co-creation efforts. Instead, it is an active agent that plays a critical role in creating co-creation experiences that are not only satisfying but also meaningful. Participants' positive experience and the value they perceive in co-creation are directly influenced by the platform. When participants feel deeply connected and immersed in the platform, it amplifies the quality of the experience, making it more rewarding and effective.

Therefore, this hypothesis reveals that the platform should not be underestimated. It is not just an environment where co-creation takes place; it is an integral and active part of the co-creation experience. As such, the platform should be strategically designed and managed to optimize participants' experience quality. The holistic impact of the platform on co-creation goes beyond interactions and idea-sharing; it extends to how employees feel, engage, and perceive the value of their contributions.

This discovery also underscores the importance of adopting a participant-centered approach in managing co-creation platforms. Understanding and addressing participants' emotional and practical needs within the platform can have a significant impact on the quality of the co-creation experience and, by extension, the overall effectiveness of value co-creation. Therefore, the platform is not just a digital or physical infrastructure; it is a crucial facilitator of meaningful and successful co-creation experiences.

Hypothesis 6 takes us on a deeper exploration of the connection between platform identification and the level of active participation by participants in co-creation. The results of this hypothesis are particularly revealing as they highlight the comprehensive influence of platform identification on collaborative interactions and contributions by participants.

Hypothesis 6 reveals that the more participants identify with the co-creation platform, the higher the likelihood that they will actively and enthusiastically engage in the co-creation process. This finding has deep roots in behavioral psychology, as platform identification serves as a trigger for participants' intrinsic motivation. Instead of participating passively, participants driven by intrinsic motivation become active agents who contribute proactively and authentically.

Furthermore, platform identification is closely related to participants' sense of belonging to the co-creation community. When participants strongly identify with the platform, they naturally feel integral to the community, fostering a sense of belonging. This sense of belonging inspires them to become active and committed members of this community. They do not view co-creation as an isolated task but as an opportunity to contribute to the collective good. This long-term commitment creates a solid foundation for enduring collaborative relationships.

Platform identification also plays a crucial role in promoting the exchange of constructive feedback and the sharing of innovative ideas. Participants who identify with the platform tend

to feel more comfortable expressing their opinions, knowing that their contributions are valued and welcomed. This creates a conducive environment for innovation, where ideas can flow freely and be refined based on mutual feedback.

As a result, platform identification emerges as a key element driving active participation in co-creation. This active participation is not merely a tangible contribution; it is a factor that shapes the dynamics of collaboration as a whole. Participants who strongly identify with the platform are more than just contributors; they become catalysts for innovation, promoters of community cohesion, and agents of positive change. Therefore, understanding and nurturing platform identification are essential for creating productive and successful co-creation environments.

Hypothesis 7 takes us deeper into the role of platform identification and its potential function as a moderator in the relationship between the co-creation experience and participation. However, the results of this hypothesis offer an enlightening perspective that platform identification does not act as a moderator in this complex relationship. Instead, they point to an intriguing and fundamental understanding of the dynamics between the quality of the co-creation experience and platform identification.

The main discovery of this hypothesis is that, regardless of participants' level of identification with the platform, the quality of the co-creation experience maintains a constant influence on participation. This finding is particularly significant as it suggests that the platform is not the determining factor dictating how the co-creation experience impacts participation. Instead, the overall quality of the experience remains the primary driver of participants' motivation to actively engage in co-creation.

Viewed from this perspective, the platform can be considered a neutral environment in terms of influencing this relationship. Rather than being an active factor moderating the relationship between experience and participation, the platform is better understood as the context in which this relationship unfolds. This underscores the primacy of the co-creation experience itself, highlighting that the quality of this experience is the central factor that motivates or demotivates participation.

This finding also emphasizes the importance of focusing on improving the co-creation experience. The platform, while playing an essential role as a collaborative space, should not be considered the critical variable in the equation. Instead, it is the quality of the co-creation experience, irrespective of the platform, that shapes participation. This implies that efforts to optimize collaboration should concentrate on the experience itself.

Considering the gap identified in Wang and Miao (2015), it is relevant to emphasize the uniqueness of the research carried out, the conclusions of hypothesis 8 explore and contribute knowledge about innovativeness as an antecedent of co-creation. On the other hand, hypotheses 9 and 10 analyze the moderating role of innovativeness and contribute to this domain area.

Hypothesis 8 reveals that involving participants prone to innovation in co-creation environments can feel positive emotions such as excitement, curiosity, and satisfaction for contributing their ideas and suggestions Therefore, innovativeness emerges as a fundamental driving force within the co-creation experience. Furthermore, the results of hypothesis 8 contribute to clarifying the gap identified in Voorberg et al. (2014). Specifically, innovativeness can lead to more innovative and effective solutions to social problems, thanks to its contribution to a positive co-creation experience. These results can contribute to successful co-creation models that can serve as scalable templates for addressing challenges in different contexts, thereby increasing the reach and impact of social innovations.

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The results of hypothesis 8 also contribute to clarifying the gap identified in Russo-Spena et al. (2012) as they highlight that the collaboration of innovative participants as resource integrators in the context of co-creation practices is crucial for co-creation efforts. This implies the need to pay attention to some key strategies and considerations for firms to improve their co-creation practices. It is important to understand the needs and expectations of participants through detailed market research and participant segmentation, as well as to use participant feedback and data analysis to gain insights into preferences, pain points, and unmet needs.

The findings from hypothesis 9 shed light on the paramount significance of innovativeness as a moderating factor in the intricate interplay between platform identification and the co-creation experience. This underscores that innovativeness assumes a pivotal role, not only intrinsically but also in its capacity to shape and exert influence on how platform identification translates into the co-creation experience of participants. Within this context, innovativeness consistently operates as a catalyst, propelling the continuous exploration of imaginative avenues for contributing to the platform, thereby expanding co-creation opportunities in a distinctive manner. Consequently, platform identification culminates in a co-creation experience that is not only more enriching but also characterized by an enhanced level of innovation.

This deeper comprehension of the moderating function assumed by innovativeness suggests the need to tailor engagement and co-creation experience strategies in accordance with the varying profiles of innovativeness exhibited by participants. This adaptive approach enables platforms and organizations to finely calibrate their methods to cater to individual needs, ultimately rendering co-creation experiences more effective and resonant for all stakeholders involved. Hence, the moderation of innovativeness not only underscores the inherent importance of innovativeness but also accentuates how it exerts influence on the dynamics of co-creation within the context of platform identification.

The results of hypothesis 10 also underscore the vital role of innovativeness, highlighting the innovative capacity of the involved parties and exerting a significant impact on the quality of the outcomes achieved. These findings contribute to a deeper understanding of the complex interactive dynamics among the various factors that permeate the co-creation process. Innovativeness emerges as a critical element that shapes the relationships between these factors and, consequently, influences the events that transpire during co-creation.

Innovativeness plays a crucial role in determining the impact of the sense of community on the co-creation experience. It functions as a regulator, operating at an individual level within the community. This aspect adds nuance to our comprehension of how innovativeness manifests and how it influences the co-creation experience in different contexts.

It is important to note that innovativeness not only enriches the co-creation experience but also leads to more impactful results. Therefore, the promotion of innovativeness should not be underestimated, as it can be a powerful driver of success and effectiveness in co-creation processes. These conclusions have significant implications for those interested in enhancing collaboration and creativity in co-creation environments, providing a clearer insight into how innovativeness should be sought after to achieve more meaningful outcomes.

As identified by Vega-Vazquez et al. (2013), a study was conducted to analyze the impact of intermediary variables, taking into account the moderating effects of innovativeness, the sense of community, and platform identification. This study focused on a co-creation context, exploring how these variables influence the relationship between the co-creation experience and participation in it. The roles played by these variables are significant and amplifying.

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Innovativeness, as a moderating effect, regulates participants' willingness to adopt and embrace new ideas, technologies, or approaches. The more innovative they are, the more willing they are to experiment with new forms of co-creation and adopt innovations resulting from this process. This can significantly enhance the co-creation experience, making it more exciting and rewarding. Therefore, innovativeness has the potential to actively encourage people to engage in co-creation, as they are more inclined to value the opportunity to contribute new ideas and innovative solutions.

On the other hand, the sense of community focuses on the feeling of belonging to a social group and emotional connection with its members. This makes the co-creation experience more gratifying, as individuals feel like part of a cohesive, collaborative, and supportive group. Furthermore, it actively motivates participants to engage in co-creation, as they want to contribute to the community's success and benefit from the positive social interactions it provides. Finally, when acting as a moderator in co-creation, it serves as a fundamental pillar for strengthening the impact of the co-creation experience among participants.

Regarding platform identification, although it was considered as a potential moderator in this study, the results did not support this hypothesis. However, they supported its direct impact; platform identification can play an important role in creating a welcoming and trustworthy environment for co-creation, thus enhancing the participants' experience. This identification can foster greater engagement and a sense of belonging to the platform, thereby boosting participation in co-creation.

Following the suggestion made by Luo and Li (2022), which highlights the importance of studying what motivates people to participate in co-creation environments. Sense of community, innovativeness, and platform identification were studied as antecedents of co-creation. Co-creation is a collaborative process in which participants play a crucial role in value generation. Thus, the active participation of participants in this process is influenced by how they relate to the community, identify with the platform, and demonstrate innovativeness. The interdependence between the sense of community, platform identification, and innovativeness forms a motivational cycle. Together, these variables stimulate participants to engage actively in co-creating value, contributing to its growth.

In this context, the sense of community establishes the foundation for collaboration. When participants feel part of a cohesive community and share common values and interests, it creates an environment conducive to co-creation. This emotional and social connection generates a sense of belonging and a bond with the platform, leading participants to engage more actively. The sense of community is the motivating factor that drives them to contribute, as they feel part of something greater than themselves.

Platform identification complements the sense of community, expanding participants' identification with the underlying technological platform. When participants deeply identify with the platform, they not only establish an emotional connection but also connect with the technology and infrastructure supporting it. This identification reinforces the sense of virtual ownership and responsibility towards the platform. Participants view the platform as an extension of their digital identity, motivating them to actively contribute to co-create value, improve it, and adapt it to their needs.

Innovative participants are naturally motivated to explore new ideas, solutions, and improvements. Within a community where they identify with the platform and feel part of it, they see opportunities to innovate and make a difference. Innovation is often rewarded, whether through recognition in the community, tangible rewards, or the personal satisfaction of creating something new and useful. These rewards result in a better co-creation experience

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and further fuel motivation to actively participate in co-creation, feeding the cycle of innovation.

The gap identified in Ahn et al. (2020) highlights the need to examine the consequences of co-creation. In the subsequent hypotheses, these effects will be explored. Hypotheses 11a, 11b, 12a, and 12b focus on the direct effects, while hypotheses 13, 14, 15, and 16 address the indirect effects.

Hypotheses 11a and 11b offer valuable insights into the pivotal role that economic value plays when influenced by co-creation participation and co-creation experience. These hypotheses suggest that when individuals actively engage in the co-creation of products or services and have positive outcomes in this collaborative process, they can perceive benefits in the form of economic value. Importantly, these benefits may not necessarily manifest as direct monetary gains; instead, they are subjectively determined by the individuals themselves. This implies that people can make more informed decisions about how to engage in co-creation activities, recognizing that such engagement can positively impact their perceived and self-determined economic value.

Furthermore, it is crucial to recognize that participants who actively participate in co-creation and have meaningful experiences can perceive a greater personal value. They may feel that their contributions are not only acknowledged but also highly valued, which can significantly enhance their overall satisfaction and self-esteem.

Hypotheses 11a and 11b also underscore the critical importance of creating enjoyable and meaningful co-creation experiences for participants. This involves providing opportunities for individuals to engage in activities that genuinely pique their interest and add tangible value to their lives.

Moreover, these hypotheses highlight the substantial role that firms and organizations play in effectively communicating how participants can actively engage in the co-creation process and how their contributions are genuinely valued. This communication can serve as a catalyst for increased involvement and active participation among participants. It can also lead to the development of more personalized and relevant products or services that are tailored to the unique needs and desires of individuals.

Hypotheses 11a and 11b highlight the multifaceted and transformative role of economic value within the context of co-creation. They reveal how active participation and positive co-creation experiences can shape individuals' perceptions of economic value, leading to enhanced well-being, confidence, and a deeper sense of personal control and value creation.

The findings from hypotheses 12a and 12b underscore the pivotal role of relational value when influenced by co-creation participation and co-creation experience. These results emphasize that active engagement and positive experiences in co-creation activities can significantly enhance the relational value participants derive from these collaborative processes.

The data suggest that the quality of a participant's co-creation experience has a profound impact on the strength of the relational value they cultivate. When individuals actively participate in co-creation environments and have favorable experiences during this engagement, it bolsters the quality of their relationships with fellow participants. In essence, co-creation serves as a catalyst for forging deeper, more meaningful connections.

Furthermore, the findings indicate that co-creation can serve as a powerful means of strengthening personal relationships. Effective and positive collaboration among participants can lead to the development of stronger bonds and more meaningful connections with others involved in the co-creation process.

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These results also shed light on the influence of co-creation participation on individual decision-making. As participants perceive the relational value stemming from their co-creation efforts, they become more inclined to engage in additional co-creation activities. This inclination reflects a more informed and value-driven approach to their participation.

Effective communication and meaningful collaboration among co-creation participants emerge as critical factors. These elements not only enrich the co-creation experience but also foster deeper relationships among individuals engaged in co-creation activities. It is through such interaction that participants can fully harness the potential of co-creation to cultivate valuable connections.

Consequently, participation in co-creation and the cultivation of positive co-creation experiences can make substantial contributions to individuals' emotional and psychological well-being. The feeling of being valued and having a genuine influence over the co-creation process can generate a profound sense of accomplishment and personal happiness. This, in turn, significantly shapes participants' perceptions of relational value within co-creation environments.

Furthermore, co-creation empowers individuals by highlighting their ability to actively contribute to and influence the development of products or services. This newfound confidence and sense of control extend beyond co-creation activities, affecting their broader choices and personal relationships. Individuals base their decisions and interactions on the value they can discern in the relationships they nurture.

Co-creation yields direct benefits in terms of both economic value and relational value. It enhances participants' experiences, fosters positive relationships, and contributes to their emotional and psychological well-being, thereby influencing their perceptions of value in both economic and relational dimensions.

The results of hypotheses 13 and 14 shed light on the pivotal role that satisfaction plays when influenced by economic value and relational value in co-creation environments. These findings suggest that the interplay between these factors plays a crucial role in how individuals perceive and experience their interactions and experiences.

It is noteworthy that economic value, when perceived positively, significantly contributes to personal satisfaction. When participants feel that they are receiving fair or superior economic value in their interactions, this not only enhances their satisfaction with products and services but also impacts their overall well-being. This implies that consumption choices and the perception of receiving a good return on financial investment play a considerable role in people's satisfaction.

On the other hand, relational value also emerges as a critical factor. When participants experience meaningful connections, satisfying interpersonal relationships, and a sense of belonging and trust in their interactions, this has a direct and positive impact on their personal satisfaction. This underscores the intrinsic value of human relationships and the importance of nurturing and cultivating strong interpersonal bonds.

The role of satisfaction as the linchpin between economic value and relational value is pivotal. Personal satisfaction serves as the convergence point where these two types of value intersect and translate into greater well-being for individuals. When people are content with their experiences, products, or relationships, it not only enhances their emotional state but also reinforces their self-esteem and self-confidence, fostering an overall sense of happiness and contentment in their lives.

Therefore, personal satisfaction, when influenced by economic value and relational value, assumes a multifaceted role. It acts as a crucial indicator of the success of people's

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interactions and experiences, shaping their perception of the value they receive, whether in terms of material goods or human relationships.

The results of hypotheses 15 and 16 suggest that when participants' satisfaction increases, they are more likely to share positive experiences with others, and it is also more likely that they will continue to engage in co-creation experiences in the future. This highlights the crucial role played by satisfaction in promoting positive word-of-mouth and ongoing participation.

Participant satisfaction plays a vital role in promoting positive word-of-mouth. When participants are satisfied, they naturally have a greater inclination to share their positive experiences with friends, family, and colleagues. This inclination to recommend is driven by the confidence they have in their own positive experiences as they base their recommendations on gratifying personal experiences. Additionally, satisfaction acts as an intrinsic motivator, encouraging them to share this satisfaction with others, which, in turn, significantly increases the likelihood of positive word-of-mouth. In many cases, participants also have a desire to stand out as knowledgeable or to help others, motivating them to share their positive experiences. Consequently, satisfaction not only promotes recommendations but also strengthens loyalty to the experience, contributing to an increased likelihood of sharing positive experiences.

On the other hand, participants' satisfaction is also positively related to their future participation. When participants experience satisfaction, they are more likely to remain engaged in co-creation activities. This is because satisfaction creates a predisposition among participants to remain loyal and return to co-creation activities in the future. Additionally, satisfaction fosters increased interactions among all participants in co-creation environments and reduces the likelihood of participant attrition.

So, participant satisfaction plays a central role in promoting positive word-of-mouth and sustaining ongoing participation in co-creation environments. This understanding underscores the importance of ensuring high levels of satisfaction to create a virtuous cycle of recommendation and future engagement in co-creation contexts.

Contrary to what Gebauer et al. (2013) claim, which could be seen as a gap, one could argue that co-creation experiences do indeed exert influence on word-of-mouth, albeit through a more indirect path. This influence is channeled through several key factors, such as economic value, relational value, which subsequently influences satisfaction, ultimately shaping word-of-mouth. Furthermore, it can be argued that satisfaction or dissatisfaction has a direct impact on word-of-mouth.

Co-creation experiences can significantly impact word-of-mouth, albeit through a more indirect path. When participants are engaged in co-creation processes, they often perceive a greater economic value in their interactions. This economic value can manifest as cost savings or in a subjective manner that is not quantifiable in monetary terms, improved product quality, or personalized solutions. These positive economic outcomes, in turn, generate satisfaction and motivate participants to speak positively about their experiences to others. Therefore, co-creation experiences indirectly contribute to positive word-of-mouth through the economic value generated.

Additionally, co-creation experiences often foster strong relational connections between participants in co-creation environments. These relationships are built on trust, collaboration, and shared objectives. As participants engage in co-creation, they feel more connected, which leads to relational value. These strong relationships can motivate participants to recommend the co-creation environment to others as a way of endorsing and extending their positive co-creation experiences. Thus, co-creation experiences indirectly influence word-of-mouth

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through the created relational value, which is then channeled into satisfaction and, subsequently, word-of-mouth.

Furthermore, customer satisfaction is a crucial outcome of co-creation experiences. Satisfied participants are more likely to share their positive experiences with others. They may do so out of enthusiasm, gratitude, or a desire to help others benefit from similar positive experiences. In other words, they may do so because they genuinely enjoyed the co-creation process or because they appreciate the results achieved through co-creation. Their positive word-of-mouth becomes a means of expressing their satisfaction and encouraging others to participate in similar experiences. On the other hand, if participants are dissatisfied with the results of their co-creation efforts, they are more inclined to share their negative experiences with others as a warning or to express their disappointment. Negative word-of-mouth can spread rapidly and significantly influence the perceptions of potential customers.

While it may appear that co-creation experiences and satisfaction or dissatisfaction have no influence on word-of-mouth, a more nuanced perspective suggests that co-creation experiences indirectly influence word-of-mouth through economic and relational value, which subsequently influences satisfaction and, in turn, word-of-mouth. Satisfaction or dissatisfaction has a direct and tangible impact on word-of-mouth, whether positive or negative. These dynamics underscore the importance of managing both the co-creation process and customer satisfaction to foster positive word-of-mouth and enhance brand reputation.

The results obtained from both research models represent a significant contribution, addressing comprehensively the gap identified in Standing et al. (2015), which refers to the need to identify the benefits of co-creation when used on electronic communication platforms to facilitate interaction among participants. Moreover, the results obtained also allow us to address the gap identified by Vivek et al. (2014). Customer engagement in a co-creation environment can have a significant impact on various outcomes, including civic behavior and participant satisfaction.

Active participant engagement plays a crucial role in enhancing satisfaction in a co-creation environment. When participants actively engage in the creation process, they experience a sense of ownership and control. This empowerment can lead to higher levels of satisfaction for several reasons. Co-creation allows participants to customize products or services to better meet their needs and preferences. This customization can result in higher satisfaction because participants receive exactly what they desire.

On the other hand, engaged participants often provide valuable feedback and insights during the co-creation process. This feedback can lead to improvements in product quality, reducing the likelihood of dissatisfaction due to defects or deficiencies in the product.

In this way, by actively involving participants in the co-creation process, a sense of emotional connection and loyalty is fostered. Participants value the recognition of their contributions, leading to increased satisfaction and a stronger relationship among all.

Civic behavior refers to the positive and voluntary actions that participants undertake to support a firm beyond their basic expectations. In a co-creation environment, participant engagement can positively impact civic behavior. Engaged participants are more likely to become advocates for the co-creation environment and evangelize their experiences. They can voluntarily promote products or services to others, generating positive word-of-mouth and potentially attracting future participants.

Additionally, participants are often willing to provide constructive feedback and innovative ideas. This feedback can be invaluable for the firm's continuous improvement and

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innovation efforts. Participants, when feeling engaged and valued, are more likely to participate in loyalty programs, refer friends, or engage in surveys and research activities.

Therefore, participant engagement in a co-creation environment has a dual impact on customer satisfaction and civic behavior. Engaged participants tend to be more satisfied due to personalized experiences, improved product quality, and emotional connection. They are also more likely to exhibit civic behaviors, such as advocacy, feedback, and active participation, which contribute to the long-term success of the firm and its sustainability.

The response to the gap identified by Wang et al. (2016) sheds light on the intricate social dimension that permeates online co-creation communities. In this context, each participant plays a multifaceted role, revealing various facets of their personality, knowledge, and skills. This variety of perspectives contributes to the richness of collaboration and innovation within these communities.

What stands out is how participants interact. They not only share ideas and insights but also establish meaningful social connections. This happens because social norms, group pressures, and team dynamics play a vital role. Social norms shape behavior and expectations within the community, influencing how people contribute and behave. Group pressure can motivate members to actively engage in co-creation since they want to meet the expectations of their peers.

Furthermore, group dynamics are fundamental to the co-creation process. As participants interact and form teams, collaboration comes to life. Members may have different roles, diverse skills, and unique perspectives that complement each other, driving creativity and innovation. Social networks also play a crucial role. Within these communities, participants build networks of contacts and connections that go beyond the scope of the current co-creation project. These networks can serve as a source of support, inspiration, and future collaboration. Therefore, the social aspect not only affects ongoing co-creation but also lays the foundation for future innovation opportunities.

The gap identified in Zaborek and Mazur (2019) underscores the pressing need for a holistic approach in understanding the value creation process in co-creation environments. This approach goes beyond the traditional view of dyads between firms and customers and extends to systems involving a myriad of actors. Based on the results of hypothesis analysis, from a broad and inclusive perspective, it leads to a deeper understanding of the mechanisms through which firms facilitate co-creation in diverse contexts and how these mechanisms directly impact their performance.

As this perspective is explored, it begins to reveal the strategies of co-creation implemented by firms in a richer manner. This allows the identification of which practices and strategies prove to be more effective in promoting co-creation, resulting in sustainable performance benefits over time. These findings have the potential to translate into valuable practical guidance for firms seeking to enhance their co-creation approaches.

Considering the performance benefits of co-creation is also of great importance. These benefits can impact not only a firm's financial performance but also its long-term strategy and competitive position. By understanding how co-creation contributes to performance, firms can make informed strategic decisions regarding resource allocation, the development of co-creation partnerships, and maximizing their value and impact in the market.

Addressing co-creation not just as a firm-customer interaction but as part of broader, interconnected systems advances the understanding of the concept of co-creation. This more comprehensive and up-to-date understanding is essential for adapting to changes in market dynamics and embracing the transformative potential of co-creation.

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In the analysis found in Haro et al. (2014), the need to identify activities that impact both firms and consumers, both directly and indirectly, is highlighted. Co-creation activities play a fundamental role in this context, influencing factors such as trust, satisfaction, and loyalty.

In direct co-creation activities, such as the development of products or services, participants are invited to engage in workshops, focus groups, or other formats where they can provide feedback, suggestions, and even collaborate on creating products or services. This direct interaction establishes a deeper connection between firms and participants, as they perceive that their opinions are valued. This, in turn, promotes trust and satisfaction, as participants feel recognized. Additionally, idea co-creation platforms allow participants to submit and vote on product or service concepts, enabling customers to directly influence firm offerings. Many of these digital platforms are highly customizable, facilitating participation and co-creation.

Another relevant activity is user-generated content, encouraging participants to generate content related to a brand or product, such as reviews, testimonials, or social media posts. This constitutes a powerful form of direct co-creation. This participant-generated content not only increases trust and loyalty but also generates a positive word-of-mouth effect as other consumers rely on shared experiences.

On the other hand, in indirect co-creation activities, such as those related to online communities and forums, firms may not participate directly, but these spaces allow participants to interact with each other and share experiences. This creates an environment where customers can learn from each other and indirectly influence their opinions and feelings towards a brand or product. Furthermore, monitoring social media and online conversations about a brand or product allows firms to collect feedback and sentiment data indirectly. This information can be used to make improvements and, thus, increase customer satisfaction.

Another highly important activity is data analysis and personalization. Data analysis allows firms to identify improvement opportunities or develop new products and services that more accurately meet customer needs. This contributes to better personalization of recommendations and experiences, representing an indirect form of co-creation. By understanding customer preferences, firms can offer tailored solutions, thereby increasing satisfaction.

Taking into account the need identified in Akter et al. (2022) and Khrystoforova and Siemeniako (2019) to identify additional outcomes of co-creation, beyond the consequences mentioned earlier, and in accordance with the results obtained, an analysis of additional outcomes of co-creation is presented.

Co-creation allows for a wide variety of perspectives and ideas to be incorporated into the decision-making process. This diversity of viewpoints enriches the process, as different perspectives can inspire creative solutions and new approaches. As a result, participants obtain economic value and firms become more agile in creating products and services that meet market needs in a more advanced and effective way. Furthermore, the collaborative nature of co-creation enables firms to respond more rapidly to constantly evolving market trends and participants preferences.

Additionally, another identified outcome is related to the building of emotional bonds and loyalty. Customers and stakeholders who play a role in value creation develop a stronger emotional connection with the firm. They do not see themselves solely as consumers but as partners in a shared journey. This emotional loyalty leads to repeat purchases and enthusiastic advocacy for the brand, as they feel valued and engaged in the process.

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Transparent and collaborative approaches also enhance the firm's reputation, demonstrating a strong commitment to customer satisfaction. This suggests that co-creation can have the outcome of boosting reputation and customer retention, as it strengthens customer retention rates and positive word-of-mouth. This is because participants who feel valued and engaged are more likely to remain loyal and become advocates for the firm. By using word-of-mouth, they share their positive experiences with others, contributing to organic growth.

In this subsection, based on the results obtained from the research carried out, contributions to the theoretical and scientific knowledge about co-creation and SDL.

4.4 MANAGERIAL IMPLICATIONS

In this subsection, several suggestions are given on how to take advantage of the study carried out and how to put it into practice so that firms and consumers can benefit together. Thus, the implications that the study can have on the management of firms and their managers are addressed in a practical and quick way.

In hypothesis 1, the transformative potential of co-creation is highlighted, which is highly relevant both in terms of experience and participation. This implies the need to foster deeper engagement of those involved in co-creation environments so that there can be momentum to create opportunities for innovation and shared value, as well as the existence of opportunities for personalization.

In hypotheses 2 and 3, it is emphasized that the sense of community plays a significant role in promoting positive co-creation experiences and participation as it influences participants' behavior. This implies that promoting the sense of community and its associated values is essential to facilitate and enhance co-creation experiences, both in online and offline environments, and to motivate people to actively engage in the stages preceding co-creation. This implies that elements such as intrinsic motivation, trust, belonging, and shared responsibility will be fundamental in stimulating participation in collaborative activities. This will benefit both the community as a whole and its individual members, promoting mutual growth and the effective achievement of co-creation goals.

Additionally, in hypothesis 4, the sense of community is emphasized as highly relevant in co-creation, both for amplifying positive outcomes and mitigating negative ones, highlighting the importance of conducive co-creation environments to promote collaboration and value creation. This implies that organizations should invest in creating co-creation-friendly environments as they play a fundamental role in shaping participants' experiences and the effectiveness of the co-creation process.

Hypotheses 5 and 6 underscore that platform identification is of utmost importance in online co-creation environments, as it promotes interaction among participants and enhances the quality of the experience. This requires a careful and strategic approach in managing and designing co-creation platforms. Organizations should strategically design their platforms, considering not only interactions but also participants' emotions, engagement, and perception of value. Moreover, this implies the need to maintain a positive relationship among participants during the various interactions that occur on the platforms where co-creation takes place.

In hypotheses 8, 9 and 10, innovativeness is a highly important element as it empowers participants and enables the implementation of specific strategies to maximize the benefits of co-creation. It also underscores the relevance of co-creation as a powerful tool for maximizing the positive impact of strong communities and platforms, provided it is conducted effectively and participant-centered. This implies the need for select participants to the co-creation

endeavors that are prone to innovation to increase its potential for success. As a result, co-creation efforts should target specific innovative individuals.

The responses found for the gaps in Vega-Vazquez et al. (2013) and Luo and Li (2022) emphasize the complexity of the dynamics involved in co-creation and the importance of considering factors such as innovativeness, sense of community, and platform identification to promote effective collaboration and participant engagement. This can be valuable for organizations, businesses, and communities looking to make the most of value co-creation. Organizations should adapt their strategies according to the characteristics of their participants and the context of co-creation. This implies that there is no one-size-fits-all approach, and customization is essential.

Another relevant gap that yielded results from the co-creation literature is the one identified by Bu et al. (2022). Credibility is recognized as a solid foundation that creates and maintains a trusted environment among participants. This is essential because when participants trust the source and the platform they are involved in, they feel more secure and committed. This implies that building and maintaining participants' trust is fundamental to creating an effective collaborative community, promoting innovation, and sustaining collaboration over time. This is relevant both for organizations seeking to create co-creation platforms and for communities looking to strengthen their collaborative bonds.

Hypotheses 11a and 11b highlight that co-creation can positively impact the perception of economic value, contributing to emotional well-being, trust, and a sense of control. For organizations and communities seeking to promote co-creation, this implication provides valuable insights on how to create more effective and meaningful collaborative environments. This will lead to greater engagement and satisfaction, as well as products and services more aligned with market and consumer needs. This can result in a sustainable competitive advantage and a positive market reputation.

Similarly, in hypotheses 12a and 12b, co-creation stands out for its potential to positively impact relational value and the emotional well-being of participants. This implies the need to pay close attention to how co-creation experiences are created to make them meaningful and positive, communicate relational benefits, and promote a culture of constructive collaboration to reap these benefits in terms of stronger relationships and ongoing participation. These are key factors for the success of co-creation environments.

As highlighted in hypotheses 13 and 14, economic value and relational value in co-creation environments play a crucial role in influencing satisfaction. This implies that understanding and managing this complex interaction is fundamental to the success of co-creation initiatives and overall participant satisfaction. This requires adapting strategies to the specific needs of organizations and participants involved in co-creation. Additionally, flexibility and openness to adjustments as needed are necessary.

Again, in hypotheses 15 and 16, the role of satisfaction in promoting positive word-of-mouth and sustaining future participation is fundamental to the success of co-creation initiatives. By focusing on participant satisfaction and creating meaningful experiences, organizations can harness the power of positive word-of-mouth to expand their initiatives and foster ongoing engagement of participants. This will entail a constant commitment to excellence and participant satisfaction in co-creation environments to reap the benefits of positive word-of-mouth in the long term and continued involvement in future initiatives.

The response to the gap identified in Gebauer et al. (2013) highlights that co-creation experiences can significantly impact word-of-mouth, both directly and indirectly, through economic and relational value, satisfaction, and recommendations. Organizations should

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consider these dynamics when implementing co-creation strategies and focus on managing the co-creation process to enhance customer satisfaction and generate positive word-of-mouth.

In response to the gap identified in Vivek et al. (2014), it emphasizes that participant engagement in co-creation environments has a dual impact, positively influencing both customer satisfaction and civic behavior. Engaged participants enjoy personalized experiences, improved product quality, and emotional connections, leading to higher satisfaction. Simultaneously, they actively participate in advocacy, feedback, and loyalty activities, all of which collectively contribute to the firm's lasting success. Organizations should consider these implications when designing and managing co-creation initiatives to maximize their effectiveness and benefits.

Additionally, in response to the gap identified in Standing et al. (2015), co-creation is a mechanism that positively influences social interactions, knowledge creation, operational efficiency, and innovation. This implies that co-creation should not only be used as an organizational strategy but to create effective and meaningful co-creation environments that benefit all involved throughout all activities.

However, the response to the gap identified in Wang et al. (2016) emphasizes that intrinsic and extrinsic motivations are not mutually exclusive; on the contrary, they enable organizations to develop more sophisticated strategies to maintain and stimulate active participation in online co-creation communities. This approach implies that co-creation environments should be more personalized to result in benefits for both participants and the co-creation initiatives themselves due to increased active participation, greater participant satisfaction, and greater effectiveness of co-creation initiatives.

The response to the gap identified in Zaborek and Mazur (2019) recognizes the importance of interactions and collaborations among stakeholders, becoming crucial, especially in contexts where co-creation goes beyond traditional firm-consumer relationships. This implies that co-creation needs to be within broad and interconnected frameworks to harness its transformative potential, enabling firms to remain agile and competitive in ever-evolving business scenarios.

The response to the gap identified in Haro et al. (2014) emphasizes that co-creation activities, either directly or indirectly, have a substantial impact on trust, satisfaction, and customer loyalty. This means that firms need to have well-defined co-creation strategies capable of operating at various levels of depth to strengthen their relationships with consumers and enhance ongoing connectivity performance with their partners, customers, and other relevant stakeholders.

Finally, in response to the gaps identified in Akter et al. (2022) and Khrystoforova and Siemeniako (2019), co-creation can contribute to various aspects of organizational performance and strategy, including innovation, customer loyalty, operational efficiency, reputation, internal collaboration, as well as sustainability. This may involve being receptive to new ideas for creating products or services aimed at new market segments, broadening the participant base and promoting sustainability.

4.5 Limitations and Futures Lines of Research

In this subsection the limitations that were felt throughout the study are indicated and future lines of investigation are presented so that other researchers, if they wish, can continue with this work.

A relevant limitation is related to the motivations of participants in co-creation, especially in highlighting the importance of social co-creation as an agent of change that goes beyond conventional expectations. Although the motivations that influence the engagement and active

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participation of participants in co-creation environments have been partly answered, more studies are needed for a more complete understanding of the motivations of participants in co-creation environments.

The relationship between different types of communities and sectors can vary significantly depending on the context in which co-creation and SDL are introduced. It is important to recognize that generalizing these concepts may not be applicable to all situations. Therefore, future research should address specific issues, such as the influence of organizational culture on the involvement of community members in co-creation processes.

In addition, it is essential to investigate how this influence varies in different sectors and types of communities. It is essential to analyze how the nature of the environment affects the relationships between participants and how co-creation dynamics differ in online communities, such as forums and social networks, compared to physical communities, such as local groups.

The study focuses mainly on the positive aspects of the constructs considered antecedents of co-creation. However, there may be associated limitations and challenges that have not been explored. Future research should consider both the positive aspects and the potential obstacles.

The study emphasizes participant satisfaction as a result of co-creation but does not consider the effectiveness of the products or services created through co-creation. Therefore, future research should investigate how the quality of co-created products or services compares to those developed in the traditional way and include the analysis of attributes such as performance, durability, reliability, among others.

An underlying limitation is the cultural challenges that can arise when implementing co-creation strategies, especially in international contexts. Cultural differences can have a significant impact on the effectiveness of strategies. Therefore, future research should investigate how cultural differences, such as values, beliefs, and norms, affect the implementation of co-creation strategies in international contexts and how these differences influence communication, collaboration and co-creation outcomes and SDL.

The study's lack of focus on the possible disadvantages or challenges associated with co-creation, such as conflicts between participants, resistance to change or data security issues, limits our full understanding of the complexities involved. It is therefore crucial that future research addresses these issues more comprehensively.

One promising avenue for future research is to investigate how conflicts between participants can arise during co-creation processes and how organizations can effectively deal with these conflicts. In addition, it is crucial to explore the underlying reasons for resistance to change on the part of participants during the co-creation process and to identify strategies that organizations can employ to overcome this resistance.

In addition, the data security concerns associated with co-creation and SDL, especially in contexts where confidential information may be shared, merit further analysis. Investigating the security measures needed to protect participants' data and ensure compliance with relevant regulations is essential to promoting trust and integrity in co-creation initiatives.

Due to the great evolution that has taken place in SDL and value co-creation, it may be necessary to refine and explore these two themes in greater depth to fully understand their potential. It would therefore be highly relevant to carry out studies to understand how firms can take advantage of technology to improve the co-creation of value in their sectors. In addition, it is important to conduct research to clarify how SDL can contribute to promoting sustainability and corporate social responsibility, as well as to identify the environmental and social impacts of its implementation.

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Likewise, it is important to determine how to measure and evaluate the value created through SDL and value co-creation. It is therefore necessary to carry out future studies aimed at establishing effective metrics to track the progress of value co-creation. This is especially important in diverse international and cultural contexts, to understand the challenges that the internationalization of firms imposes on them.

The results of the study also suggest that firms may need to rethink marketing concepts and revalidate previously known strategies to implement new strategies that may emerge from SDL. Therefore, it becomes relevant to carry out future studies to analyze the marketing strategies that emerge from SDL, to understand how firms can adjust their traditional strategies to align them with SDL principles.

In addition, it is important to investigate how organizations can undergo a complete organizational transformation to adopt SDL and understand what the challenges and best practices are in this process. The adoption of a new strategy and a new concept of business organization makes it necessary to study how the implementation of SDL affects the internal culture of organizations and how they can create a culture that promotes the co-creation of value.

In this context, it is also essential to conduct studies on effective strategies for involving customers in the co-creation of value and how firms can encourage active customer participation. Additionally, it is relevant to conduct research to understand how firms can establish effective collaborations and partnerships with other actors in the value chain, as well as how to ensure ethical practices in their interactions.

From the study it emerges that there are still some challenges that arise from the dynamic interaction between the various participants in co-creation environments in the field of collaboration. These challenges include managing expectations, satisfying diverse needs and navigating a delicate balance between aspiration and achievability. This calls for future research into how mass customization influences customer satisfaction in co-creation and what its limits are. Above all, firms can continue to take advantage of co-creation to drive innovation with the possibility of customers' ideas being effectively integrated into product or service development processes. In addition to these suggestions, future research could explore the impact of co-creation on customer satisfaction in different sectors, the factors that influence the effectiveness of co-creation and strategies for overcoming the challenges of co-creation.

Bearing in mind that active collaborative participation over time can eventually lead to dissatisfaction among participants due to the continuous adjustment of expectations, it becomes evident that some limitations of SDL may require further refinement. In addition, challenges related to managing expectations and meeting participants' needs also become apparent.

It is therefore essential to direct future research towards understanding how the maturity of co-creation, i.e., the length of time participants have been involved, influences satisfaction. This would help to understand how participants' expectations evolve over time. In addition, it is important to investigate how the different phases of the life cycle of the participants' experience relate to co-creation and satisfaction, as well as how expectations can be managed throughout this life cycle.

On the other hand, it is relevant to explore proactive strategies that can be adopted to effectively manage and communicate what participants can and cannot expect. In addition, future studies should address how sustainable value co-creation can be promoted to avoid long-term dissatisfaction and what sustainable practices can be successfully implemented.

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In this subsection the limitations that were felt throughout the study were indicated and future lines of investigation were presented so that other researchers, if they wish, can continue with this work.

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APPENDIX: QUESTIONNAIRE SURVEY

DOCTORAL PROGRAM IN BUSINESS MANAGEMENT
SANTIAGO DE COMPOSTELA UNIVERSITY

I am a PhD student from the University of Santiago de Compostela - Spain, who is conducting research on CO-CREATION.

The information provided is confidential and exclusive use by the research group. The data will be used only for analysis and the results are presented in aggregate.

QUESTION SELECTION: Have you ever participated in any development of this platform? If YES, please continue.

1. INTRODUCTION

Please rate the extent to which you agree with the following statements (1. Disagree strongly - 7. Agree strongly).

SATISFACTION	1	2	3	4	5	6	7
1. I am satisfied with the services provided.	❑	❑	❑	❑	❑	❑	❑
2. This platform is a good option to do business with.	❑	❑	❑	❑	❑	❑	❑
3. The service of this platform meets my expectations.	❑	❑	❑	❑	❑	❑	❑
4. Overall, I am satisfied with the service provided by this platform.	❑	❑	❑	❑	❑	❑	❑

WORD-OF-MOUTH	1	2	3	4	5	6	7
5. I say positive things about this platform to other people.	❑	❑	❑	❑	❑	❑	❑
6. I recommend this platform to someone who seeks my advice.	❑	❑	❑	❑	❑	❑	❑
7. I can recommend this platform without any concerns.	❑	❑	❑	❑	❑	❑	❑

PLATAFORM IDENTIFICATION	1	2	3	4	5	6	7
8. I strongly identify with this platform.	❑	❑	❑	❑	❑	❑	❑
9. I feel good to be user of this platform.	❑	❑	❑	❑	❑	❑	❑
10. I like to tell that I am user of this platform.	❑	❑	❑	❑	❑	❑	❑
11. This platform fits well to me.	❑	❑	❑	❑	❑	❑	❑
12. I feel attached to this platform.	❑	❑	❑	❑	❑	❑	❑

FUTURE PARTICIPATION	1	2	3	4	5	6	7
13. I'm interested in participating in other projects	❑	❑	❑	❑	❑	❑	❑
14. I'm Interested to propose more ideas in the next events	❑	❑	❑	❑	❑	❑	❑
15. I'm Interested in making new discoveries	❑	❑	❑	❑	❑	❑	❑
16. I'm interested in customizing more the experience	❑	❑	❑	❑	❑	❑	❑

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2. SENSE OF COMMUNITY

Please rate the extent to which you agree with the following statements (1. Disagree strongly - 7. Agree strongly).

	1	2	3	4	5	6	7
1. I consider myself as a member of this Community.	❑	❑	❑	❑	❑	❑	❑
2. I think this community platform is a good place to spend my spare time.	❑	❑	❑	❑	❑	❑	❑
3. I feel closely connected to other participants of this Community.	❑	❑	❑	❑	❑	❑	❑
4. I feel a sense of kinship with other Community members.	❑	❑	❑	❑	❑	❑	❑
5. I have a strong desire to further interact with participants of this Community.	❑	❑	❑	❑	❑	❑	❑

3. INNOVATIVENESS

Please rate the degree to which each statement projects your own image and belief (1. Disagree strongly - 7. Agree strongly).

	1	2	3	4	5	6	7
1. I often risks doing things differently.	❑	❑	❑	❑	❑	❑	❑
2. I have original ideas.	❑	❑	❑	❑	❑	❑	❑
3. I cope with several ideas at the same time.	❑	❑	❑	❑	❑	❑	❑
4. I proliferate ideas.	❑	❑	❑	❑	❑	❑	❑
5. I have fresh perspectives on old problems.	❑	❑	❑	❑	❑	❑	❑
6. I am stimulating.	❑	❑	❑	❑	❑	❑	❑
7. I will always think of something when stuck.	❑	❑	❑	❑	❑	❑	❑
8. I can stand out in disagreement against a group.	❑	❑	❑	❑	❑	❑	❑
9. I would sooner create than improve.	❑	❑	❑	❑	❑	❑	❑
10, I like to vary set routines at a moment's notice.	❑	❑	❑	❑	❑	❑	❑
11. I need the stimulation of frequent change.	❑	❑	❑	❑	❑	❑	❑

4. CO-CREATION EXPERIENCE

Please rate the extent to which you agree with the following statements (1. Disagree strongly - 7. Agree strongly).

COMPETENCE	1	2	3	4	5	6	7
1. Participation in the development of the platform made me feel smart.	❑	❑	❑	❑	❑	❑	❑
2. Participation in the development of the platform made me feel competent.	❑	❑	❑	❑	❑	❑	❑
3. Participation in the development of the platform made me feel talented.	❑	❑	❑	❑	❑	❑	❑
4. Participation in the development of the platform made me feel intelligent	❑	❑	❑	❑	❑	❑	❑

AUTONOMY	1	2	3	4	5	6	7
5. I had a great deal of freedom to make choices when participating in the development of the platform.	❑	❑	❑	❑	❑	❑	❑
6. I was able to express myself when participating in the development of the platform.	❑	❑	❑	❑	❑	❑	❑
7. I felt controlled when participating in the development of the	❑	❑	❑	❑	❑	❑	❑

platform.							
8. I felt pressured when participating in the development of the platform.	❑	❑	❑	❑	❑	❑	❑

TASK ENJOYMENT	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9. I enjoyed participating in the development of the platform.	❑	❑	❑	❑	❑	❑	❑
10. I had a good time participating in the development of the platform.	❑	❑	❑	❑	❑	❑	❑
11. Participation in the development of the platform was a lot of fun.	❑	❑	❑	❑	❑	❑	❑
12. Participation in the development of the platform was very satisfying.	❑	❑	❑	❑	❑	❑	❑
13. I felt annoyed when participating in the development of the platform.	❑	❑	❑	❑	❑	❑	❑
14. I felt frustrated when participating in the development of the platform.	❑	❑	❑	❑	❑	❑	❑

5. CO-CREATION PARTICIPATION

Please rate the extent to which you agree with the following statements (1. Disagree strongly - 7. Agree strongly).

	1	**2**	**3**	**4**	**5**	**6**	**7**
1. I spent a lot of time-sharing information about my needs and opinions with the staff during the service process.	❑	❑	❑	❑	❑	❑	❑
2. I put a lot of effort into expressing my personal needs to the staff during the service process.	❑	❑	❑	❑	❑	❑	❑
3. I always provide suggestions to the staff for improving the service outcome.	❑	❑	❑	❑	❑	❑	❑
4. I have a high level of participation in the service process.	❑	❑	❑	❑	❑	❑	❑
5. I am very much involved in deciding how the services should be provided.	❑	❑	❑	❑	❑	❑	❑

6. VALUE

Please rate the extent to which you agree with the following statements (1. Disagree strongly - 7. Agree strongly).

ECONOMIC VALUE	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. My participation helps me receive higher quality services.	❑	❑	❑	❑	❑	❑	❑
2. My participation helps me receive more customized services.	❑	❑	❑	❑	❑	❑	❑
3. My participation helps me receive more professional services.	❑	❑	❑	❑	❑	❑	❑
4. My participation helps me receive more control over the services quality.	❑	❑	❑	❑	❑	❑	❑
5. My participation helps me receive less service failure.	❑	❑	❑	❑	❑	❑	❑
RELATIONAL VALUE	1	2	3	4	5	6	7
6. My participation helps me build a better relationship with the service provider.	❑	❑	❑	❑	❑	❑	❑
7. My participation makes the service interaction more enjoyable.	❑	❑	❑	❑	❑	❑	❑
8. My participation helps me receive relational approval from the service provider.	❑	❑	❑	❑	❑	❑	❑

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7. PROFILE

7.1 – Gender:

- ❑ - Male
- ❑ - Female

7.2 – Age: _____

7.3 – Nationality: _____

7.4 - Country of residence: _____

7.5 - Level of studies:

- ❑ - Doctoral,
- ❑ - Master,
- ❑ - Graduate,
- ❑ - High School.

7.6 - Work status:

- ❑ - Employee,
- ❑ - Unemployed,
- ❑ - Student,
- ❑ - Retired.

7.7 - Work type:

- ❑ - Private Enterprise,
- ❑ - Public Administration,
- ❑ - Freelancer,
- ❑ - Student,
- ❑ - Retired.

7.8 - I participate as:

- ❑ - User / Customer with suggestion,
- ❑ - User / Customer without suggestion,
- ❑ - The platform development engineer,
- ❑ - I'm not User / Customer, but I have curiosity,
- ❑ - I'm not User / Customer, but these platform is in my firm.

7.9 - Level of use:

- ❑ - Basic user,
- ❑ - Intermediate user,
- ❑ - Advanced user,
- ❑ - Specialist user.

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Service-Dominant Logic (SDL) redefines goods and services, emphasizing that firms act as service providers using goods for service delivery. Co-creation, central to SDL, involves customer participation in personalized service design. The study explores co-creation participation and experience, linking it to factors like sense of community and innovativeness. The research, conducted via a Linux community survey, highlights economic and relational benefits of co-creation. Key factors in co-creation, such as platform identification, sense of community, and innovativeness, play a crucial role in successful collaboration, fostering meaningful relationships and connections with firms.