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ASSESSING THE ADOPTION OF EHEALTH TECHNOLOGY IN THE JORDAN HEALTHCARE SYSTEM: AN EXTENSION OF THE UTAUT MODEL

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ASSESSING THE ADOPTION OF EHEALTH TECHNOLOGY IN THE JORDAN HEALTHCARE SYSTEM: AN EXTENSION OF THE UTAUT MODEL

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ABSTRACT

Technological advancements have impacted the healthcare industry, leading to the emergence of eHealth. However, patients remain hesitant to embrace medical treatments through eHealth applications, which has caused a delay in the worldwide adoption of such applications. This reluctance remains a challenge despite the introduction of numerous models, such as UTAUT.

This empirical study aims to developing and validating an eHealth adoption model that focuses on patients' viewpoints and enables quantitative survey research. A patients' value model was developed and tested using structural equation modeling with cross-sectional data from 430 Jordanian patients who use the MyHakeem app.

The findings reveal that patients' public value significantly influences the utilization of the MyHakeem app, with habit formation mediating. Furthermore, stimulus factors, such as perceived usefulness, patient empowerment, eHealth justice, and privacy concerns, are identified as critical determinants shaping patients' public values. The study offers theoretical implications, emphasizing the importance of patients' public value, perceived usefulness, patient empowerment, and ethical considerations in eHealth adoption.

Practical implications for healthcare policymakers, practitioners, and software developers are also elucidated, highlighting the need for patient-centric eHealth interventions that align with patients' values and preferences. The study identifies strategies to enhance adoption, including addressing privacy concerns, empowering patients, promoting social support, ensuring eHealth justice, and upholding ethical standards.

While contributing to the academic literature, the study acknowledges limitations related to sample size and the specific context of Jordan's emerging economy. Future research directions are suggested, including longitudinal studies and investigations into healthcare provider settings. Overall, this study contributes valuable insights into eHealth adoption, paving the way for more effective healthcare technologies.

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LIST OF ABBREVIATION

eHealth	Electronic Health
mHealth	Mobile Health
SEM	Structural Equation Modelling
UTAUT	Unified Theory of Acceptance and Use of Technology
TAM	Technology Acceptance Model
S-O-R	Stimulus-Organism-Response
Post-NPM	Post-New Public Management
PV	Public Value
S-D	Service-Dominant
TBHV	Theory of Basic Human Values
DLPFC	Dorsolateral Prefrontal Cortex
OFC	Orbitofrontal Cortex
VmPFC	Ventromedial Prefrontal Cortex
NHS	National Health Service
CMS	Centers for Medicare and Medicaid Services
VBHC	Value-Based Healthcare
CEA	Cost-Effectiveness Analysis
QALY	Quality-Adjusted Life Year
EHR	Electronic Health Records
PSM	Public Service Motivation
ICT	Information and Communication Technology
SCT	Social Cognitive Theory
TRA	Theory of Reasoned Action
IDT	Innovation Diffusion Theory
MM	Motivational Model
MPCU	Model of PC Utilization
VAM	Value-Based Adoption Model
HIT	Health Information Technology
EPP	Electronic Patient Portal
CEST	Cognitive-Experiential Self-Theory
WHO	World Health Organization
GDPR	General Data Protection Regulation
EHS	Electronic Health Solutions
EFA	Exploratory Factor Analysis
CFA	Confirmatory Factor Analysis
KMO	Kaiser-Meyer-Olkin
MLF	Maximum Likelihood Factoring
PAF	Principal Axis Factoring
MIs	Modification Indexs
CFI	Comparative Fit Index

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RMSEA	Root Mean Square Error of Approximation
SRMR	Standardized Root Mean Square Residual
CR	Critical Ratio
SRW	Standardized Regression Weights
URW	Unstandardized Regression Weights
S.E.	Standard Error
CMB	Common Method Bias
CMV	Common Method Variance
AVE	Average Variance Extracted
HTMT	heterotrait-Monotrait
MSV	Maximum Shared Squared Variance
CR	Composite Reliability
NS	Not Significant
MGA	Multiple Group Analysis
AMOS	Analysis of Moment Structures
CIs	Confidence Intervals
VTA	Ventral Tegmental Area

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RESUMEN

En las últimas décadas, los importantes avances tecnológicos han tenido un impacto espectacular en varios aspectos de la vida profesional y personal de los seres humanos. La era actual se distingue por un auge sin precedentes de la revolución digital, que gira en torno a la utilización de la tecnología para aumentar significativamente el alcance y la eficiencia de las empresas y las entidades gubernamentales. Este maremoto de innovaciones tecnológicas, que h se ha convertido en un auténtico tsunami, ha remodelado notablemente el sector sanitario (Iyanna et al., 2022) dando lugar al concepto de sanidad electrónica (Junaid et al., 2022). Las tecnologías sanitarias electrónicas hacen referencia a numerosas innovaciones que facilitan la prestación de atención médica y otros servicios sanitarios a través de Internet o de aplicaciones móviles. Estas innovaciones abarcan una serie de tecnologías, como las aplicaciones sanitarias móviles, los servicios de telemedicina basados en la web, las nubes sanitarias, los sistemas de ropa inteligente, los sistemas de historia clínica electrónica (HCE) y la introducción informatizada de órdenes de médicos y proveedores (CPOE) (Talwar et al., 2023).

La sanidad electrónica, combinada con la IA, la computación en la nube, el IoT y los dispositivos wearables, ha revolucionado la atención sanitaria (Gu et al., 2019). Su capacidad para abordar los retos de la medicina la ha convertido en un componente esencial del sistema sanitario. Las historias clínicas electrónicas, por ejemplo, ayudan a evitar errores en el tratamiento de los pacientes (da Fonseca et al., 2021).

En cuanto a la región de Oriente Medio, algunos países han incorporado diversas iniciativas de sanidad electrónica, entre ellos Jordania (Alanezi, 2021). Sin embargo, la adopción de la tecnología de eSalud sigue siendo limitada en el mundo árabe, y menos del 12% de las instituciones sanitarias ofrecen portales electrónicos de pacientes (PEP) como los que ya se han implantado con éxito en algunas naciones desarrolladas. Aunque en Jordania ha habido intentos de introducir proyectos de sanidad electrónica de alcance limitado desde 2008 (Murshidi et al., 2022), la noción de sanidad electrónica sigue siendo relativamente nueva en esta región.

En Jordania, la iniciativa nacional de sanidad electrónica, Hakeem (https://ehs.com.jo/hakeem- program), ofrece dos plataformas principales para pacientes. La primera plataforma, Hakeem Electronic Services (E-Med), facilita a los pacientes que ya reciben atención médica en cualquiera de los centros sanitarios automatizados dependientes de los Servicios Médicos Reales de Jordania o del Ministerio de Sanidad el acceso a los servicios que necesitan por vía electrónica, sin necesidad de acudir personalmente a los centros sanitarios (EHS, 2022). Esta plataforma comprende tres servicios electrónicos principales: reposición de medicamentos, citas de seguimiento y telemedicina.

La segunda plataforma, MyHakeem Mobile Application, es una plataforma web y una aplicación móvil que permite a los usuarios acceder y consultar cómodamente sus citas médicas reservadas con antelación, así como la información médica necesaria, como medicamentos activos y pendientes, vacunas recientes, pruebas de laboratorio pendientes y completas, alergias, constantes vitales y datos demográficos. Estos datos se almacenan de forma segura en la historia clínica electrónica del usuario, registrada en la institución sanitaria que implanta el programa Hakeem. Esta aplicación también permite a los pacientes recibir su medicación

mensual sin complicaciones, sobre todo si no pueden acudir físicamente al hospital (EHS, 2022). Más de cinco millones de historiales de pacientes se han convertido a formato digital y se han almacenado de forma segura en el programa Hakeem desde su implantación hace casi una década (Bani-Salameh et al., 2021; Karim et al., 2021).

Aunque los jordanos tienen una impresión positiva de la telemedicina, la implantación generalizada de la sanidad electrónica a nivel nacional aún está lejos de completarse. Los pacientes se muestran reacios a utilizar las aplicaciones de sanidad electrónica por motivos de privacidad, obtención de un diagnóstico correcto y errores médicos (Murshidi et al., 2022; Schreiweis et al., 2019), lo que dificulta su aceptación (Rahi, 2022).

Por el contrario, los investigadores han utilizado varios modelos teóricos para estudiar la adopción de la tecnología por parte de los usuarios, incluido el UTAUT, que se ha utilizado en muchos estudios anteriores para comprender la adopción de la eSalud por parte de los pacientes (Gu et al., 2021; Momani, 2020; Schreiweis et al., 2019).. Sin embargo, UTAUT ha sido criticado por ser demasiado simplista y centrarse únicamente en las percepciones individuales de los adoptantes y las intenciones generales de uso, proporcionando poca información sobre el uso de la tecnología (Nguyen, 2022; Shachak et al., 2019)..

Kim y sus colegas (2019) han profundizado en este argumento, planteando que una baja tasa de adopción puede sugerir que aún es necesario identificar estrategias óptimas para implementar aplicaciones de telemedicina de manera efectiva. Esto no parece ajeno al hecho de que las teorías actuales (como TAM y UTAUT) guían la ejecución de las intervenciones de eSalud (Heinsch et al., 2021; Rahi, 2022). En consecuencia, es esencial reconocer que las tecnologías emergentes como la eSalud tienen múltiples facetas en la mente de los usuarios en lo que respecta a su uso. A su vez, para que estas tecnologías sean adoptadas, deben alinearse con los valores y necesidades existentes de los pacientes (Razmak et al., 2018).

No obstante, la bibliografía existente relacionada con el valor público, en particular la conceptualización psicológica del valor público de Meynhardt, ofrece un marco teórico sólido y un conjunto de ideas claramente definidas que pueden emplearse para evaluar las aplicaciones de sanidad electrónica desde la perspectiva de los pacientes. A diferencia de los conceptos propuestos por Moore y Bozeman, Meynhardt ofrece una comprensión más profunda del valor público. No sólo establece una base para el valor público a través de un enfoque relacional de los valores y lo fundamenta en la base ontológica de las necesidades humanas fundamentales, sino que también lo conecta con un concepto de lo público que se basa profundamente en las percepciones y comprensiones de los individuos. En términos sencillos, el valor público se deriva de las necesidades fundamentales, que sirven de base para crear valor público (Meynhardt et al., 2017).

Esta percepción, por tanto, ofrece los microfundamentos esenciales y una conexión teórica con el macronivel (Meynhardt & Jasinenko, 2021), explicando cómo la experiencia y el comportamiento humanos emergen de un conjunto de necesidades básicas que los individuos se esfuerzan por satisfacer para vivir saludablemente (Epstein, 1998; Meynhardt et al., 2017). Además, investigaciones anteriores han demostrado que es más probable que los pacientes adopten aplicaciones de salud electrónica que respondan a sus necesidades específicas (Jacob et al., 2022). Sin embargo, el éxito de las tecnologías de eSalud también depende de lo bien que se alineen con los valores y creencias de los pacientes (Razmak et al., 2018). Por lo tanto, es esencial desarrollar herramientas de eSalud adaptadas para satisfacer las necesidades reales de los pacientes sin dejar de ser coherentes con sus valores y creencias.

Por lo tanto, este estudio pretende colmar esta laguna desarrollando y validando un modelo de adopción de la sanidad electrónica que se centre en los puntos de vista de los pacientes y

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permita realizar una investigación cuantitativa mediante encuestas. Este objetivo general se desglosa en los siguientes objetivos específicos:

1. Validar el modelo de valor de los pacientes
2. Conocer los principales valores públicos que tienen los pacientes en Jordania respecto al uso de la iniciativa de sanidad electrónica "MyHakeem".
3. Conocer en qué medida el modelo de valores de los pacientes predice el uso real de la tecnología de eSalud con o sin mediadores entre los pacientes jordanos.
4. Conocer en qué medida los factores de estímulo inherentes a una app de eSalud influyen en la valoración pública de los pacientes cuando utilizan la tecnología de eSalud.

Para alcanzar estos objetivos, el estudio desarrolló un modelo basado en el marco Estímulo-Organismo-Respuesta, que incluye tres capas. En primer lugar, la capa de estímulos engloba los beneficios percibidos, la calidad de la prestación de eSalud, la utilidad, la capacitación del paciente, la influencia social, la justicia en eSalud y la preocupación por la privacidad. La segunda capa, que es la de organismo, incluye el valor público de los pacientes, que es el valor experimentado por los pacientes en el contexto de su relación con el sistema de salud electrónica, basado en evaluaciones subjetivas relacionadas con sus necesidades básicas. Por su parte, el valor público de los pacientes comprende la motivación hedonista, la motivación utilitaria, el valor social, el valor ético y el valor de confianza. Cuando los pacientes adoptan y comparten colectivamente estos cinco valores, se convierten en públicos, lo que permite la integración de los niveles micro y macro de adopción en las iniciativas de eSalud. La última capa, los resultados o respuestas de las motivaciones de los pacientes para utilizar la eSalud, engloba la intención de implantación, el hábito y el uso de la eSalud. Al incorporar estas tres capas, se ha propuesto un total de 15 hipótesis para investigar la relación entre los factores de estímulo, las dimensiones de valor público de los pacientes y las respuestas a las motivaciones de los pacientes para utilizar la eSalud; para más detalles, consulte la Fig. 26 y el Apéndice 14.

Para comprobar las hipótesis, el investigador utilizó una metodología práctica y sostenible conocida como "cebolla de investigación", tal y como recomiendan Saunders et al. (2012, 2019). Este método permitió al investigador ir más allá de la fase inicial del estudio, en la que se establecen las preguntas y los procedimientos de recopilación de datos, reconociendo que esta fase sirve de base.

El paradigma de la "cebolla de la investigación" reconoce que las cuestiones mencionadas son sólo la punta del iceberg de la metodología de investigación. Las capas exteriores, que incluyen el enfoque filosófico, el diseño de la investigación, los métodos, la estrategia y el horizonte temporal, son cruciales para determinar la credibilidad y el marco conceptual de la investigación. En lugar de ignorar estas capas, el estudio reconoce su importancia para establecer las bases y la legitimidad de la investigación, ya que proporcionan la estructura dentro de la cual se toman las decisiones relativas a la recogida y el análisis de datos. Esto garantiza que la investigación sea rigurosa y significativa.

Por lo tanto, el presente estudio se basó en un supuesto epistemológico que empleó el positivismo como filosofía de investigación y la deducción como enfoque para evaluar un modelo conceptual mediante pruebas empíricas. El estudio utilizó una metodología cuantitativa y recopiló datos primarios mediante una encuesta a través de Internet. El investigador modificó las escalas de medición utilizadas en estudios anteriores para crear el cuestionario.

El éxito del estudio exigió procedimientos metodológicos rigurosos para el análisis de los datos y la síntesis de los resultados. A este respecto, el estudio utilizó dos técnicas distintas, el análisis factorial exploratorio (AFE) y el análisis factorial confirmatorio (AFC), sobre datos recogidos de pacientes de Jordania.

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Se utilizó el análisis factorial exploratorio (AFE) para explorar la estructura fundamental y las interconexiones entre las variables e identificar componentes o dimensiones latentes dentro del conjunto de datos. Posteriormente, se empleó la técnica del análisis factorial confirmatorio (AFC) para validar el modelo de medición propuesto y evaluar su adecuación a los datos recogidos. La combinación de estos análisis ha reforzado el modelo del estudio y ha aumentado su validez.

Además, el estudio abordó de forma proactiva la cuestión del sesgo del método común (CMB) incorporando el método del marcador CFA en el diseño del cuestionario. Los resultados de este estudio mostraron la ausencia de sesgo de método común (CMB), lo que indica que la técnica de investigación utilizada en el estudio distinguió y evaluó eficazmente los diversos constructos sin introducir ningún sesgo sistemático relacionado con un único método de recogida de datos. En cambio, garantizar la precisión y la calidad de las escalas utilizadas en los análisis posteriores es crucial, y para ello es necesario evaluar la validez y la fiabilidad de un modelo de medición. Para garantizar la validez y fiabilidad del modelo de medición propuesto, este estudio empleó cuatro pruebas, a saber, el Alfa de Cronbach, la Omega de McDonald, la fiabilidad compuesta y la fiabilidad máxima. Los resultados del alfa de Cronbach y la omega de McDonald se situaron dentro de un rango aceptable, lo que indica un alto nivel de fiabilidad. Además, en la fase de AFC se comprobaron la fiabilidad compuesta y la fiabilidad máxima, y los resultados mostraron que todos los constructos del modelo propuesto superaban el nivel aceptable, lo que indicaba un alto nivel de fiabilidad.

También se evaluaron la validez convergente y la validez discriminante del modelo propuesto. El AVE de todos los constructos del modelo superó el nivel aceptable, y la validez discriminante se estableció mediante diversos métodos, como el criterio de Fronell-Larcker y la relación de correlación HTMT. Por lo tanto, los resultados de este estudio indican que el modelo propuesto es fiable y válido, lo que lo convierte en una herramienta eficaz para medir datos. El investigador puede entonces utilizar con confianza este modelo para construir un modelo estructural y probar las hipótesis del estudio.

Como resultado, las conclusiones del estudio apuntan a varios descubrimientos dignos de mención. En primer lugar, los resultados del estudio indican que el valor público de los pacientes comprende cinco valores principales: motivación hedonista, motivación utilitaria, valor social, valor público ético y valor de confianza pública. Estos valores influyen directamente en el comportamiento de uso de la aplicación MyHakeem por parte de los pacientes, que está representado por una variable latente de segundo orden denominada "valor público de los pacientes", con una magnitud del 42,8%.

Además, se observa que los hábitos de uso exhibidos por los pacientes desempeñan un papel mediador en la relación entre el valor público de los pacientes y su comportamiento de utilización, explicando el 20,5% de la varianza. Sin embargo, no se observó el efecto mediador de las intenciones de utilización en la relación mencionada.

En cambio, se ha observado que los factores de estímulo tienen efectos variables sobre los valores de los pacientes. Los resultados indican que únicamente la utilidad percibida tiene un impacto del 40% en la motivación utilitaria, mientras que los beneficios percibidos y la calidad de la prestación de la sanidad electrónica tienen impactos insignificantes en la motivación utilitaria (14% y 1%, respectivamente) y son insignificantes. El estudio reveló que la capacitación de los pacientes es el único factor que influye en su valor social, con un 33% de la varianza.

Por el contrario, se observó que la influencia social no tenía un impacto significativo en el valor social de los pacientes. Además, la aplicación de la justicia en sanidad electrónica tiene un impacto favorable del 17% en los valores éticos de los pacientes. Sin embargo, la utilización

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de la aplicación MyHealth plantea problemas de privacidad, lo que tiene un efecto adverso del - 22% en el valor ético de los pacientes.

Asimismo, los resultados no indican diferencias significativas en la utilización de la aplicación MyHakeem en función del sexo o la edad de los participantes. Esto sugiere que las variables de control, a saber, el sexo y la edad, no moderaron la asociación entre los valores de los pacientes y el uso de la aplicación MyHakeem.

Como se ha mencionado, este estudio integra la teoría del valor público en la investigación sobre la adopción de la sanidad electrónica para ampliar las teorías existentes sobre la adopción de tecnologías. El modelo de tres capas propuesto, basado en el modelo S-O-R, incluye variables de estimulación, valores fundamentales de los pacientes y respuestas de los pacientes, y contribuye a colmar la laguna existente en la investigación. Los resultados validan que el modelo de valores de los pacientes influye significativamente en su utilización y aceptación de las aplicaciones de sanidad electrónica. Se reconoce que la confianza es un factor fundamental que influye en la adopción de la sanidad electrónica y es decisivo para la adopción de la tecnología por parte de los individuos. El modelo utilizado para evaluar la adopción de la sanidad electrónica por parte de los pacientes aporta información valiosa sobre el contexto de adopción de la tecnología sanitaria.

Además, el hábito se identifica como un mediador perfecto en la asociación entre la escala de valores públicos de los pacientes y su utilización y aceptación de la eSalud. En cambio, la intención de implementación no media en esa relación. A pesar de ello, el presente estudio

presenta la intención de implementación como un mediador potencial entre los factores de adopción de la tecnología y el uso real del sistema en lugar de la intención general.

Además, las conclusiones del estudio revelan importantes implicaciones teóricas que arrojan luz sobre las complejidades de la adopción de la sanidad electrónica y las experiencias de los pacientes. Subraya la importancia de desarrollar aplicaciones de sanidad electrónica que sean percibidas como útiles por los pacientes y cumplan sus objetivos utilitarios. Los pacientes que se sienten capacitados e implicados en su proceso de toma de decisiones sanitarias tienen más probabilidades de alcanzar la autoestima y priorizar las conexiones sociales y las relaciones de colaboración en contextos de sanidad electrónica. Además, la preocupación por la privacidad y la justicia de la sanidad electrónica son determinantes significativos de los valores éticos de los pacientes hacia la sanidad electrónica. Las implicaciones del estudio sirven de marco para crear intervenciones y políticas de sanidad electrónica centradas en el paciente que den prioridad a sus necesidades, mejoren sus experiencias y promuevan prácticas sanitarias éticas y socialmente valiosas. En resumen, las implicaciones teóricas de este estudio subrayan la importancia de la utilidad percibida, la capacitación del paciente, la preocupación por la privacidad y la justicia en la sanidad electrónica a la hora de configurar los valores de los pacientes y la adopción de tecnologías de sanidad electrónica. Al igual que las contribuciones teóricas, el presente estudio posee implicaciones prácticas que pueden ayudar a los responsables políticos de los institutos de sanidad pública de Jordania, a los médicos y a los desarrolladores de software a mejorar la aceptación de la aplicación MyHakeem entre los pacientes.

El presente estudio contribuye a la literatura académica y tiene aplicaciones prácticas. Sin embargo, al igual que otros estudios empíricos, tiene limitaciones que los lectores deben tener en cuenta a la hora de interpretar los resultados. En primer lugar, este estudio se centra en una aplicación de sanidad electrónica (MyHakeem) aún en desarrollo. La aplicación debe contener todos los servicios y funciones que necesitan los pacientes. En consecuencia, el impacto real de determinadas variables en los valores de los pacientes sigue sin identificarse. En segundo lugar, esta investigación se sitúa en el marco de la economía emergente de Jordania, que cuenta con una infraestructura sanitaria y digital distinta a la de los países más desarrollados. Por lo tanto,

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hay que ser prudentes a la hora de extrapolar estos resultados a las economías desarrolladas. Por último, el modelo del estudio no incorporó factores relacionados con la infraestructura tecnológica de la sanidad electrónica.

Además, existen varias vías potenciales de investigación futura para explorar la intrincada naturaleza de los valores de los pacientes y su adopción de la tecnología de eSalud. La realización de estudios longitudinales puede aportar información valiosa sobre la sostenibilidad y la eficacia a largo plazo de las iniciativas de sanidad electrónica. La aplicación del modelo del estudio en el entorno de los proveedores de servicios sanitarios y el

análisis del impacto de la adopción de la sanidad electrónica en los resultados sanitarios y la eficiencia del sistema sanitario mejorarían el progreso general y la eficiencia de las iniciativas de sanidad electrónica centradas en el paciente. La adición de determinantes de valor público al modelo ofrecería una comprensión más profunda de las percepciones de valor público y el comportamiento de adopción en diversos sistemas sanitarios y contextos culturales. La integración de la teoría del valor público en los modelos de adopción de tecnología, en particular dentro de la sanidad electrónica y la sanidad 4.0, alinearía estos modelos con los recientes avances tecnológicos.

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RESUMO

Nas últimas décadas, os importantes avances tecnolóxicos tiveron un impacto espectacular en varios aspectos da vida profesional e persoal dos seres humanos. A era actual distínguese por un auxe sen precedentes da revolución dixital, que vira ao redor da utilización da tecnoloxía para aumentar significativamente o alcance e a eficiencia das empresas e as entidades gobernamentais. Este maremoto de innovacións tecnolóxicas, que h converteuse nun auténtico tsunami, remodelou notablemente o sector sanitario (Iyanna et al., 2022) dando lugar ao concepto de sanidade electrónica (Junaid et al., 2022). As tecnoloxías sanitarias electrónicas fan referencia a numerosas innovacións que facilitan a prestación de atención médica e outros servizos sanitarios a través de Internet ou de aplicacións móbiles. Estas innovacións abarcan unha serie de tecnoloxías, como as aplicacións sanitarias móbiles, os servizos de telemedicina baseados na web, as nubes sanitarias, os sistemas de roupa intelixente, os sistemas de historia clínica electrónica (HCE) e a introdución informatizada de ordes de médicos e provedores (CPOE) (Talwar et al., 2023).

A sanidade electrónica, combinada coa IA, a computación na nube, o IoT e os dispositivos wearables, revolucionou a atención sanitaria (Gu et al., 2019). A súa capacidade para abordar os retos da medicina converteuna nun compoñente esencial do sistema sanitario. As historias clínicas electrónicas, por exemplo, axudan a evitar erros no tratamento dos pacientes (dá Fonseca et al., 2021).

En canto á rexión de Oriente Medio, algúns países incorporaron diversas iniciativas de sanidade electrónica, entre eles Xordania (Alanezi, 2021). Con todo, a adopción da tecnoloxía de eSalud segue sendo limitada no mundo árabe, e menos do 12% das institucións sanitarias ofrecen portais electrónicos de pacientes (PEP) como os que xa se implantaron con éxito nalgunhas nacións desenvoltas. Aínda que en Xordania houbo intentos de introducir proxectos de sanidade electrónica de alcance limitado desde 2008 (Murshidi et al., 2022), a noción de sanidade electrónica segue sendo relativamente nova nesta rexión.

En Xordania, a iniciativa nacional de sanidade electrónica, Hakeem (https://ehs.com.jo/hakeem- program), ofrece dúas plataformas principais para pacientes. A primeira plataforma, Hakeem Electronic Services (E-Med), facilita aos pacientes que xa reciben atención médica en calquera dos centros sanitarios automatizados dependentes dos Servizos Médicos Reais de Xordania ou do Ministerio de Sanidade o acceso aos servizos que necesitan por vía electrónica, sen necesidade de acudir persoalmente aos centros sanitarios (EHS, 2022). Esta plataforma comprende tres servizos electrónicos principais: reposición de medicamentos, citas de seguimento e telemedicina.

A segunda plataforma, MyHakeem Mobile Application, é unha plataforma web e unha aplicación móbil que permite aos usuarios acceder e consultar comodamente as súas citas médicas reservadas con antelación, así como a información médica necesaria, como medicamentos activos e pendentes, vacinas recentes, probas de laboratorio pendentes e completas, alerxias, constantes vitais e datos demográficos. Estes datos almacénanse de forma segura na historia clínica electrónica do usuario, rexistrada na institución sanitaria que implanta o programa Hakeem. Esta aplicación tamén permite aos pacientes recibir a súa medicación

mensual sen complicacións, sobre todo se non poden acudir fisicamente ao hospital (EHS, 2022). Más de cinco millóns de historiais de pacientes convertéronse a formato dixital e almacenáronse de forma segura no programa Hakeem desde a súa implantación hai case unha década (Bani-Salameh et al., 2021; Karim et al., 2021).

Aínda que os xordanos teñen unha impresión positiva da telemedicina, a implantación xeneralizada da sanidade electrónica a nivel nacional aínda está lonxe de completarse. Os pacientes móstranse remisos a utilizar as aplicacións de sanidade electrónica por motivos de privacidade, obtención dun diagnóstico correcto e erros médicos (Murshidi et al., 2022; Schreiweis et al., 2019), o que dificulta a súa aceptación (Rahi, 2022).

Pola contra, os investigadores utilizaron varios modelos teóricos para estudar a adopción da tecnoloxía por parte dos usuarios, incluído o UTAUT, que se utilizou en moitos estudos anteriores para comprender a adopción da eSalud por parte dos pacientes (Gu et al., 2021; Momani, 2020; Schreiweis et al., 2019). Con todo, UTAUT foi criticado por ser demasiado simplista e centrarse unicamente nas percepcións individuais dos adoptantes e as intencións xerais de uso, proporcionando pouca información sobre o uso da tecnoloxía (Nguyen, 2022; Shachak et al., 2019).

Kim e os seus colegas (2019) profundaron neste argumento, expondo que unha baixa taxa de adopción pode suxerir que aínda é necesario identificar estratexias óptimas para implementar aplicacións de telemedicina de maneira efectiva. Isto non parece alleo ao feito de que as teorías actuais (como TAM e UTAUT) guían a execución das intervencións de eSalud (Heinsch et al., 2021; Rahi, 2022). En consecuencia, é esencial recoñecer que as tecnoloxías emerxentes como a eSalud teñen múltiples facetas na mente dos usuarios no que respecta a o seu uso. Á súa vez, para que estas tecnoloxías sexan adoptadas, deben aliñarse cos valores e necesidades existentes dos pacientes (Razmak et al., 2018).

Con todo, a bibliografía existente relacionada co valor público, en particular a conceptualización psicolóxica do valor público de Meynhardt, ofrece un marco teórico sólido e un conxunto de ideas claramente definidas que poden empregarse para avaliar as aplicacións de sanidade electrónica desde a perspectiva dos pacientes. A diferenza dos conceptos propostos por Moore e Bozeman, Meynhardt ofrece unha comprensión máis profunda do valor público. Non só establece unha base para o valor público a través dun enfoque relacional dos valores e fundaméntao na base ontológica das necesidades humanas fundamentais, senón que tamén o conecta cun concepto do público que se basea profundamente nas percepcións e comprensións dos individuos. En termos sinxelos, o valor público derívase das necesidades fundamentais, que serven de base para crear valor público (Meynhardt et al., 2017).

Esta percepción, por tanto, ofrece os microfundamentos esenciais e unha conexión teórica co macronivel (Meynhardt & Jasinenko, 2021), explicando como a experiencia e o comportamento humanos emerxen dun conxunto de necesidades básicas que os individuos se esforzan por satisfacer para vivir saludablemente (Epstein, 1998; Meynhardt et al., 2017). Ademais, investigacións anteriores demostraron que é máis probable que os pacientes adopten aplicacións de saúde electrónica que respondan as súas necesidades específicas (Jacob et al., 2022). Con todo, o éxito das tecnoloxías de eSalud tamén depende do ben que se aliñen cos valores e crenzas dos pacientes (Razmak et al., 2018). Por tanto, é esencial desenvolver ferramentas de eSalud adaptadas para satisfacer as necesidades reais dos pacientes sen deixar de ser coherentes cos seus valores e crenzas.

1. Por tanto, este estudo pretende colmar esta lagoa desenvolvendo e validando un modelo de adopción da sanidade electrónica que se centre nos puntos de vista dos pacientes e permita realizar unha investigación cuantitativa mediante enquisas. Este obxectivo xeral desagrégase nos seguintes obxectivos específicos:

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2. Validar o modelo de valor dos pacientes
3. Coñecer os principais valores públicos que teñen os pacientes en Xordania respecto ao uso da iniciativa de sanidade electrónica "MyHakeem".

Coñecer en que medida o modelo de valores dos pacientes #predicir o uso real da tecnoloxía de eSalud con ou sen mediadores entre os pacientes xordanos. Coñecer en que medida os factores de estímulo inherentes a unha app de eSalud inflúen na valoración pública dos pacientes cando utilizan a tecnoloxía de eSalud. Para alcanzar estes obxectivos, o estudo desenvolveu un modelo baseado no marco Estímulo- Organismo-Resposta, que inclúe tres capas. En primeiro lugar, a capa de estímulos engloba os beneficios percibidos, a calidade da prestación de eSalud, a utilidade, a capacitación do paciente, a influencia social, a xustiza en eSalud e a preocupación pola privacidade. A segunda capa, que é a de organismo, inclúe o valor público dos pacientes, que é o valor experimentado polos pacientes no contexto da súa relación co sistema de saúde electrónica, baseado en avaliacións subxectivas relacionadas coas súas necesidades básicas. Pola súa banda, o valor público dos pacientes comprende a motivación hedonista, a motivación utilitaria, o valor social, o valor ético e o valor de confianza. Cando os pacientes adoptan e comparten colectivamente estes cinco valores, convértense en públicos, o que permite a integración de nivélelos micro e macro de adopción nas iniciativas de eSalud. A última capa, os resultados ou respostas das motivacións dos pacientes para utilizar a eSalud, engloba a intención de implantación, o hábito e o uso da eSalud. Ao incorporar estas tres capas, propúxose un total de 15 hipótese para investigar a relación entre os factores de estímulo, as dimensións de valor público dos pacientes e as respostas ás motivacións dos pacientes para utilizar a eSalud; para máis detalles, consulte a Fig. 26 e o Apéndice 14.

Para comprobar as hipóteses, o investigador utilizou unha metodoloxía práctica e sustentable coñecida como "cebola de investigación", tal e como recomendan Saunders et al. (2012, 2019). Este método permitiu ao investigador ir máis aló da fase inicial do estudo, na que se establecen as preguntas e os procedementos de recompilación de datos, recoñecendo que esta fase serve de base.

O paradigma da "cebola da investigación" recoñece que as cuestións mencionadas son só a punta do iceberg da metodoloxía de investigación. As capas exteriores, que inclúen o enfoque filosófico, o deseño da investigación, os métodos, a estratexia e o horizonte temporal, son cruciais para determinar a credibilidade e o marco conceptual da investigación. En lugar de ignorar estas capas, o estudo recoñece a súa importancia para establecer as bases e a lexitimidade da investigación, xa que proporcionan a estrutura dentro da cal se toman as decisións relativas á recollida e a análise de datos. Isto garante que a investigación sexa rigorosa e significativa.

Por tanto, o presente estudo baseouse nun suposto epistemológico que empregou o positivismo como filosofía de investigación e a dedución como enfoque para avaliar un modelo conceptual mediante probas empíricas. O estudo utilizou unha metodoloxía cuantitativa e recompilou datos primarios mediante unha enquisa a través de Internet. O investigador modificou as escalas de medición utilizadas en estudos anteriores para crear o cuestionario.

O éxito do estudo esixiu procedementos metodolóxicos rigorosos para a análise dos datos e a síntese dos resultados. A este respecto, o estudo utilizou dúas técnicas distintas, a análise factorial exploratorio (AFE) e a análise factorial confirmatoria (AFC), sobre datos recolleitos de pacientes de Xordania.

Utilizouse a análise factorial exploratorio (AFE) para explorar a estrutura fundamental e as interconexións entre as variables e identificar compoñentes ou dimensións latentes dentro do conxunto de datos. Posteriormente, empregouse a técnica da análise factorial confirmatoria (AFC) para validar o modelo de medición proposto e avaliar a súa adecuación aos datos

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recolleitos. A combinación destas análises reforzou o modelo do estudo e aumentou a súa validez.

Ademais, o estudo abordou de forma proactiva a cuestión do rumbo do método común (CMB) incorporando o método do marcador CFA no deseño do cuestionario. Os resultados deste estudo mostraron a ausencia de rumbo de método común (CMB), o que indica que a técnica de investigación utilizada no estudo distinguiu e avaliou eficazmente os diversos constructos sen introducir ningún rumbo sistemático relacionado cun único método de recollida de datos. En cambio, garantir a precisión e a calidade das escalas utilizadas nas análise posteriores é crucial, e para iso é necesario avaliar a validez e a fiabilidade dun modelo de medición. Para garantir a validez e fiabilidade do modelo de medición proposto, este estudo empregou catro probas, a saber, o Alfa de Cronbach, a Omega de McDonald, a fiabilidade composta e a fiabilidade máxima. Os resultados do alfa de Cronbach e a omega de McDonald situáronse dentro dun rango aceptable, o que indica un alto nivel de fiabilidade. Ademais, na fase de AFC comprobáronse a fiabilidade composta e a fiabilidade máxima, e os resultados mostraron que todos os constructos do modelo proposto superaban o nivel aceptable, o que indicaba un alto nivel de fiabilidade.

Tamén se avaliaron a validez converxente e a validez discriminante do modelo proposto. O AVE de todos os constructos do modelo superou o nivel aceptable, e a validez discriminante estableceuse mediante diversos métodos, como o criterio de Fronell-Larcker e a relación de correlación HTMT. Por tanto, os resultados deste estudo indican que o modelo proposto é fiable e válido, o que o converte nunha ferramenta eficaz para medir datos. O investigador pode entón utilizar con confianza este modelo para construír un modelo estrutural e probar as hipóteses do estudo.

Como resultado, as conclusións do estudo apuntan a varios descubrimentos dignos de mención. En primeiro lugar, os resultados do estudo indican que o valor público dos pacientes comprende cinco valores principais: motivación hedonista, motivación utilitaria, valor social, valor público ético e valor de confianza pública. Estes valores inflúen directamente no comportamento de uso da aplicación MyHakeem por parte dos pacientes, que está representado por unha variable latente de segundo @orden denominada "valor público dos pacientes", cunha magnitude do 42,8%.

Ademais, obsérvase que os hábitos de uso exhibidos polos pacientes desempeñan un papel mediador na relación entre o valor público dos pacientes e o seu comportamento de utilización, explicando o 20,5% da varianza. Con todo, non se observou o efecto mediador das intencións de utilización na relación mencionada.

En cambio, observouse que os factores de estímulo teñen efectos variables sobre os valores dos pacientes. Os resultados indican que unicamente a utilidade percibida ten un impacto do 40% na motivación utilitaria, mentres que os beneficios percibidos e a calidade da prestación da sanidade electrónica teñen impactos insignificantes na motivación utilitaria (14% e 1%, respectivamente) e son insignificantes. O estudo revelou que a capacitación dos pacientes é o único factor que inflúe no seu valor social, cun 33% da varianza.

Pola contra, observouse que a influencia social non tiña un impacto significativo no valor social dos pacientes. Ademais, a aplicación da xustiza en sanidade electrónica ten un impacto favorable do 17% nos valores éticos dos pacientes. Con todo, a utilización da aplicación MyHealth expón problemas de privacidade, o que ten un efecto adverso do - 22% no valor ético dos pacientes.

Así mesmo, os resultados non indican diferenzas significativas na utilización da aplicación MyHakeem en función do sexo ou a idade dos participantes. Isto suxire que as variables de

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control, a saber, o sexo e a idade, non moderaron a asociación entre os valores dos pacientes e o uso da aplicación MyHakeem.

Como se mencionou, este estudo integra a teoría do valor público na investigación sobre a adopción da sanidade electrónica para ampliar as teorías existentes sobre a adopción de tecnoloxías. O modelo de tres capas proposto, baseado no modelo S-Ou-R, inclúe variables de estimulación, valores fundamentais dos pacientes e respostas dos pacientes, e contribúe a colmar a lagoa existente na investigación. Os resultados validan que o modelo de valores dos pacientes inflúe significativamente na súa utilización e aceptación das aplicacións de sanidade electrónica. Recoñécese que a confianza é un factor fundamental que inflúe na adopción da sanidade electrónica e é decisivo para a adopción da tecnoloxía por parte dos individuos. O modelo utilizado para avaliar a adopción da sanidade electrónica por parte dos pacientes achega información valiosa sobre o contexto de adopción da tecnoloxía sanitaria.

Ademais, o hábito identifícase como un mediador perfecto na asociación entre a escala de valores públicos dos pacientes e a súa utilización e aceptación da eSalud. En cambio, a intención de implementación non media nesa relación. A pesar diso, o presente estudo

presenta a intención de implementación como un mediador potencial entre os factores de adopción da tecnoloxía e o uso real do sistema en lugar da intención xeral.

Ademais, as conclusións do estudo revelan importantes implicacións teóricas que arroxan luz sobre as complexidades da adopción da sanidade electrónica e as experiencias dos pacientes. Subliña a importancia de desenvolver aplicacións de sanidade electrónica que sexan percibidas como útiles polos pacientes e cumpran os seus obxectivos utilitarios. Os pacientes que senten capacitados e implicados no seu proceso de toma de decisións sanitarias teñen máis probabilidades de alcanzar a autoestima e priorizar as conexións sociais e as relacións de colaboración en contextos de sanidade electrónica. Ademais, a preocupación pola privacidade e a xustiza da sanidade electrónica son determinantes significativos dos valores éticos dos pacientes cara á sanidade electrónica. As implicacións do estudo serven de marco para crear intervencións e políticas de sanidade electrónica centradas no paciente que dean prioridade ás súas necesidades, melloren as súas experiencias e promovan prácticas sanitarias éticas e socialmente valiosas. En resumo, as implicacións teóricas deste estudo subliñan a importancia da utilidade percibida, a capacitación do paciente, a preocupación pola privacidade e a xustiza na sanidade electrónica á hora de configurar os valores dos pacientes e a adopción de tecnoloxías de sanidade electrónica. Do mesmo xeito que as contribucións teóricas, o presente estudo posúe implicacións prácticas que poden axudar aos responsables políticos dos institutos de sanidade pública de Xordania, aos médicos e aos desarrolladores de software a mellorar a aceptación da aplicación MyHakeem entre os pacientes.

O presente estudo contribúe á literatura académica e ten aplicacións prácticas. Con todo, do mesmo xeito que outros estudos empíricos, ten limitacións que os lectores deben ter en conta á hora de interpretar os resultados. En primeiro lugar, este estudo céntrase nunha aplicación de sanidade electrónica (MyHakeem) aínda en desenvolvemento. A aplicación debe conter todos os servizos e funcións que necesitan os pacientes. En consecuencia, o impacto real de determinadas variables nos valores dos pacientes segue sen identificarse. En segundo lugar, esta investigación sitúase no marco da economía emerxente de Xordania, que conta cunha infraestrutura sanitaria e dixital distinta á dos países máis desenvoltos. Por tanto, hai que ser prudentes á hora de extrapolar estes resultados ás economías desenvoltas. Por último, o modelo do estudo non incorporou factores relacionados coa infraestrutura tecnolóxica da sanidade electrónica.

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Ademais, existen varias vías potenciais de investigación futura para explorar a intrincada natureza dos valores dos pacientes e a súa adopción da tecnoloxía de eSalud. A realización de

estudos lonxitudinais pode achegar información valiosa sobre a sustentabilidade e a eficacia a longo prazo das iniciativas de sanidade electrónica. A aplicación do modelo do estudo na contorna dos provedores de servizos sanitarios e a análise do impacto da adopción da sanidade electrónica nos resultados sanitarios e a eficiencia do sistema sanitario mellorarían o progreso xeral e a eficiencia das iniciativas de sanidade electrónica centradas no paciente. A adición de determinantes de valor público ao modelo ofrecería unha comprensión máis profunda das percepcións de valor público e o comportamento de adopción en diversos sistemas sanitarios e contextos culturais. A integración da teoría do valor público nos modelos de adopción de tecnoloxía, en particular dentro da sanidade electrónica e a sanidade 4.0, aliñaría estes modelos cos recentes avances tecnolóxicos

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SUMMARY

In the last decades, significant technological advancements have dramatically impacted several aspects of humans' professional and personal lives. The present era is distinguished by an unprecedented surge in the digital revolution, which revolves around utilizing technology to significantly augment the reach and efficiency of businesses and governmental entities. This tidal wave of technological innovations, which has turned into a real tsunami, has notably reshaped the healthcare industry (Iyanna et al., 2022), giving rise to the concept of eHealth (Junaid et al., 2022). Electronic health technologies refer to numerous innovations that facilitate the delivery of medical care and other healthcare services through the Internet or mobile apps. These innovations encompass a range of technologies, such as mobile health applications, web-based telemedicine services, health clouds, intelligent clothing systems, electronic medical record (EMR) systems, and computerized physician/provider order entry (CPOE) (Talwar et al., 2023).

eHealth, combined with AI, cloud computing, IoT, and wearable devices, has revolutionized healthcare (Gu et al., 2019). Its ability to address challenges in medicine has made it an essential component of the healthcare system. Electronic medical records, for instance, help avoid mistakes in the treatment of patients (da Fonseca et al., 2021).

Regarding the Middle East region, some countries have incorporated various eHealth initiatives, including Jordan (Alanezi, 2021). However, the adoption of eHealth technology is still limited in the Arab world, with less than 12% of healthcare institutions offering electronic patient portals (EPP) like those already successfully implemented in some developed nations. While there have been attempts to introduce limited-reach eHealth projects in Jordan since 2008 (Murshidi et al., 2022), the notion of eHealth is still relatively new in this region.

In Jordan, the national eHealth initiative, Hakeem (https://ehs.com.jo/hakeem-program), offers two primary patient platforms. The first platform, Hakeem Electronic Services (E-Med), facilitates patients who are already receiving medical care from any of the automated health facilities under the Jordanian Royal Medical Services or the Ministry of Health to access the services they require electronically, without the need to visit the health facilities in person (EHS, 2022). This platform comprises three primary electronic services: medication refills, follow-up appointments, and telemedicine.

The second platform, MyHakeem Mobile Application, is a web-based platform and mobile app that allows users to conveniently access and view their pre-booked medical appointments, as well as necessary medical information such as active and pending medications, recent immunizations, pending and complete laboratory tests, allergies, vital signs, and demographic data. These data are securely stored on the user's electronic health record, registered within the healthcare institution that implements the Hakeem program. This application also provides a hassle-free way for patients to have their monthly medications delivered to them, especially if they cannot physically go to the hospital (EHS, 2022). Over five million patients' records have been converted to digital form and securely stored in the Hakeem program since its implementation nearly a decade ago (Bani-Salameh et al., 2021; Karim et al., 2021).

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While Jordanians have positive impressions of telemedicine, the widespread implementation of eHealth at the national level is still far from complete. Patients express reluctance to use eHealth apps due to privacy concerns, getting a correct diagnosis, and dealing with medical errors (Murshidi et al., 2022; Schreiweis et al., 2019), which hinders their acceptance (Rahi, 2022).

In contrast, researchers have used various theoretical models to study user adoption of technology, including the UTAUT, which has been utilized in many prior studies to understand patients' eHealth adoption (Gu et al., 2021; Momani, 2020; Schreiweis et al., 2019). However, UTAUT has been criticized for being overly simplistic and focusing solely on individual adopters' perceptions and general usage intentions, providing little insight into technology usage (Nguyen, 2022; Shachak et al., 2019).

Kim and his colleagues (2019) have furthered this argument, positing that a low adoption rate may suggest that optimal strategies still need to be identified to implement telemedicine applications effectively. That does not seem unrelated to the fact that current theories (like TAM and UTAUT) guide the execution of eHealth interventions (Heinsch et al., 2021; Rahi, 2022). As a result, it is essential to recognize that emerging technologies like eHealth are multifaceted in users' minds regarding their usage. In turn, for these technologies to be adopted, they must align with patients' existing values and needs (Razmak et al., 2018).

Nonetheless, the existing body of literature related to public value, particularly Meynhardt's psychological public value conceptualization, offers a robust theoretical framework and a clearly defined set of ideas that can be employed to evaluate eHealth applications from the perspective of patients. In contrast to the concepts proposed by Moore and Bozeman, Meynhardt offers a more profound comprehension of public value. He not only establishes a foundation for public value through a relational approach to values and grounds it in the ontological basis of fundamental human needs but also connects it to a concept of the public that is deeply based on individuals' perceptions and understandings. In simple terms, public value is derived from fundamental needs, which serve as the foundation for creating public value (Meynhardt et al., 2017).

This perception, thus, offers the essential micro-foundations and a theoretical connection to the macro-level (Meynhardt & Jasinenko, 2021), explaining how the human experience and behavior emerge from a set of basic needs that individuals strive to fulfill in order to live healthily (Epstein, 1998; Meynhardt et al., 2017).

In addition, previous research has shown that patients are more likely to adopt eHealth apps that address their specific needs (Jacob et al., 2022). However, the success of eHealth technologies also depends on how well they align with patients' values and beliefs (Razmak et al., 2018). Therefore, it is essential to develop eHealth tools tailored to meet patients' actual needs while remaining consistent with their values and beliefs.

Therefore, this study aims to address this gap by developing and validating an eHealth adoption model that focuses on patients' viewpoints and enables quantitative survey research. This overarching goal is broken down into the following specific objectives:

1. Validate patients' value model
2. Knowing the primary public values patients hold in Jordan regarding using the eHealth initiative "MyHakeem."
3. Knowing to what extent the patients' value model predicts the actual usage of eHealth technology with or without mediators among Jordanian patients
4. Knowing to what extent the stimulus factors inherent in an eHealth app influence patients' public value when using eHealth technology

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To achieve these aims, the study developed a model based on the Stimulus-Organism-Response framework, which includes three layers. Initially, the stimuli layer encompasses perceived benefits, quality of eHealth delivery, usefulness, patient empowerment, social influence, eHealth justice, and privacy concerns. The second layer, which is Organism, includes Patients' public value, which is the value experienced by patients in the context of their relationship with the eHealth system, based on subjective evaluations related to their basic needs. Meanwhile, patients' public value comprises hedonistic motivation, utilitarian motivation, social value, ethical value, and trust value. When patients collectively adopt and share these five values, they become public, enabling the integration of both micro- and macro-levels of adoption in eHealth initiatives. The last layer, the outcomes or responses of patients' motivations to utilize eHealth, encompasses implementation intention, habit, and eHealth use. By incorporating these three layers, a total of 15 hypotheses have been proposed to investigate the relationship between stimuli factors, patients' public value dimensions, and responses to patients' motivations to utilize eHealth; please refer to Fig. 26 and Appendix 14 for further details.

To test hypotheses, the researcher utilized a practical and sustainable methodology known as the "research onion," as recommended by Saunders et al. (2012, 2019). This method enabled the researcher to move beyond the initial stage of the study, where questions and data collection procedures are established, recognizing that this stage serves as a foundation.

The "research onion" paradigm acknowledges that the abovementioned issues are just the tip of the iceberg in research methodology. The outer layers, which include the philosophical approach, research design, methods, strategy, and time horizon, are crucial in determining the credibility and conceptual framework of the research. Rather than ignoring these layers, the study recognizes their importance in establishing the groundwork and legitimacy of the research, as they provide the structure within which decisions regarding data collection and analysis are made. This ensures that the research is rigorous and meaningful.

Therefore, the present study was grounded in an epistemological assumption that employed positivism as the research philosophy and deduction as an approach for evaluating a conceptual model through empirical evidence. The study used a quantitative methodology and gathered primary data through a web-based survey. The researcher modified the measurement scales used in previous studies to create the questionnaire.

The study's successful completion required rigorous methodological procedures for data analysis and result synthesis. In this regard, the study utilized two distinct techniques, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), on data collected from patients in Jordan.

Exploratory factor analysis (EFA) was used to explore the fundamental structure and interconnections among the variables and to identify latent components or dimensions within the dataset. Subsequently, the Confirmatory Factor Analysis (CFA) technique was employed to validate the proposed measurement model and assess its suitability with the collected data. Combining these analyses has strengthened the study's model and enhanced its validity.

Furthermore, the study proactively addressed the issue of common method bias (CMB) by incorporating the CFA marker method into the questionnaire design. The results of this study showed the absence of common method bias (CMB), indicating that the research technique used in the study effectively distinguished and assessed the various constructs without introducing any systematic bias related to a single data collection method.

In contrast, ensuring the accuracy and quality of scales used in subsequent analyses is crucial, and this requires assessing the validity and reliability of a measurement model. To ensure the proposed measurement model's validity and reliability, this study employed four

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tests, namely Cronbach's Alpha, McDonald's Omega, composite reliability, and maximal reliability. The results of Cronbach's Alpha and McDonald's Omega fell within an acceptable range, indicating a high level of reliability. Additionally, composite reliability and maximal reliability were tested during the CFA stage, and the results showed that all the constructs of the proposed model exceeded the acceptable level, indicating high reliability.

The proposed model's convergent validity and discriminant validity were also evaluated. The AVE for all model constructs exceeded the acceptable level, and the discriminant validity was established through various methods, such as the Fronell-Larcker criterion and the HTMT ratio of correlation. Therefore, this study's findings indicate that the proposed model is both reliable and valid, making it an effective tool for measuring data. The researcher can then confidently use this model to build a structural model and test the study's hypotheses.

As a result, the study's findings point to several noteworthy discoveries. Initially, the study findings indicate that patients' public value comprises five primary values: hedonistic motivation, utilitarian motivation, social value, ethical public value, and public trust value. These values directly influence patients' use behavior of the MyHakeem app, which is represented by a second-order latent variable called "patients' public value," with a magnitude of 42.8%.

Moreover, it can be observed that the habits of use exhibited by patients play a mediating role in the relationship between the public value of patients and their utilization behavior, accounting for 20.5% of the variance. However, the mediating effect of implementation intentions on the relationship mentioned above was not observed.

In contrast, it has been observed that stimulus factors have varying effects on patients' values. The findings indicate that solely perceived usefulness has a 40% impact on utilitarian motivation, whereas perceived benefits and quality of eHealth delivery have negligible impacts on utilitarian motivation (14% and 1%, respectively) and are insignificant. The study revealed that patients' empowerment is the sole factor influencing their social value, accounting for 33% of the variance.

Conversely, social influence was found to have no significant impact on patients' social value. Furthermore, implementing eHealth justice has a favorable impact of 17% on patients' ethical values. However, utilizing the MyHealth application raises privacy concerns, which has an adverse effect of -22% on patients' ethical value.

Also, the findings indicate no significant difference in the utilization of the MyHakeem application based on the gender or age of the participants. This suggests that the control variables, namely gender and age, did not moderate the association between patients' values and the MyHakeem app's use.

As mentioned, this study integrates public value theory in eHealth adoption research to expand the existing technology adoption theories. The proposed three-layered model, based on the S-O-R Model, includes stimulation variables, patients' core values, and patients' responses and helps to bridge the research gap. The findings validate that the patients' value model significantly influences their utilization and acceptance of eHealth apps. Trust is recognized as a foundational factor influencing eHealth adoption and critical in shaping individuals' technology adoption. The model used to evaluate eHealth adoption by patients provides valuable insights into the healthcare technology adoption context.

Additionally, habit is identified as a perfect mediator in the association between patients' public value scale and their utilization and acceptance of eHealth. In contrast, implementation intention does not mediate in that relationship. Despite that, the current study presents implementation intention as a potential mediator between technology adoption factors and actual use of the system instead of general intention.

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Furthermore, the study's findings reveal significant theoretical implications that shed light on the complexities of eHealth adoption and patient experiences. It underscores the importance of developing eHealth apps that are perceived to be useful by patients and meet their utilitarian objectives. Patients who feel empowered and involved in their healthcare decision-making process are more likely to achieve self-esteem and prioritize social connections and collaborative relationships within eHealth contexts. Additionally, privacy concerns and eHealth justice are significant determinants of patients' ethical values toward eHealth. The study's implications serve as a framework for creating patient-centric eHealth interventions and policies that prioritize patients' needs, improve their experiences, and promote ethical and socially valuable healthcare practices. In sum up, the theoretical implications of this study emphasize the significance of perceived usefulness, patient empowerment, privacy concerns, and eHealth justice in shaping patients' values and adoption of eHealth technologies. Similar to the theoretical contributions, the current study possesses practical implications that can aid policymakers in Jordan's public healthcare institutes, medical practitioners, and software developers in enhancing the acceptance of the MyHakeem application among patients.

Current study contributes to the academic literature and has practical applications. However, like other empirical studies, it has limitations that readers should keep in mind when interpreting the results. Firstly, this study focused on an eHealth app (MyHakeem) still in development. The app needs to contain all the services and features that patients require. As a result, the actual impact of certain variables on patient values remains unidentified. Secondly, this research is situated within the framework of Jordan's emerging economy, which has distinct health and digital infrastructure compared to more developed countries. Therefore, caution should be exercised in extrapolating these results to developed economies. Lastly, the study model did not incorporate factors related to eHealth technology infrastructure.

Furthermore, there are several potential avenues for future research to explore the intricate nature of patients' values and their adoption of eHealth technology. Conducting longitudinal studies can provide valuable insights into eHealth initiatives' long-term sustainability and effectiveness. Applying the study's model within the healthcare provider setting and analyzing the impact of eHealth adoption on health outcomes and the efficiency of the healthcare system would enhance the overall progress and efficiency of patient-centered eHealth initiatives. Adding public value determinants to the model would offer a deeper understanding of public value perceptions and adoption behavior in diverse healthcare systems and cultural contexts. Integrating public value theory into technology adoption models, particularly within eHealth and Healthcare 4.0, would align these models with recent technological advancements.

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1. INTRODUCTION

> All sciences are now under the obligation to prepare the ground for the future task of the philosopher, which is to solve the problem of value, to determine the true hierarchy of values. Friedrich Nietzsche

1.1. BACKGROUND

Over the past few decades, technological advancements have significantly changed many aspects of our personal and professional lives. The current era is marked by an unprecedented surge in the digital revolution, where technology is used to enhance the reach and efficiency of businesses and governments (Iyanna et al., 2022).

This wave of technological innovations, which has become a real tsunami in recent years, has significantly impacted the healthcare industry (ibid), leading to the emergence of eHealth (Iyanna et al., 2022; Junaid et al., 2022). eHealth, which stands for electronic health, refers to numerous innovations that facilitate the delivery of medical care and other healthcare services through the Internet or mobile apps. These innovations encompass a range of technologies such as mobile health applications (mHealth apps), web-based telemedicine services, health clouds, smart clothing systems, information technology-based assistive technology services, electronic medical record (EMR) systems, clinical decision support systems (CDSSs), RFID applications in managing various forms of healthcare, and computerized physician/provider order entry (CPOE) (Talwar et al., 2023).

The fusion of eHealth and new information technologies such as AI, cloud computing, the Internet of Things (IoT), and wearable devices, on the other hand, has been a watershed event in healthcare, highlighting its critical importance in our ever-evolving world (Gu et al., 2019). EHealth has become an essential component of the healthcare system due to its ability to handle various challenges in medicine, such as lowering the rate of medical errors and increasing the effectiveness and efficiency of service delivery. For instance, using electronic medical records, in which a patient's medical history is recorded, helps avoid mistakes in their treatment, such as giving them the wrong drug (da Fonseca et al., 2021).

Although eHealth applications offer many advantages, patients still hesitate to accept them as a form of medical treatment. Bullock et al. (2017) have emphasized that the global adoption of eHealth applications is currently delayed. This argument has been furthered by Kim et al. (2019), who suggest that a low adoption rate may indicate a need to identify optimal strategies to implement telemedicine applications effectively (Rahi, 2022).

Moreover, the current theories guiding eHealth interventions, such as UTAUT and TAM, mainly focus on the individual's readiness to accept health technologies and fail to capture the complex and interrelated relationships and structures necessary for implementing sustainable change. To address the acknowledged complexity of eHealth implementation, it is recommended that future research endeavors focus on constructing and evaluating models that acknowledge and represent the multidimensional, dynamic, and interdependent nature of eHealth apps (Heinsch et al., 2022).

Nonetheless, the existing body of literature related to public value, particularly Meynhardt's psychological public value conceptualization, offers a robust theoretical framework and a clearly defined set of ideas that can be employed to evaluate eHealth

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applications from the perspective of patients. In contrast to the concepts proposed by Moore and Bozeman, Meynhardt offers a more profound comprehension of public value. He not only establishes a foundation for public value through a relational approach to values and grounds it in the ontological basis of fundamental human needs but also connects it to a concept of the public that is deeply based on individuals' perceptions and understandings. In simple terms, public value is derived from fundamental needs, which serve as the foundation for creating public value (Meynhardt et al., 2017).

This perception, thus, offers the essential micro-foundations and a theoretical connection to the macro-level (Meynhardt & Jasinenko, 2021), explaining how the human experience and behavior emerge from a set of basic needs that individuals strive to fulfill in order to live healthily (Epstein, 1998; Meynhardt et al., 2017).

In addition, previous research has shown that patients are more likely to adopt eHealth apps that address their specific needs (Jacob et al., 2022). However, the success of eHealth technologies also depends on how well they align with patients' values and beliefs (Razmak et al., 2018). Therefore, it is essential to develop eHealth tools tailored to meet patients' actual needs while remaining consistent with their values and beliefs.

Accordingly, the evaluation of eHealth in this research is conducted using a novel model (refer to Figure 26) that integrates the concepts and dimensions of public value and technology adoption within the Stimulus-Organism-Response (S-O-R) framework to understand the relationship between stimuli associated with eHealth features and benefits and their impact on patients' public value dimensions and subsequent behaviors.

1.2. STUDY PROBLEM

For several years, the notion of eHealth, which involves utilizing electronic communication and information technologies to enhance healthcare, has been gaining traction and capturing attention (Nguyen, 2022). eHealth offers many advantages to patients, healthcare providers, and society, such as reducing the frequency of hospitalizations or readmissions, curbing overall healthcare expenditures, and shortening hospital stays. Furthermore, it has been suggested that implementing eHealth may confer psychological benefits upon patients, such as heightened satisfaction levels and improved drug adherence (Giacalone et al., 2022)

In Jordan, the Hakeem program has been implemented to improve healthcare delivery through electronic health systems. It has been almost a decade since the program was introduced as part of Jordan's electronic society implementation, and it has so far digitized and stored over five million patient records (Bani-Salameh et al., 2021; Karim et al., 2021).

However, the extent of patients' adoption and utilization of eHealth services is still unclear, as eHealth services are often not adopted due to the lack of user acceptance (Schreiweis et al., 2019). Moreover, the national implementation of eHealth in Jordan is still incomplete, and patients are concerned about their privacy, getting accurate diagnoses, and dealing with medical errors (Murshidi et al., 2022).

Additionally, there is a need for more information about the barriers associated with using eHealth apps among Jordanian patients (Qan’ir et al., 2021).

Moreover, several studies indicate a certain degree of reluctance among patients to accept medical treatments through eHealth applications, and the global adoption of eHealth applications is currently experiencing a delay (Rahi, 2022).

To tackle this issue, numerous theoretical models have been employed by researchers to study user adoption of technology. Among them is the UTAUT, which is a unique and well-known instrument that has been utilized in a large number of prior studies to understand the ability of users to accept technology and their intention to adopt new technologies, particularly in patients' adoption of eHealth (D. Gu et al., 2021; Momani, 2020; Schreiweis et al., 2019).

However, UTAUT has received criticism for overly simplistic and solely focusing on individual adopters' perceptions, and general usage intentions. Additionally, the thousands of studies that have employed these theories have not contributed significantly to the body of knowledge, as their contribution has plateaued (Shachak et al., 2019). It takes a narrow perspective by focusing on only a few factors, thus providing little insight into actual IT usage (Nguyen, 2022).

Kim and his colleagues have furthered this argument, positing that a low adoption rate may suggest that optimal strategies still need to be identified to implement telemedicine applications effectively (Rahi, 2022). This is because the current theories guiding eHealth interventions, such as UTAUT and TAM, primarily focus on the individual's readiness to accept health technologies. The eHealth literature requires more theoretical perspectives to effectively capture the complex and interrelated relationships and structures required to implement sustainable change. Considering the increasing complexity of eHealth implementation, it is recommended that future research endeavors concentrate on creating and evaluating models that recognize and represent the multidimensional, dynamic, and interdependent nature of eHealth apps (Heinsch et al., 2021).

To overcome these barriers to eHealth adoption, Shachak and colleagues propose that future research on the implementation and use of health information technology should shift away from current theories such as UTAUT toward a multifaceted approach that addresses the sophistication of factors affecting technology implementation and use in healthcare (Addotey-Delove et al., 2022; Shachak et al., 2019). In addition, earlier research, notably those on mobile technologies like mHealth, has focused on the impact of total value on outcomes, including intention, engagement, technology uptake, and usage.

However, understanding perceived value as a unidimensional concept may be overly basic and not reflect the intricate interactions between distinct value dimensions and behavior. Sweeney and Soutar found that a multidimensional value construct (emotional, social, technical, and value for money) better explains consumer behavior (Ashraf et al., 2021).

On the other hand, researchers believe that citizens are the primary stakeholders determining public value while simultaneously getting e-services. By its very nature, we recognize that citizen viewpoint is an essential factor that should be incorporated into the public value idea.

In addition, intelligent technologies play a unique role in the interaction between government and citizens by establishing the setting for developing public value and facilitating the co-creation of public services. In the post-NPM era, however, there is a dearth of research analyzing the significant drivers of public value generation (Lopes et al., 2019), especially in the context of developing countries (Twizeyimana & Andersson, 2019).

Also, Gerli et al. (2021) suggested that public value provides a robust framework for analyzing e-government services such as eHealth. However, comprehending the intricate connections between the diverse dimensions of public value in healthcare delivery takes time and effort. Further empirical and theoretical exploration is necessary to determine how eHealth applications can support the public while safeguarding individual users' and marginalized groups' rights and welfare. The key research questions are, therefore, the following:

1. Based on the patients' value model, what factors influence eHealth technology adoption in the Jordan healthcare system?
2. What do patients in Jordan hold the primary public values about eHealth?
3. To what extent does the patients' value model predict the actual usage of eHealth technology among Jordanian patients?
4. To what extent do the stimulus factors inherent in an eHealth app influence patients' public value when using eHealth technology?

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1.3. STUDY OBJECTIVES

Research on eHealth in Jordan is scarce, leaving untapped potential in this (Alkhwaldi, 2022; Jalghoum et al., 2021). Previous studies have primarily focused on the benefits of eHealth for health service providers and the technological and infrastructure obstacles to its implementation (see, Alsharo et al., 2020, 2021; Karim et al., 2021; Nassar et al., 2017; Sulaiman & Magaireah, 2014), rather than on the factors that motivate patients to adopt eHealth and investigate patients' public values when adopting an eHealth initiative.

Therefore, this study aims to address this gap by developing and validating an eHealth adoption model that focuses on patients' viewpoints and enables quantitative survey research. This overarching goal is broken down into the following specific objectives:

1. Validate patients' value model
2. Knowing the primary public values patients hold in Jordan regarding using the eHealth initiative "MyHakeem."
3. Knowing to what extent the patients' value model predicts the actual usage of eHealth technology with or without mediators among Jordanian patients
4. Knowing to what extent the stimulus factors inherent in an eHealth app influence patients' public value when using eHealth technology

1.4. STUDY SIGNIFICANCE

This research project aims to significantly contribute to the existing body of knowledge on eHealth by addressing the gaps in current theories, particularly the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM). The study also seeks to advance our understanding of the potential of eHealth initiatives in Jordan and explore the various factors that influence patients' decisions to adopt eHealth technologies.

In addition to the theoretical contributions, this study will provide practical implications that could benefit policymakers, medical practitioners, and software developers in Jordanian public healthcare. The main focus of this research is to improve the acceptance of the MyHakeem application among patients. The study will examine the different factors that impact the acceptance of eHealth technologies among patients, including their attitudes toward technology, perceived usefulness, perceived ease of use, and trust in the technology.

Furthermore, this research project will investigate the potential of the MyHakeem application to enhance the quality of healthcare services and improve patient outcomes. The study will also explore the potential barriers to patients' adoption of eHealth technologies and provide recommendations to overcome these barriers. Overall, this study aims to provide valuable insights into the potential of eHealth initiatives in Jordan and contribute to developing effective strategies to promote the adoption of eHealth technologies among patients.

1.5. STRUCTURAL OUTLINE

The structure of the thesis is determined by the School of International Doctorate of USC's recommendations. The thesis is divided into six interrelated chapters. The following describes the contents of each chapter in this thesis:

Chapter One: is the first chapter of the thesis and introduces the background to the study, study problem, study objectives, study significance, and structural outline. Chapter Two: examines the literature on the emergence of eHealth technology, specifically about patients' acceptance of these novel technologies. This chapter dives into the theoretical framework surrounding the concept of value, with a specific focus on public value. Additionally, it examines the role of values in motivating patients to adopt eHealth technology. This chapter also examines the current frameworks established for evaluating the adoption of eHealth, considering each of their advantages and limitations. Finally, it generates and proposes

a theoretical framework for evaluating eHealth technology adoption in the Jordanian healthcare system and the study assumptions. Chapter Three: focuses on the methodology employed for this study. It starts by illustrating the research design and then discusses the philosophical viewpoints used, focusing on the quantitative method approach underpinning this study. The research design and questionnaire administration are described in detail, as well as the quantitative method strategy employed in this study. This chapter also discusses the population and sampling of the study, the measurement model, statistical reliability and validity, common method biases, and ethical considerations. Chapter Four: This chapter presents the findings of the structural model testing and the hypotheses, along with examining the mediating role of habit and implementation intention variables. Chapter Five: This chapter offers a comprehensive summary of the findings collected in Chapter four and offers an in-depth examination and discussion of these results. Moreover, this chapter presents the theoretical and practical implications of the study's findings. Chapter Six: concludes the study and provides an overview of the findings regarding the research objectives, recommendations, limitations, and future research suggestions.

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2. LITERATURE REVIEW

In this chapter, a comprehensive literature review will be conducted, covering a range of sources on values, public value theory, and acceptance technology models, including UTAUT and eHealth literature. This will establish the theoretical foundation for the study model, which will culminate in the presentation of the study hypotheses.

2.1. VALUE(S)/PUBLIC

In human society, social science, and philosophy, value is a crucial but ambiguous and contentious concept and phenomenon. As a part of everyday life, we'll talk about the value of things like a cup of coffee, a car, a house, or even life. It's natural to wonder why some people do what they do or why some organizations and governments do what they do, and whether or not these things have value or are worthless. We may use the phrase "your value, but not my value" in order to convey the idea that people's values are subjectively evaluated. Almost all of our actions and social phenomena can be linked to concepts of appraisal and value (B. Wang, 2022).

as Scott observed that "the study of values is central to and involves the intersection of interests of philosophers, anthropologists, sociologists, and psychologists," and Rokeach argued that it should "occupy a central position... capable of uniting the apparently diverse interests of all the sciences concerned with human behavior."(Racko, 2019) Also, values are utilized to characterize cultural groups, societies, and individuals, to track change across time, and to explain the motivating underpinnings of attitudes, and behavior (Schwartz, 2012).

The literature on values is vast and interdisciplinary, with numerous philosophical viewpoints presented, for instance, in social psychology. Value concepts and constructions are of relevance to many different fields, therefore theoretical convergence is unusual. As a result, social psychologists like Schwartz, Maio & Olson; Torelli & Kaikati; Allport, often consider attitudes from the perspective of the cognitive origins of values, with many recalling Rokeach's classic characterization of values as " an enduring belief that a specific mode of conduct or end state of existence is personally or socially preferable to an opposite or converse mode of conduct or end state of existence "(Bozeman, 2019; Farcane et al., 2019).

Conversely, many philosophers place more emphasis on consequentialism (also known as moral realism), the belief that appraisal of actions is less based on internalized value sets or moral standards, and more on observed outcomes like Vallentyne; Portmore; Dietrich and List. Some studies in economics on decision-making take a similar tack, although economists usually pay equal attention to the external choice processes influencing results (Bozeman, 2019)

In philosophy, "value theory" is used three different ways. "Value theory" is a catch-all label used to cover all branches of moral philosophy, social and political philosophy, aesthetics, and the philosophy of religion that have some "evaluative" feature. In its narrowest sense, "value theory" is a normative ethical theory of interest to consequentialists. In this meaning, "value theory" is "axiology" Axiology classifies what and how good things are. One of the most important questions in axiology is whether values are subjective states of mind or objective states of the world. There are two main debates in axiology: (1) whether or not there is more than one fundamental value (the monism/pluralism debate), and (2) whether or not

things have only instrumental value (because they help you attain certain "higher" goals) or whether or not there are also things that have intrinsic value(Groenewoud et al., 2019; Schroeder, 2021).

Additionally, "value theory" refers to the branch of moral philosophy that studies value and goodness of all kinds. The theory of value involves axiology and many other problems regarding value and its relationship to other moral concepts. The division of moral theory into the theory of value crosses the traditional classification of moral theory into normative and metaethical inquiry, but is a worthy distinction in its own right; theoretical questions about value constitute a core domain of interest in moral theory, often cross the normative and metaethical boundaries (Schroeder, 2021).

Based on previous of philosophical perspectives, the values definition is varying. In axiology, Values refer to the significance, worth, or use of anything (a reality) and serve as the evaluation criterion for such a reality. There are numerous different types of values, including religious, cultural, artistic, economic, moral, political, transcultural, and environmental values. Since they pertain to human acts, the majority of these ethically significant values are moral and transcultural in nature. There are both objective and subjective moral values. Objective values are inherent to particular realities, constituting that reality itself, and they tend to be universal and enduring. The value is attributed to something (the reality considered in itself). However, subjective values are contingent upon the individual enjoying them and the individual's interests or preferences. In summary, subjective value is determined by an individual's evaluation (most values are subjective). Global bioethics seeks to discover, define, and gain consensus on transcultural principles deemed universal, so providing a foundation for global or shared moral thinking(Ten Have & Patrão Neves, 2021).

Also in psychology perspective, Values guide choices by evoking a sense of right and wrong, priorities, and a willingness to make meaning and see patterns. Values can be studied individually or collectively, like other cognitive constructs. Societies, cultures, and other social groups have norms, priorities, and guidelines that describe what people should do to do the "right," "moral," or "valued" thing. The study of values now emphasizes how values predict action.(Oyserman, 2015)

Moreover, social psychologists, such as Rokeach, Schwartz, Rohan, etc., have characterized values as abstract beliefs, Schwartz as "guiding principles in people's lives," and Rohan as "stable meaning-producing superordinate cognitive structure." These definitions endow values with substantial causal significance: values form the cognitive architecture of individuals and drive their behavior and reasoning.

Nonetheless, the same definitions frequently refer to values as motivations, reflecting the individual's and group's requirements. Motivations are far more changeable and fleeting. Particularly, requirements are frequently best characterized as homeostatic, meaning that motivations based on basic physiological and affiliative needs may fluctuate cyclically. In this instance, activity, that is, the contact of the body with the physical and social environment, maybe the causal component that enables the satisfaction or frustration of wants and, consequently, may enhance or reduce the relative importance of specific values (Fischer, 2017). Schwartz (2012) highlights six fundamental aspects of the theory of values that are implicit in the writings of numerous theorists:

(1) Values are beliefs intrinsically related to emotion. When values are awakened, they become emotionally charged. People who place a high value on independence become alarmed when it is endangered, despondent when they are unable to defend it, and content when they can enjoy it.

(2) Values are desirable objectives that motivate behavior. People who value social order, justice, and helpfulness are motivated to pursue these objectives.

(3) Values transcend particular actions and circumstances. Obedience and honesty, for instance, may be applicable in the job or at school, in commerce or politics, with friends or with strangers. This characteristic differentiates values from rules and attitudes that typically refer to particular behaviors, things, or situations.

(4) Values serve as criteria or standards. The selection or appraisal of activities, policies, individuals, and events is guided by values. People determine what is good or bad, justifiable or illegitimate, and worth doing or avoiding based on the potential repercussions for their most valued principles. However, the impact of values on daily decisions is rarely consciously considered. When the acts or decisions one is contemplating have opposing repercussions for different values one cherishes, one becomes cognizant of values.

(5) Values are ranked according to their respective relevance. Individuals' values establish an ordered hierarchy of priorities that define them as unique individuals. Do they place greater emphasis on accomplishment or fairness, on innovation or tradition? This hierarchical characteristic differentiates values from norms and attitudes as well.

(6) Action is guided by the relative importance of multiple values. Typically, any attitude or behavior has ramifications for multiple values. For instance, visiting church may convey and encourage values of conformity and tradition at the expense of hedonism and stimulation. Attitudes and behaviors are governed by the tradeoff among pertinent, competing values. When values are relevant to the situation (thus likely to be activated) and important to the actor, they impact behavior. These characteristics apply to all values. Differentiating one from another is the type of objective or motive it represents(Schwartz, 2012).

The word "value" can mean different things in different fields of study or even within fields, like when talking about social values in the context of economics (Massenberg, 2021). Especially when it comes to the words "value" (singular) and "values" (plural). It is clear that the words "value" and "values" (Agle and Caldwell; de Chernatony et al.; Solomon; Woo) need to be separated. "Value" refers to a preference judgment for either a single transaction or an end-state, but "values" are what determine any social behavior, including attitude, ideology, beliefs, and justifications (see, for example, Rokeach's value survey; Kahle's list of values; Mitchell's values and lifestyles methodology; or Schwartz's value survey). In other words, any preference judgment is based on values, standards, rules, criteria, norms, or ideals(Boksberger & Melsen, 2011). This debate over the term value(s) has piqued the interest of many in the field of public administration studies, particularly in the theory of public value(s).

Table 1. Aspects of values concept.

Characteristic	Relevant Studies
Values language is grammatically complex, distinguishing among the verb (valuing), the adjective (valuable), and the noun (value), each of which has multiple uses.	Gaus (1990), Harmon (2000)
Values provide reasons for action and choice.	Raz (1986), Herman (1985), Cooper (1981)
Values are not incommensurable; evidence of this is that we argue about values and what are “good” or “right” values.	Taylor (1989), Gaus (1990)
Values are impersonal; they do not require agreement for their identification.	Rescher (1969), Prall, (1921)
We can recognize differences of values while, at the same time, acknowledging that one person’s values are no better than another’s.	Bond (1981), Becker (1973), Lewis (1971)
Values and value judgments are grounded in the properties of the thing valued.	Cohen (1978), Hart (1949)
Values are chosen by the individual, and every individual has values that are in conflict with one another.	Cadwallader (1980), Nozick (1974)

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Values can be divided into categories related to their primacy (instrumental and intrinsic) and their type (e.g., hedonic, aesthetic, economic, moral).	Wright (1971), Laird (1929)
Values are both positive and negative (disvalue), concerning good and bad.	Bond (1981), Gert (1973)
Values are related to emotion as well as cognition.	Becker (1973), Rescher (1969)

Source: Own elaboration adapted from Bozeman (2007).

In spite of this, Bozeman(2007) provides a concise overview of the most important aspects of values (see Table1) in order to arrive at a unified definition of values, particularly in public values theory. In his words, value is

> A complex and broad-based assessment of an object or set of objects (where the objects may be concrete, psychological, socially constructed, or a combination of all three) characterized by both cognitive and emotive elements, arrived at after some deliberation, and, because a value is part of the individual's definition of self, it is not easily changed and it has the potential to elicit action (Bozeman, 2007, p.117).

His characterization of value is based on the following six presumptions:

1. Values express evaluative judgments.
2. The cognitive and emotional components of values are equally important.
3. The values are relatively constant.
4. Values have the potential to strongly influence behavior
5. Values are only modified (if at all) after deliberation.
6. Values help define an individual's sense of self.

Additionally, Timo Meynhardt (2009) utilized Rescher's definition of value to examine it from a psychological standpoint. According to his definition,

> In general, 'value' refers to something which—for whatever reason—is emphasized in reality and desirable and forceful for the one who evaluates, be it an individual, a societal group or an institution representing individuals or groups". In Baran's definition we find two aspects which we will later take up again: First, he includes "forcefulness" in his definition. In doing so he refers to internalization of values in and by individuals or groups if they are to be relevant for action. It is about psychological forces. Baran, secondly, refers to different "subjects" (individuals, groups, institutions) of evaluation (Meynhardt, 2009, p.197).

Examining the value definitions of Bozeman and Meynhardt, along with those of other philosophers and social scientists (Moore, Guss, Rescher's, etc.), reveals that the theory of value or the notion of value (s) "in the context of public value" is concerned with three characteristics: Firstly, Value Neutrality/Relativity: The debate between consequentialists and deontologists is commonly characterized as follows: Consequentialists argue that you must produce the best outcome possible. Deontologists, on the other hand, argue that you must often avoid engaging in particular activities, even though doing so might result in otherwise favorable outcomes. As a result, deontologists and consequentialists disagree as to what you should do in certain situations.(Dougherty, 2013).

From this vantage point, it remains controversial whether values-based activities should be evaluated based on the actor's motive (agent-relative) or on the consequences ensuing from the actions (agent-neutral). According to some researchers, activities are evaluated solely based on their outcomes, not their intentions, a moral code, or a system of a priori ideals. Consequentialism is the belief that actions based on ideals should be evaluated by their

outcomes. The agent-neutral, consequentialist point of view is appealing. In particular, it disregards mental states and minimizes the significance of motivations. This is appealing because it is possible to recall instances in history and possibly even in one's own life in which actions made with the best intentions had disastrous results. Thus, it is evident that the ability to evaluate outcomes independently of motivations is appealing Despite this, consequentialism and agent-neutral viewpoints provide little indications regarding good and bad outcomes (Bozeman, 2007).

Also, normative claims are those we make about ourselves and others rather than claims from a metaphysical realm of values. Consequentialism embodies this principle but also faces challenges because it focuses on the good as the origin of normative claims rather than on individuals (Korsgaard, 1993).

While utilitarianism (Utilitarianism is a consequentialist philosophy because it ties the morality of actions to their consequences… Shaw, 1998) places value on the tangible outcomes that result from actions, whereas deontological traditions prioritize the extent to which individuals uphold their duties and obligations to others, and the degree to which institutions adhere to expected standards. This framework is akin to that of the legal or judicial system, and is characterized by normative vocabulary such as fairness, justice, appropriate relationships, duties and responsibilities, as well as rights and privileges (Moore, 2013a).

In reality, both customary and philosophical moral standards have absolute laws. Immanuel Kant believed lying was unethical even if it saved a life. Kant says it's unethical to lie to A If A is trying to murder B and asks where B is, even if lying might spare B's life. Act utilitarians oppose rule-based moralities that label whole activities good or bad. They claim that treating whole classes of behaviors as right or bad is a mistake since their effects vary in different settings and morality must focus on individual actions' likely outcomes. In specific instances, their impacts define right or wrong. Act utilitarians acknowledge that moral "rules of thumb" may be valuable, but they contend that when violating a rule might accomplish more good than obeying it, people should break it. They don't see why they should follow a rule if breaking it will improve their lives(IEP, 2010; Varden, 2010). Unlike other value theories, utilitarianism provides a clear prescription and calculating tools. If applied rigorously, it can lead to ridiculous conclusions, such as promoting population growth to boost aggregate welfare or the killing of unhappy or unfortunate people to raise median net benefit. Utilitarianism says that difficulties can be avoided if one is not dogmatic. Utilitarianism teaches one to think of humans in aggregate, clouding the morality of individual relationships and undervaluing individuality (Bozeman, 2007).

Furthermore, there is an interesting debate surrounding whether Kantian moral prohibitions should be viewed as agent-relative, even when all reasons are teleological. Some scholars like (Ridge 2009; compare Huckfeldt 2007 and Dougherty 2013) argue that the best approach is to define the goal in agent-neutral terms, and to act in accordance with appropriate deontological rules to promote this goal. This strategy relies on the concept of "good willing" in a broad Kantian sense, combined with a robust theory of free will that recognizes the limits of one's control over another's will. Another key concept is that the agent-neutral teleological reasons are compatible with a non-maximizing theory of right action, in which the primary concern is always to minimize the risk of the worst possible outcomes. By preserving one's goodwill, one can prevent the possibility of everyone having an evil will, for instance. This maintains the necessary self/other asymmetry in the theory of value without resorting to agent-relativity (Ridge, 2005). This strategy paves the way for the combination of ethics and utilitarianism in public value, which is what Moore seeks to accomplish in his paper titled "Public Value Accounting: Establishing the Philosophical Foundation"

Secondly, Intrinsic, or Extrinsic: Value, in philosophy, refers to a characteristic of objects that indicates their level of significance. Objects possessing philosophical value can be

regarded as ethical or philosophical goods. Valuation involves the process of assigning value; each valuation is based on a distinctive ethical code that determines the value system used and employs its own 'language of valuation' based on various philosophical traditions and approaches. Various types of value(s) and value systems can be distinguished, which may be detached from objects or associated with them. In the latter case, the value can be viewed as intrinsic to the object or externally attributed by a third party.

Therefore, the theory of value distinguishes three distinct paradigms: Ideal values (the view that abstract objects exist, which Plato called forms); Real or objective values (emphasized by Naturalism); Subjective values (Individual and social perceptions of real-world objects) (Spangenberg & Settele, 2016).

In the context of public value, Meynhardt (2009) provided a brief summary of the ontology of value, stating that value objectivists claim that value "is," which means that value is an attribute of an object and is almost physically linked to it. The question for value idealism is how to discover and experience value. On the other hand, value subjectivists claim that something "has" a value, meaning that external entities or truths do not determine values but rather how subjects value (or evaluate) things. This perspective emphasizes a more active subject who discovers, realizes, and creates values while processing information and experiences.

However, scholars studying public values pay close attention to the distinction between "intrinsic" and "instrumental" values. Like Bozeman, Moore defines "public value" as a measurable, objective state of the world. Moore, like Bozeman, considers public value to be both extrinsic and intrinsic to the effective operation of a democratic government. Again, similar to Bozeman, the evaluated item may be viewed as having inherent value or as a means to another end. In contrast to Bozeman, Moore assumes a hierarchy of values in which public organizational effectiveness, efficiency, accountability, justice, and fairness within democratic governance are the most essential (intrinsic) values. According to Moore, elected officials and the citizenry are responsible for valuing public services. However, public managers also play a crucial role in demonstrating the worth through public value account (Bryson et al., 2014).

The classic divide of intrinsic vs. extrinsic (instrumental) value is, however, increasingly criticized. Numerous scholars have acknowledged the necessity for an intermediate category for objects that are beneficial for their own sake (not only instrumentally) but not on their own (not intrinsically), i.e., those that have both final and extrinsic worth. Similar ideas have also been called "inherent value" and "part of a relational value scheme"(Gunton et al., 2022). However, here, we will adopt Maynhert's interpretation of "relational value," as informed by Heydhe's examination of the connections between objective and subjective value. Heydhe's analysis posits that value is derived from the relationship between the subject valuing an object and the object itself. This implies that values cannot exist independently of this relationship, as they are subjective or relational in nature; a valuing subject is necessary for value to exist - "Value is the relationship." Value refers to the quality or essence of the relationship between a subject and an object. Through valuation, an object is associated with a subject, and by virtue of this valuation (or evaluation), a value emerges as an abstract entity of preference or desirability. Every value can ultimately be traced back to some use value, but the valuation process must serve as a prerequisite (Meynhardt & von Müller, 2014).

Values, as pointed out by Meynhardt (2009), are the end result of assessments and shape both present and future behavior. Up to this point, the primary argument has been an evolutionary one: "Value" is intrinsically linked to dynamic networks of interdependent relationships and ongoing cycles of subjective appraisals and reassessments. The term "objective" refers to a value that is accepted by a wide range of people because its assessment is consistent across a variety of sources (through the development of similar narratives or interpretations).

Nonetheless, this objectivity is still tied to subjects, making it "vulnerable" to shifts and revisions indiscursive practices and discourse. This perspective places a premium on dynamic connections; hence, it is contextually relative. Assuming some form of value-positivism, determining an object's "value" entails discovering how people feel about it on an emotional and motivational level (real or ideational). Meynhardt's argument leads him to propose the following ideas: "Value" is a subjective concept that is intertwined with relationships. When we evaluate natural or ideational objects, we are not discovering or acknowledging their inherent value; rather, we are creating it through our psychological assessment. "Objectivity" refers to shared values that are still connected to individual subjects.

Thirdly, Public Values Ethics and Collective Action: Philosophy devotes little effort to directly justifying collective action based on public values, but there is a great deal of focus on the related topic of establishing a public morality, and many of the dilemmas are extremely similar. Deontological and teleological (consequentialism) approaches to justifying public morality are utilized by philosophers. Each of them ultimately contributes to the public value (Bozeman, 2007).

Deontology is a theory in contemporary normative ethics that focuses on how agents should act and whether such actions are good or evil. In a nutshell, deontology puts the right before the good. Because of this, deontological normative theories require, ban, or punish behavior based on its own principles, no matter what results it may have (Ranganathan, 2022). Whether you call them "objective" moral laws (Kantian), "Natural Rights," or a "Contract Sociale," the principles of deontology hold that there are obligations and rights that apply to everyone (Rousseau). They comprise both societal and individual rights, as well as the rights of future generations, which are articulated as obligations of the current generation. In contrast to deontologists, consequentialists justify the rightness of an action not on the basis of responsibilities and rights, but on an evaluation of whether the decision's outcome maximizes happiness or utility. After deducting the suffering of everyone involved in any action, the choice is based on the aggregate pleasure.

Utilitarianism is a philosophy that aims to maximize the overall benefit for everyone involved, with the principle of "the greatest good for the greatest number" as its cornerstone. Meanwhile, rule consequentialism seeks to reconcile the utilitarian and deontological perspectives by promoting rule-based decisions that prioritize the common good and benefit both present and future generations. This approach has served as the basis for many European constitutions and laws. On the contrary, utility maximization based solely on self-interest, or hedonism and egoism, disregards the interests of others in favor of an individual's immediate desires. This perspective is evident in neoclassical economic valuation, where the homo economicus individual embodies this outlook. In neoclassical economics, only actions that align with this formula are deemed rational (Spangenberg & Settele, 2016).

In this line of literature, Moore (2014) argued that both utilitarian and deontological values are necessary in a normative framework to evaluate government actions with regard to their public value. Whereas, utilitarian values prioritize individual material desires and aggregate social outcomes. In contrast, deontological values look at how fair and just the government has been to each of its citizens and how much it has helped build a just and good society. Moreover, he proposed a matrix for their combination (see Figure 1).

In his matrix, he assumes that utilitarian concepts work well for monetary applications, while deontological concepts work well for authority applications. But public value accounting also accommodates utilitarian and deontological perspectives on the use of authority and money, respectively. As an example, if a desired social outcome, such as improved material welfare or increased justice, could be achieved more efficiently with less reliance on state authority, it would be in the public's best interest to pursue this approach. By reducing the use of authority, citizens would have more liberty in their lives. Additionally, since the

government's use of tax funds is the source of funding for achieving desired outcomes, citizens have a vested interest in ensuring that these funds are used both efficiently and fairly. Given that democratic government principles dictate that state coercive power should only be used when necessary and just, tax dollars must be used in a manner that promotes social justice and fairness. Figure 1 is a basic matrix depicting the relationship between the use of various governmental resources (such as money and authority) and the normative framework that is typically invoked by their use. The point here is that citizens evaluate governments and government managers across all four cells of this matrix, and will continue to do so in the future.

- The efficient and effective utilization of public funds
- The fair and proper use of public power
- The proficient and productive utilization of government power
- The fair and just utilization of funds provided by the public.

Citizens must be able to discuss, anticipate, and observe effect it's in each of these cells, which necessitates the development of a comprehensive accounting system for public value (Moore, 2014)

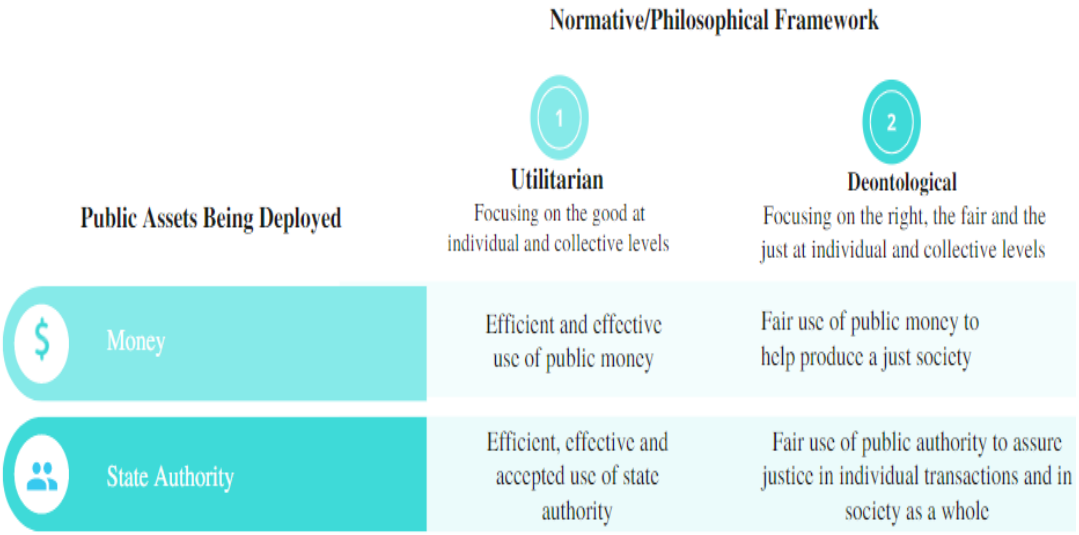

Figure 1. Normative/Philosophical framework.
Source: Own elaboration adapted from Moore (2014).

No matter if you act based on a teleological or a deontological reason, the problem remains of how to move from individual-level reasons (like acting based on a person's public values) to consensus-based collective action. Gaus's "constrained teleological justification" gives us a hint, but it doesn't show that people will agree on how to work together or what to do. It just shows that people might be able to see the good results of working together (Bozeman, 2007). The solution, however, can be found in the work of political philosophers, who stress that democracy is comprised of two essential components: aggregation and deliberation (Perote-Peña & Piggins, 2015). This serves to illustrate how we can progress from the level of individual reasons to the level of collective action based on consensus.

The central tenet of the deliberative method, popularized by the likes of John Dewey and Jürgen Habermas, is that group discussions facilitate understanding, which in turn leads to convergence of opinions (or preferences), and finally consensus. Freedom of access, equal rights to participate, honesty on the part of participants, absence of coercion in adopting positions, etc. are all necessary conditions for ideal speech situations. The strongest argument is always assumed to be true in such an intellectual discussion. Because it is the result of a reflexive process rather than the initial (possibly distorted) subjective views of the individuals involved, the resulting consensus is seen as rational. Thus, communicative rationality can be

used as a model of human behavior that differs from the traditional utilitarian view of rationality by emphasizing instead the importance of people's ability to understand one another. Good conditions for communicative rationality can be established by introducing deliberative institutions like focus groups, citizens' juries, and consensus conferences into the market sphere. (Massenberg, 2021).

Further, a school of thought from Dewey to Habermas, and beyond, contends that public deliberation is fundamental to democracy and that public participation processes can enhance democracies' capacity to address formidable threats. Accordingly, as opposed to relying solely on individual assessments, deliberative approaches highlight the importance of public discourse when dealing with common goods. (Dietz, 2013).

Furthermore, the Kantian theoretical foundations of reasons, inclusion, and justice or legitimacy are often cited by academics as the bedrock upon which the concept of deliberation rests. Deliberation, according to Gutmann and Thompson, is built on two pillars: good reasons and including everyone who should be. The first and foremost feature of deliberative democracy is the need for explanations from all participants... Accessibility of the justifications given in this process is another hallmark of deliberative democracy.

Both Rawls and Habermas, as elaborated by Schneiderhan & Khan (2008), think that deliberation can help us achieve just or legitimate goals, and that this is a process that does not take place within subjects but rather is realized through interactions between them. Rawls's goal is philosophical: he wants to develop a consistent theory of justice that can be applied anywhere. Rawls argues that people's understanding, their ability to appreciate perspectives other than their own, and their motivations are all profoundly influenced by the contexts in which they find themselves. Habermas, on the other hand, isn't on the hunt for a theory of justice; he just wants to find a social process that leads to fair outcomes. Habermas maintains throughout his writings that talking and thinking things through are essential to the creation of shared norms and values. Rawls, on the other hand, believes that deliberative rationality is the means by which such discourse becomes actualized.

Despite their differences, Rawls and Habermas share many ideas. Ultimately, they both argue that deliberation is necessary to reach "justified" or "legitimate" results, and they both develop a deliberation model that emphasizes reasons and inclusion (Schneiderhan & Khan, 2008). In a nutshell, public deliberation is a broad concept that encompasses a variety of methods that center on conversations between "ordinary people" with the goal of arriving at consensus on how to address societal issues.

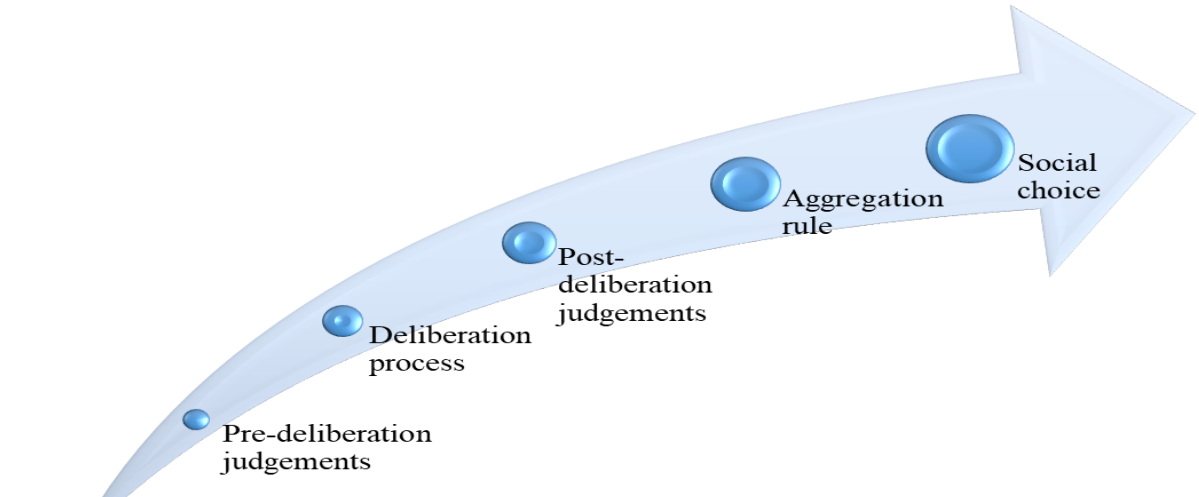

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Figure 2. Social choice model.
Source: Own elaboration adapted from Perote-Peña and Piggins (2015).

The use of deliberation is increasing, as evidenced by prominent health care institutions such as the NICE Citizens Council in the United Kingdom from 2002 to 2015 and the Citizens' Reference Panel on Health Technologies in Ontario, Canada, which was created in 2008. There are a variety of "mini-publics" that can be utilized to conduct public deliberation. These include citizen panels, juries, deliberative polls, planning cells, and other sorts of participatory budgeting(Baker et al., 2021). Furthermore, social choice theory places great importance on the analysis of preference aggregation. Essentially, preference aggregation refers to the process of consolidating the individual preference rankings of multiple people for a set of social alternatives into a single, collective preference ranking or choice. This fundamental structure was first introduced by Arrow and has since become the accepted norm. (C. List, 2022).

However, Grillos (2022)contends that deliberative discussion is more transformative than the simple aggregation of individual preferences, resulting in more socially optimal decision-making and behavior. His experimental findings show that those who engage in deliberative discourse with rational arguments attain superior collective outcomes. In 2015, Perote-Pea and Piggins devised a framework that combines preference transformation and aggregation models. In their approach, there are three stages: pre-deliberation, post-deliberation, and aggregation (when a social choice is made, refer to figure 2) (C. List, 2018). Prior to reaching the stage of judgment aggregation, a model must make explicit the process of judgment transformation through deliberation (it provides a suitable "technology" for deliberation). A democracy, according to the paradigm, consists of a deliberation path and an aggregation rule.

> The extent to which persuasion is possible among dissimilar individuals is limited by the “persuasion cost”, and when no more persuasion is possible, a voting rule chooses an alternative based on the final preference profile (Juan, Perote-Peña; Piggins, 2011, p.29).

In other words, the persuasion process is viewed as deterministic rather than random, and it is only possible to persuade individuals to a certain extent. The paradigm is extensible in numerous ways. They view persuasion as a deterministic, not random, process (Perote-Peña & Piggins, 2015). In contrast to the majority of social choice theorists, Perote- Peña and Piggins assume that an individual's preference ordering reflects that person's opinions about how good the options are from the group's perspective when there exists a true objective betterness ordering. Furthermore, they presume individuals reveal their preferences in good faith and with an attitude of deliberation (List, 2018).

Previous works on collective decision-making and preference aggregation have yielded valuable insights into the mechanisms behind collective action. However, such literature has fallen short in fully addressing the underlying motivations for such actions and evaluating public activities. Thankfully, the emergence of public values and corresponding research has filled in these gaps (Witesman, 2016). While the notion of the public interest is a useful foundation for deliberating on public affairs, actionable concepts are necessary to move beyond mere discussion. The concept of "public value" provides a concrete and practical framework for this purpose (Bozeman, 2007). Returning to the concept of public value, we can define it as a value that the majority of people value, and private value can gradually become public through public deliberation, acknowledgement, and awareness (Christensen et al., 2020).

In the context of public value(s), Witesman (2016) proposed a general framework (figure 3) to explain how individual beliefs regarding the role of government (public values) can be converted into outcomes (public value) through the use of public institutions like the government. In his paradigm, public values are considered as the source of individual preferences with regard to the possible collective action area. Then, these individual preferences must be utilized (through different preference aggregation techniques and public

organizations) to generate group decisions that result in actual collective action. Once executed, these acts either increase or decrease value for the aggregate public and/or other stakeholder groups (i.e., "public value" is either created or destroyed). Whether an attempt to increase, decrease, or maintain public value is a subjective assessment based on the individual perceptions of the people and groups that form the impacted public (s). Their assessments of the endeavor are the outcome of their use of individual or group public values as a set of evaluative criteria. Despite the common belief that only individuals can hold and express public values, it is now recognized that stakeholder groups and even formal organizations can do so as well. Individuals' value systems can be shaped to some extent by the norms and standards of the group or organization they work for. As a result, it is apparent that there are social and informal procedures for aggregating or sorting individual values into collective values. Depending on the nature and extent of this value aggregation, it is possible that the public values currently at play will shift.

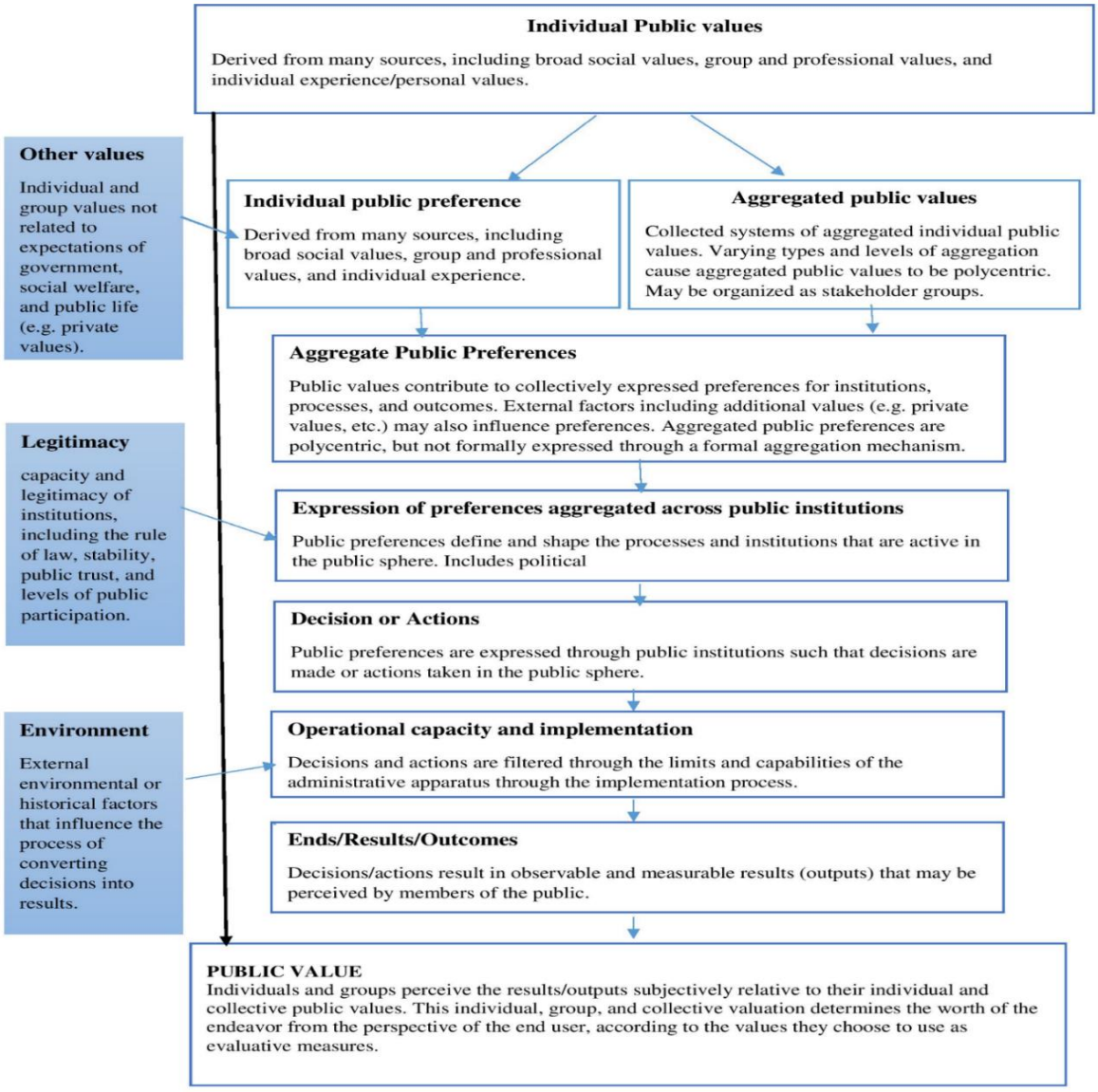

Figure 3. Framework that incorporates both public value and public values perspectives. Source: Own elaboration adapted from Witesman (2016).

In addition, Meynhardt (2010) suggested that public value can be determined by assessing how relationships with the public impact the fundamental needs of individuals, communities, and society. The creation of public value is rooted in the connections between individuals and society, and subjective judgments of basic needs, emotional-motivational states, and

experience-intensive practices are the basis of this creation. Moore (2014) posited that public value differs from private value in two significant ways. Firstly, public value may pertain to privately held principles prioritizing the well-being and fair treatment of others, which are considered public values because they relate to the welfare of others and equitable social connections. Secondly, public value can refer to specific values stated and embraced by a democratic polity utilizing democratic deliberation processes to direct the use of jointly held assets of the democratic state, such as tax revenues and power. Table 2 illustrates public value as a field within a matrix, where both valuing agents and substantive values become "more public" in two ways: either by becoming more public about the object of their focus (left to right movements in the matrix) or by becoming more collectively established as the shared view of many in society (top to bottom movements in the matrix). The most individual and private part of Table 2 is the upper-left cell of the matrix, while the most collective and public part is the bottom-right cell. The same table demonstrates how liberal democratic societies enable individuals and groups to generate public value through voluntary civic action and public policy decisions that require contributions to public goals. Individuals can express public values, including volunteering or donating to charities. Collectives such as commercial firms or professional associations can form to pursue the material well-being of their members, while others, like the American Red Cross, aim to encourage voluntary contributions of time and money to help others or to enable individuals to fulfill their moral duties towards others. Finally, others, like the Children's Defense Fund, form policy advocacy or political organizations.

Table 2. Degrees of "Publicness" in the Valuation of Social Conditions.

			Valued Objects			
			Less public ⟶ More public			
			Material Welfare	Welfare of Others	Duties to Others	Concepts of a Good and Just Society
Arbiters of Value	Less public ⇣ More public	Individuals	What do I think is good for me?	What do I think is good for family, friends, neighbors, and fellow citizens?	What do I think I owe to family, friends, neighbors, and fellow citizens?	What conditions do I think characterize a good and just society?
		Collective I: Social Movements/ Voluntary Associations	What do we private individuals want to do together to promote our material wellbeing?	What do we private individuals want to do together to help needy or deserving individuals?	What do we private individuals think we owe to one another as a matter of civic or public duty?	What do we private individuals think constitutes a good and just society, and what would the pursuit of that ideal require of us?
		Collective II: Democratic Government and Public Policy	How do we citizens want to use the powers of government to improve the material welfare of individuals in society?	How do we citizens want to use the powers of government to improve the material welfare of particularly needy individuals in society?	How do we citizens want to use the powers of government to protect the rights and impose the duties associated with citizenship in society?	How do we citizens want to use the powers of government to create a good and just society?

Source: Own elaboration adapted from Moore (2014).

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Although liberal societies strive to prioritize individual values, groups inevitably emerge to identify and pursue essential principles. Among these, none holds greater significance than the "public" that arises through democratic political processes, ultimately resulting in the codification of public value within legislation and other forms of public policy. To determine the value of a government enterprise, a cost-benefit analysis, program evaluation, and customer satisfaction survey are commonly employed (Moore, 2014)

One perspective on the question of sacrificing personal values for the benefit of the community is that an individual may weigh the benefits of adhering to a shared moral code against the costs of diverging from it. If achieving certain goals requires collective effort, then cooperation may entail setting aside other personal objectives. This pragmatic calculation involves weighing the gains from collective action against the losses incurred by submitting to community standards. This calculus can form the basis of a community's moral code, its legal system, or a more extensive social contract. Under these circumstances, we typically anticipate collective action to arise when there is sufficient agreement on the benefits of cooperation. Thus, shared values, education, and social cohesion can support or expand the scope of collective endeavors (Bozeman, 2007).

2.1.1. Relation Between Value, Representation, Intentions, Behaviors in Public

Individuals and groups identify, prioritize, and construct evaluative meanings for their needs. One's values, attitudes, and actions influence each phase of the judgment procedure (Moore & Asay, 2013). A subject is the starting point for the theory of value. It is difficult to define precisely what counts in a general sense, but it encompasses all of the following: The science of a cognitive system that is functionally integrated and whose fundamental units of analysis are beliefs (Schroeder, 2021; Shealy, 2015). Attitudes are functionally and cognitively related to the value system since they are composed of clusters of beliefs. Rokeach suggested further that classes of beliefs related with self-cognitions constitute "the innermost core of the overall belief system, and all other beliefs, attitudes, and values can be conceptualized as functionally organized around this innermost core." In Rokeach's conceptual schema, beliefs are not merely cognitions, but also dispositions to action that might evoke affect surrounding the object of the belief. In a comprehensive study conducted by Rokeach and colleagues, the relationships and characteristics outlined in their broad model were examined through a values survey and other related research initiatives. The findings of this study demonstrated that values, as defined by Rokeach, were significantly associated with differences in socioeconomic status, age, gender, race, religion, and lifestyle, and were also found to be significant predictors of a range of social attitudes and behaviors, including consumer behavior, addiction, political and economic tendencies (e.g., fascist, capitalist, socialist, and communist), and conservative and liberal ideologies. Moreover, Rokeach argued that beliefs and values are acquired during socialization and adaptation to the prevailing sociocultural context, and are central to other allied conceptual frameworks and research programs, such as authoritarianism and attribution theory. On a more general level, Rokeach recognized that beliefs and values were genuinely causal explanations of reality. In other words, what a person believes to be true about themselves, others, or entities/systems in the larger world influences their behavior (Shealy, 2015).

However, Moore & Asay (2013) assert that "value" is a common concept in discussions of human behavior from two distinct viewpoints. Firstly, In the context of economics and consumer behavior, "value" is a measurement of exchange. If you spend the cash on goods or services, you predict satisfaction from this exchange. It is deemed a good value if the individual exchanging resources believes he or she has obtained a reasonable return. This evaluation of fairness is subjective.

In the realm of economic value theory, there are two primary perspectives to consider: exchange value and value-in-use. Exchange value refers to the usefulness of a product or service in the context of market exchange, often expressed in terms of comparable pricing relative to other goods. On the other hand, value-in-use is the value a good hold due to its ability to satisfy wants and needs (Massenberg, 2021). This distinction was a pivotal moment in the development of economic theory as it provided a conceptual solution to the long-standing value problem. When Smith was writing, the causal link between value in use and value in exchange was not yet fully understood, and as a result, he primarily focused on exchange value. However, with significant advances in psychology and mathematics, it became clear that the value in exchange is determined by the marginal utility of the last available unit. This breakthrough ultimately reconciled both perspectives and resolved the value paradox, explaining why water's exchange value decreases despite its general usefulness (refer to Figure 4) (Eggert et al., 2018).

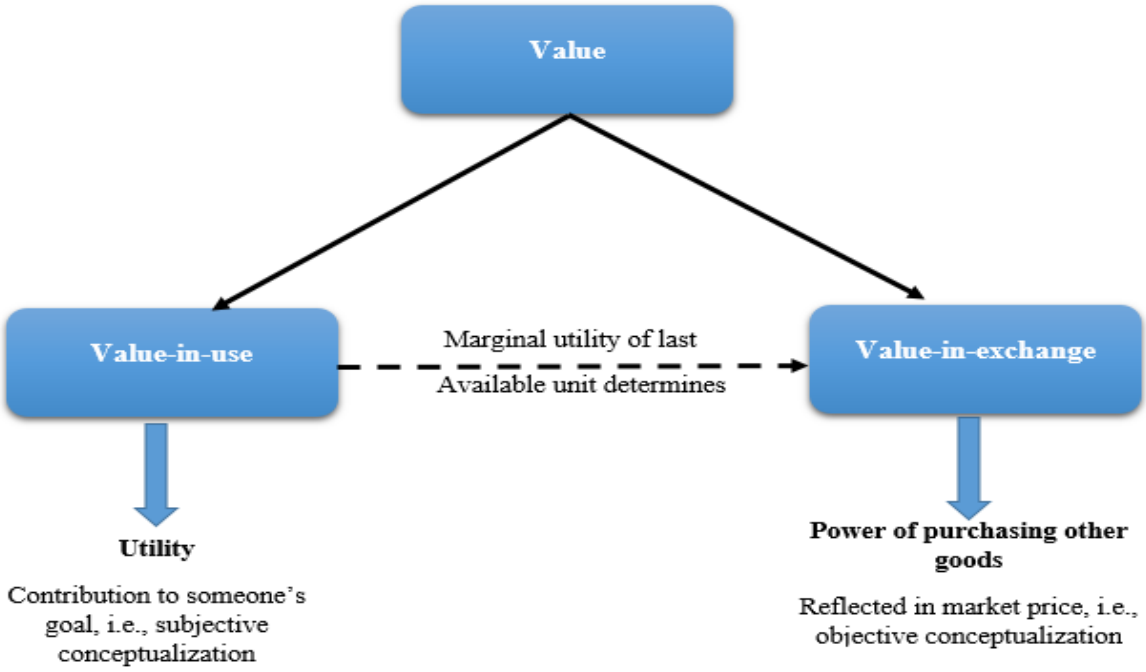

Figure 4. The value paradox.
Source: Own elaboration adapted from Eggert et al. (2018).

In addition, Alfred Marshall, a well-known neoclassical economist, defined the value as the price of equilibrium when the marginal utility equals the marginal cost. Consumers' willingness to pay decreases as the quantity they buy increases since the value they obtain from each additional purchase diminishes. Most economists aim to differentiate between the price and value of a product or service. Baier presented a broader interpretation of value, describing it as "the ability of a good, service, or activity to meet a need or provide a benefit to an individual or legal entity." At the time of consumption, consumers perceive and evaluate value. It is commonly accepted that value is created in users' processes as value-in-use. In reality, value (value-in-use) is a more significant indicator of well-being than price (value-in-exchange). Furthermore, the neoclassical utility concept is equivalent to the modern value concept. Therefore, the theory of value must be based on the law of diminishing marginal value. The theory of value not only explains the relationship between value (value-in-use) and price (value-in-exchange), but it also redefines the utility concept by combining value and price into the utility function (Trinh, 2014).Meanwhile, Grönroos & Voima (2012) suggested a framework for co-creating value from the provider sphere (company) to the customer sphere (figure 5). The roles of the company and the customer differ depending on the sphere of value

creation in their model. In the provider sphere, only potential value is generated; thus, the provider's production of resources and processes is simply value facilitation. In the joint sphere, the customer has a dual role. The customer and provider are co-producers of resources and processes. Although the customer establishes a joint value-creation sphere with the company, the customer remains the value creator. If direct interactions occur, the provider may only have the opportunity to participate in the customer's value-creation process and become a co-creator of value with the customer. In the remainder of the customer sphere, a closed system for the provider, the customer independently generates value since there are no direct interactions where the provider could influence the customer's value-of-use experience.

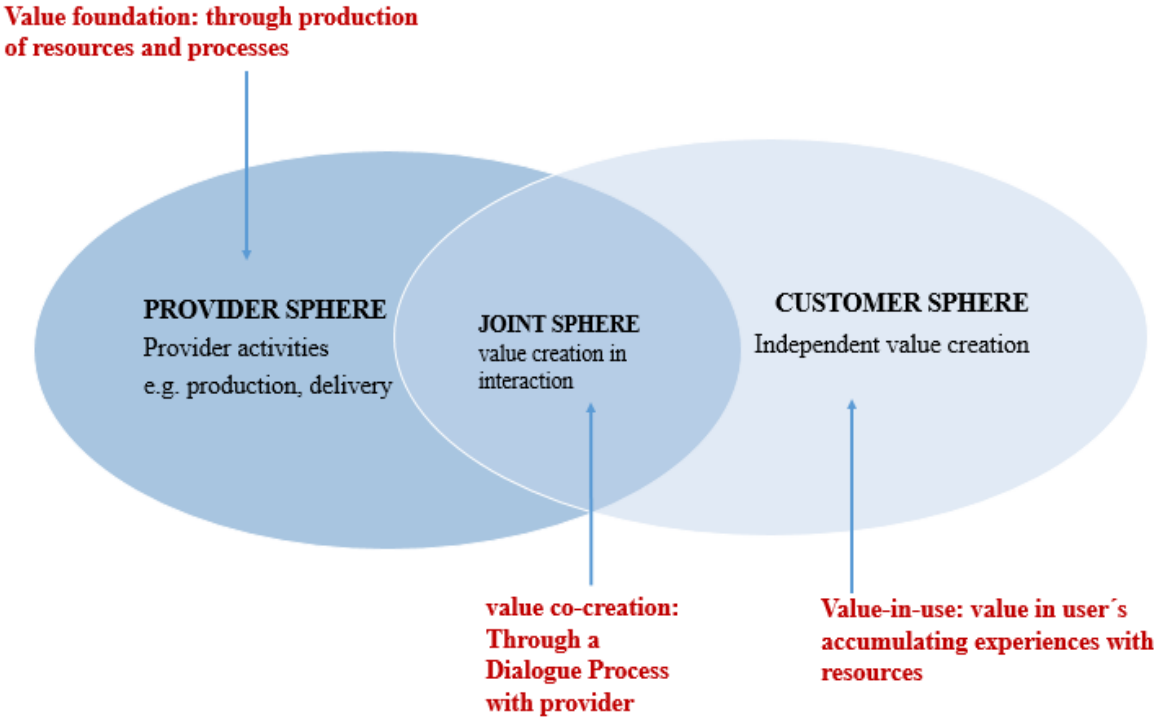

Figure 5. Value creation spheres.
Source: Own elaboration adapted from Grönroos and Voima (2012) and Trinh (2014).

In line with the literature, the service-dominant (S-D) marketing approach is gaining popularity as a way to challenge the traditional view of marketing, which has primarily focused on creating and distributing value. S-D logic argues that customer satisfaction cannot be achieved solely by providing something of value; rather, value is determined by the customer based on how they use it. At its core, S-D logic is a value-dominant approach that liberates marketing from its economic roots and shifts the focus to subjective value in resource integration and application, rather than resource exchange. This novel perspective asserts that (1) value is perceived and determined by the customer, (2) value is co-created through the integration of resources, and (3) marketing has a responsibility to identify, prepare, and facilitate opportunities for the co-creation of value in the customer's usage context. Rather than solely falling under the purview of the customer, the process of resource integration becomes a collaborative effort between the customer and the provider company(Eggert et al., 2018).

While this may be true, Racko, (2019) contends that economics is also acknowledged as being entrenched in the values of the homo economicus (rational economic individual), who calculates and utilizes the most effective means possible to pursue a desired aim. The entire neoclassical economics' theoretical notions are predicated on the instrumentally rational behavior of homo economicus. Economics not only provides generalizations about how people behave but also modifies their behavior when its rules and values (like hedonism, and power) are followed.

In consumer behavior, Boksberger & Melsen (2011) conducted a literature study on the value perceived in the service sector. In their review, they looked at perceived value from two perspectives: utilitarian and behavioral.

In utilitarianism, *perceived value* is often characterized as a ratio that weighs the total benefits received against the total sacrifices made. These benefits can be both cognitive and affective. The cognitive component assesses the consumer's expectations about the perceived performance of the service, including its quality. Meanwhile, the affective response to service consumption can be categorized into two distinct types: symbolic, which entails the consumption of services to fulfill consumers' symbolic needs, like self-enhancement or group membership, and hedonistic, which encompasses the multisensory, fantasy, and emotional aspects of consumers' service experiences, such as feeling joy or fear. In addition, Zeba et al. (2022) propose that utilitarian value is derived from consuming goods or services to achieve a task, while hedonic value is related to the emotional worth and entertainment experience of consuming a good or service. Zeba's research provides evidence for the utilitarian values, such as price savings, time savings, service excellence, and selection attributes. On the other hand, Eren's findings support the experiential values of online shopping, including interactivity, escape, entertainment, and visual appeal, and their impact on customer satisfaction and delight. These results imply that perceived value comprises both hedonistic and utilitarian elements. Additionally, consumers perceive sacrifices in value as a combination of monetary and non-monetary costs, which affect their perception of the service's worth.

Unlike the utilitarian focus on weighing benefits and costs, the behavioral perspective of perceived value takes a more comprehensive approach to the concept and seeks to explain it in greater detail. The foundation of this viewpoint is the social exchange theory, which posits that reciprocal transactions or social interaction are key. Consumers justify their behavior based on the advantages and sacrifices it entails for them, leading to the notion of an "exchange ratio" between activities or rewards and costs, whether tangible or intangible (Boksberger & Melsen, 2011).

Also, in means-end theory, Woodruff highlights that customer perceptions, preferences, and judgments determine value. Moving up and down the customer value hierarchical explains both expected and received value, as demonstrated by his model. As one ascends the ladder, it is suggested that buyers view items as collections of qualities and attribute performances. They create preferences for particular traits based on their ability to achieve desired outcomes, as evidenced by their use value and possession value. Customers also develop a preference for outcomes that assist them achieve their objectives. Customers employ goals and purposes to assign priority to outcomes, which in turn directs them when creating preferences for characteristics and attribute performance as they move down the hierarchy. Although scholars have defined and examined the antecedents of customer value, the majority of studies of its outcomes have been limited to purchase intention. Grewal et al. and Sirohi et al. have more recently added search intent and store loyalty into their conceptual model of consumer value. When a possible purchase appears to give a great deal of value, buyers are more likely to buy rather than consider alternatives(Kambiz & Ronak, 2010). In expanding upon the behavior-based approach (Boksberger & Melsen, 2011), Robert S. Hartman argued that various concepts or objects are assigned value based on three criteria: singularity (known as the "Intrinsic Value Dimension"), function or role importance ("Extrinsic Value Dimension"), and meaning or purpose ("Systemic Value Dimension"). The Intrinsic Value Dimension evaluates relational judgement, such as strong interpersonal skills. The Extrinsic Value Dimension evaluates excellence in tasks, projects, and skill competencies. Lastly, the Systemic Value Dimension assesses the ability to master long-term planning, strategic visioning, structural integrations, repercussions, and implications. (Nistal-Nuño, 2019).

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In addition, Holbrook's analysis of perceived value delves deeper into the behavioral aspects and characterizes it as an "interactive relativistic preference experience." He also devised a typology of perceived value, consisting of eight distinct types of value that stem from three contrasting factors: self-focused vs. other-focused, proactive vs. reactive, and extrinsic vs. intrinsic(Boksberger & Melsen, 2011). As seen in the figure 6, the intrinsic-extrinsic dimension pertains to whether a service is appreciated as an end in and of itself due to its attributes, or for the methods or functions it provides that assist users in achieving specific purposes. Self-oriented versus other-oriented refers to whether a product is appreciated for its utility to the user or for the responses it elicits in others. An automobile, for instance, has a self-oriented value because its practical attributes provide the owner with specific benefits, such as convenient transportation or safety, and an other-oriented value because it represents social standing and elicits responses from others.

	Extrinsic	Intrinsic	
Self-Oriented	Utilitarian Efficiency (e.g. convenience)	Emotional Play (e.g. Fun)	Active
	Excellence (e.g. Quality)	Aesthetics (e.g. Beauty)	Reactive
Other-Oriented	Social Status (e.g. Impression management)	Altruistic Ethics (e.g. Justice)	Active
	Esteem (e.g. Possession)	Spirituality (e.g. Sacredness	Reactive

Figure 6. Holbrook's types of User Value.
Source: Own elaboration adapted from Boztepe (2007).

Lastly, the active-reactive dimension distinguishes whether a person manipulates a product or whether the product manipulates the user. For instance, art pieces have a reactive value since their benefit is derived from passive adoration. A drill, on the other hand, has active value because its benefit is derived from the user's interaction with it (Boztepe, 2007). Also, Sánchez-Fernández et al. (2009) argued that Holbrook's typology is the best of the many multidimensional proposals for value because it takes into account both cognitive and emotional aspects of the consumption experience. This includes the economic, social, hedonic, and altruistic categories of consumer value. They think it is the most complete way to think about the value construct because it includes more possible sources of value than other ways. So, this proposal is practical, engaging, and challenging. As Kervenooael et al. suggested, the author thoroughly looks at value. Even though other models are good enough in many ways, they could be better in other ways. For example, they often do not go into detail about the different kinds of value, it is not clear how easily they can be turned into an adequate operational definition of consumer value, they only offer simple tools for measuring value, or they ignore some critical sources of value, like ethics and spirituality. Still, the Holbrook typology has some problems of its own. It is tough to use because of how complicated its structure is. For example, the differences between status and esteem or ethics and spirituality are so minor that they are hard to describe.

However, Moore & Asay (2013) point out that a second popular usage of the word "value" is arguably even more individual and subjective. An individual's values are frequently described as one's thoughts and behavior guiding principles. These ideas are thought to gradually emerge over time as a natural aspect of a person's social and psychological growth. Numerous scientific studies have focused on these attitudes in an effort to quantify, anticipate,

and comprehend the ways in which values direct cognition and conduct. Although universal values are elusive, the Theory of Universal Basic Human Values developed by Schwartz (2012) can help. Schwartz's (2012) theory delves into the concept of universal values, which serve as coping mechanisms for the three fundamental requirements of human existence. These requirements encompass the biological needs of individuals as organisms, the necessity of coordinated social interaction, and the survival and well-being of groups.

Figure 7. An Overview of the Schwartz Theory of Basic Values.
Source: Own elaboration adapted from Giménez and Tamajón (2019).

Schwartz and his group proposed the Theory of Basic Human Values (TBHV) in the late 1980s to expand Rokeach's theory and address its criticisms (Giménez & Tamajón, 2019). Rokeach defines values as long-held beliefs about abstract concepts or social behavior. Thus, an individual's values should predict their behavior in both experimental and real-world situations (Santos et al., 2018).

In the latest iteration of Schwartz's theory (refer to Figure 7), Schwartz and his colleagues have put forth nineteen motivational domains, which is a significant increase from the prior versions that only had seven and ten domains. Within these nineteen domains, Schwartz and his colleagues have identified three types of universalism (concern, nature, and tolerance), two types of benevolence (caring and dependability), two types of self-direction (thought and action), two types of conformity (rules and interpersonal), two types of power (dominance and resources), and two types of security (personal and societal).

In addition to these, they have added two fundamental values, namely humility and face (or appearance). These nineteen domains are arranged in a circular paradigm (refer to Figure 7), where adjacent domains are connected, and opposing domains are non-adjacent (Giménez & Tamajón, 2019). These values are classified based on two levels (personal and societal emphasis) and four moral classifications: 1. openness to changes (intrinsic motivation) versus conservatism; 2. self-transcendence (extrinsic motivation) versus self-enhancement. While some domains like conformity and security are placed horizontally, others like benevolence and power are placed vertically, which can cause inner conflict in individuals. The continuum shape of this arrangement signifies the relationship between different types of values (Giménez & Tamajón, 2019; Santos et al., 2018). Furthermore, Table (3) provides a comprehensive overview of each value proposed by Schwartz.

Table 3. Schwartz's value definitions.

4 third-order values	12 second-order values	19 first-order values
Self-transcendence (TRAS): promoting the wellbeing of society and nature above one's own interests, highlighting the acceptance of others as equals, as well as a concern for their wellbeing.	Universalism (UN): understanding and acceptation of others and a concern for the wellbeing of society and the planet we inhabit.	Nature (UNN): preservation of the natural environment.
		Concern (UNC): commitment to equality, justice and protection for all.
		Tolerance (UNT): acceptance and understanding of those different from oneself.
	Benevolence (BE): an interest and concern for the wellbeing of persons with whom one is in close contact.	Caring (BEC): devotion to the wellbeing of group members.
		Dependability (BED): being a reliable and trustworthy member of the in-group.
	Humility (HU): acknowledgement of one's insignificance in the grand scheme of things. Also included in conservation	
Conservation (CONS): preserving stability and security in relations with one's surroundings, with the emphasis on subservient self-repression, the preservation of traditional practices and protecting stability.	Conformity (CO): control of one's own impulses and behaviour, in line with social norms and expectations.	Rules (COR): compliance with norms, laws and formal obligations.
		Interpersonal (COI): avoidance of upsetting or harming others.
	Tradition (TR): respect for, commitment to and acceptation of the ideals and customs imposed by culture or religion.	
	Security (SE): personal wellbeing and that of in-persons and in-groups, as well as the stability of society and oneself.	Personal (SEP): safety in one's own immediate environment.
		Societal (SES): security and stability in wider society.
	Face or appearance (FA): security and power via the keeping up of one's own public image and avoidance of humiliation. Also included in self-enhancement.	
Self-enhancement (ENHA): promoting self-interest at the expense of others, emphasizing the search for personal success and dominance over others.	Power (PO): the search for social status and prestige, as well as control or dominance over people and resources.	Dominance (POD): power through exercising control over others.
		Resources (POR): power through control of material and social resources.
	Achievement (AC): personal success obtained by demonstrating competence according to social criteria or cultural norms.	
	Hedonism (HE): the search for pleasure and sensuous gratification or satisfaction for oneself. Also included in openness to change.	
Openness to change (OPEN):	Stimulation (ST): the search for excitement, novelty and change, needed to keep up a good functional level.	

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controlling one's own impulses and behaviour, according to social norms and expectations.	Self-direction (SD): independence of thought, action and opinion.	Thought (SDT): the freedom to cultivate one's own ideas and skills.
		Action (SDA): the freedom to determine one's own actions.

Source: Own elaboration adapted from Giménez and Tamajón (2019).

The Schwartz Theory of Basic Values also has problems with parsimony and theoretical focus and could slow scientific progress compared to meta-analyzed studies (Gouveia et al., 2014). One of the problems with Schwartz's original and improved versions is the measuring procedure. This results from the idea that values constitute a circular motivational continuum. This multifarious emphasis, with its associated values, entails that the items lack clear boundaries between values and have a shared burden on more than one, resulting in multicollinearity (Giménez & Tamajón, 2019).

2.1.1.1. How Values Relate to Attitudes, Beliefs, Intentions and Behavior

People often use attitudes, beliefs, traits, and norms to explain why individuals behave as they do. Each idea varies significantly from values, changing on a different scale and being assessed differently. As explained above, the significance of values as life's guiding principles varies (Schwartz, 2012), or it is codes or general principles guiding action (Oyserman, 2015).

Beliefs are ideas we hold about how things are connected or related to each other, and how true we think those ideas are. (Schwartz, 2012) or, broadly speaking, the attitude we have whenever we accept something to be the case or see it as true (Giray et al., 2022). an example of the belief that "war never solves issues". Everyone has certain beliefs about how the world works, but these beliefs can differ in how strongly we hold them. In contrast to values, beliefs are about how likely it is that a relationship is true, not about how important goals are as guiding principles for life (Schwartz, 2012). Also, Schwartz (2012) defines norms as behavioral standards or guidelines for members of a group or society. The norms include statements like "we should stand up when the national anthem is played." Norms vary based on how much we agree or disagree with the idea that people should act a certain way. If we accept or reject a norm, it is because of our value judgments about that norm. Because norms dictate actions with predetermined outcomes, our propensity to accept them varies according to whether or not those outcomes are consistent with our most important values. Norms are social expectations, and how likely we are to accept them depends on how much we value conformity and how much we value our own freedom.

On the other hand, attitudes are evaluations of an individual's experiences, ranging from negative to positive, and are relatively consistent. These evaluations can pertain to concepts, people, behaviors, and other components of a person's experience. Situational factors, including observations of one's behavior, can impact these evaluations (Lindgren et al., 2021). Our attitudes are rooted in our values, which serve as the basis for our assessments. Positive evaluations are given to individuals, actions, and occurrences if they promote or protect the achievement of the goals we valued. If they impede or threaten the achievement of these valued objectives, we assess them negatively. For instance, if we place a high value on stimulation and a low value on security, we are likely to view bungee jumping positively(Schwartz, 2012). Furthermore, values may exert their influence on behavior through their effect on attitudes. Attitudes are more tangible and indicate an individual's opinion regarding a specific concept or thing, such as violence or adoption, whereas values are, by definition, abstract. As a result, attitudes may play a role in mediating the relation between values and behaviors (Benish-Weisman et al., 2017). Numerous models of health behavior incorporate attitudes as an important explanatory component; research has demonstrated that attitudes predict both intention and behavior.

2. LITERATURE REVIEW

Until now, the idea of behavior has been utilized with the assumption that the reader has some prior familiarity with the topic. But seriously, what exactly is behavior? Like St. Augustine's famous response to the question of the time: "I know what time it is as long as nobody asks, but when someone asks, I no longer know," the answer to this question is simple at first glance but becomes less so with more reflection. Many diverse meanings of "behavior" can be found in the field of psychology. The majority of them center on an observable criterion. The issue with that kind of description is that it encompasses things like tics but leaves out things like mental prayer, which are clearly intentional(Cieciuch, 2017). However, Musundire & Lumadi (2019) defined behavior as the tangible expression of feelings through actions, verbal or body language. From this definition, it can be inferred that behavior refers to how an action, statement, or any other form of expression reflects a person's mental state. from this definition (E. S. Anderson & Pildes, 2000). Furthermore, human mental states like perceptions, thoughts, beliefs, and desires are both self-referential and externally-directed(Caamaño-Alegre & Caamaño-Alegre, 2019). Consequently, the relationship between mental states and their expressions has three dimensions: ontological, epistemological, and normative. To begin, mental states are realized and embodied in expressions of those states. Second, mental states are manifested when they are cast in a form that allows for their identification. Last but not least, different vehicles for expression can be more or less effective at conveying various states of mind. Let's give more thought to each of these factors individually. Mental states that are expressive might be considered as possibilities that can be realized in multiple ways.

These mental states are only potentials until they are fully expressed. For example, if a father fails to consider his daughter's interests and protect her from harm, it can be argued that he does not truly love her. However, if he does use her interests as a reason to help her, his actions will serve as a genuine expression of his love for herm(E. S. Anderson & Pildes, 2000).

There are many ways to communicate our mental states, whether through speech or action. Regardless of the method, the underlying thought remains the same. For instance, saying "I am feeling cold" in any language conveys the same idea. This relationship between expression and mental state is one of realization or embodiment. By expressing our mental state, we allow others to recognize it. However, interpretation is required to understand the meaning behind someone's words or actions entirely. We must understand the context in order to interpret them accurately.

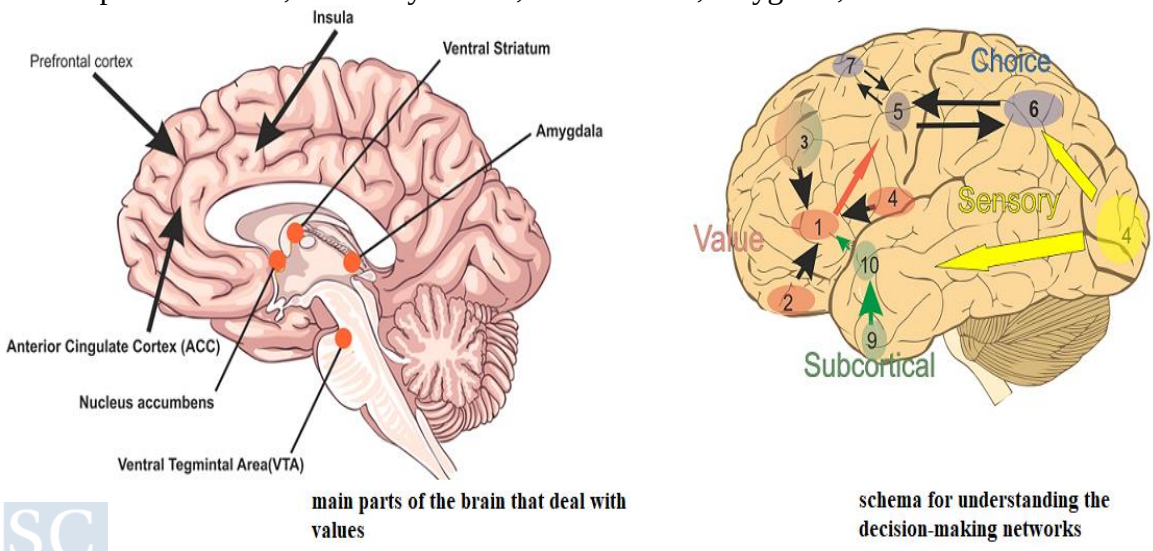
Additionally, mental states have a normative relationship with their representation. Any expression can be evaluated based on how well it conveys the intended mental state. Poorly organized, unclear, or incoherent speech may fail to express an idea effectively, while actions that do not accurately reflect intention, feelings, or attitudes may be evaluated as inadequate.(E. S. Anderson & Pildes, 2000). And Caamaño-Alegre & Caamaño-Alegre (2019) argued that it is critical to recognize that intentions are influenced by both representations and values. The intention of an agent to accomplish something is derived from his or her representation of that things as well as the value that the agent attaches to it. Remember that, according to Davidson, in order to properly evaluate human behavior, we must be able to recognize motivations. These are composed of reasons and intentions, with the former implying an epistemic attitude toward the compatibility of representations with reality. Thus, motives and their constituents may develop, to a greater or lesser extent, from beliefs, that is, from linked inclinations to think in certain ways. Recognizing these key characteristics of what we commonly refer to as human conduct.

When considering the connection between values and attitudes, as well as attitudes and actions, Ajzen notes an important point: underlying tendencies can be accurately described at various levels of generality. Nonetheless, we must recognize that there is a tradeoff between breadth and precision. Broad attitudes and values can shed light on a wide range of behaviors, but only explain a portion of the variability in any given behavior. Conversely, behavior-

specific measures of attitudes, subjective norms, perceptions of control, and intentions can account for a significant amount of variability, but only for the particular behavior in question (Ajzen, 2012). As a whole, a person needs to have positive attitudes in order to be motivated and engaged in a particular action. The fundamental beliefs and values that people have on the inside are the source of their attitudes. Our prior experiences form the basis for the assumptions and convictions that we regard as true, which we refer to as our beliefs. The ideas that are worthy of consideration are values, and they are founded on things, concepts, and people. The expression of these internalized systems, which include attitudes, beliefs, and values, is done through behaviors(Lasmono, 2022).

In recent times, the field of neuroscience has yielded significant knowledge regarding the operations of the brain, presenting unparalleled prospects for the acquisition, compilation, interpretation, and manipulation of data derived from the human brain. The recent progress in this field has expanded the potential for comprehending and forecasting human behavior, thereby illuminating the intricate connection between personal values and actions(UNESCO et al., 2023). Growing body of neuroscience literature highlights the significance of different brain regions in the representation of value, including the insula, ventral tegmental area, ventral stratum, amygdala etc. see Figure (8) (Duarte et al., 2020; Sokol-Hessner & Phelps, 2016). For instance, the ventral striatum (nucleus accumbens), ventromedial prefrontal cortex and orbitofrontal cortex have been extensively associated with decision-making involving reward value and prediction error processing (Duarte et al., 2020). On the other hand, amygdala, and insula play a role in processing and managing social information, including emotion-related social signals, social values, motivation, and identity (Han et al., 2021; Teixeira et al., 2022).

In contrast, it is important to note that brain structure and function are interconnected and do not work independently of one another (Han et al., 2021). An example of this can be found in the schema of decision-making networks within the human brain, where information originating from cortical and subcortical structures converges onto a unified representation of value. This representation is subsequently transmitted to the motor control circuitry responsible for executing the chosen action. The establishment of the final common representation is heavily influenced by modulatory inputs, which serve to transmit signals associated with arousal, internal state, and emotional intensity (Levy & Glimcher, 2015); see the right side of Figure (8) where the numbered areas in the diagram represent different brain regions involved in decision-making, such as vmPFC, OFC, DLPFC, insula, primary motor cortex (M1), posterior parietal cortex, frontal eye fields, visual cortex, amygdala, and striatum.



main parts of the brain that deal with values

schema for understanding the decision-making networks

Figure 8. Brain areas important for investigations into values and decision making. Source: Own elaboration adapted from Levy and Glimcher (2016), Han et al. (2021), and Teixeira et al. (2022).

Finally, the recent study by Lee and colleagues (2022) shed light on the relationship between value expression and behavior, based on self-reported data. Their findings revealed that individuals who prioritize a particular value are more likely to engage in behaviors that align with that value, thereby strengthening their relationships. Conversely, those who assign lower importance to a value tend to engage in value-expressive behaviors less frequently, resulting in weaker relationships. These insights offer a comprehensive understanding of the connection between values and behavior.

2.2. OVERALL OF VALUES' THEORIES (ECONOMIC STANDPOINT)

One of the most persistent issues in economics is "Where do value arise?" One method that economic philosophers have attempted to resolve this question is by addressing the issue of value first (Henry, 2000). The core of the majority of economic paradigms is a theory of value see Figure (9) (Moro-Visconti, 2022). Classical political economists believed that output dictated value. This concept was improved into the Labor Theory of Value since most production costs could be reduced to labor. Neoclassical economists sought value in the process of exchange on the market and produced the Marginal Theory of Value. Post-Keynesians are actively challenging both of these ideas with their Sraffian Theory of Value, which, like the labor theory of value, centered on production rather than exchange. Any economic theory of value is a highly abstract formulation; value theory is the primary intersection between economics and philosophy (Henry, 2000).

Moreover, the economic theory of value seeks to elucidate the factors influencing the exchange value or price of goods and services (Pirgmaier, 2021). Since the inception of the commodity-to-currency exchange, economic theorists have endeavored to comprehend how prices are determined. The term "value" was used to indicate the relative price of a good or service (Orléan, 2014). Figure (9) depicts the primary overlapping theories of value.

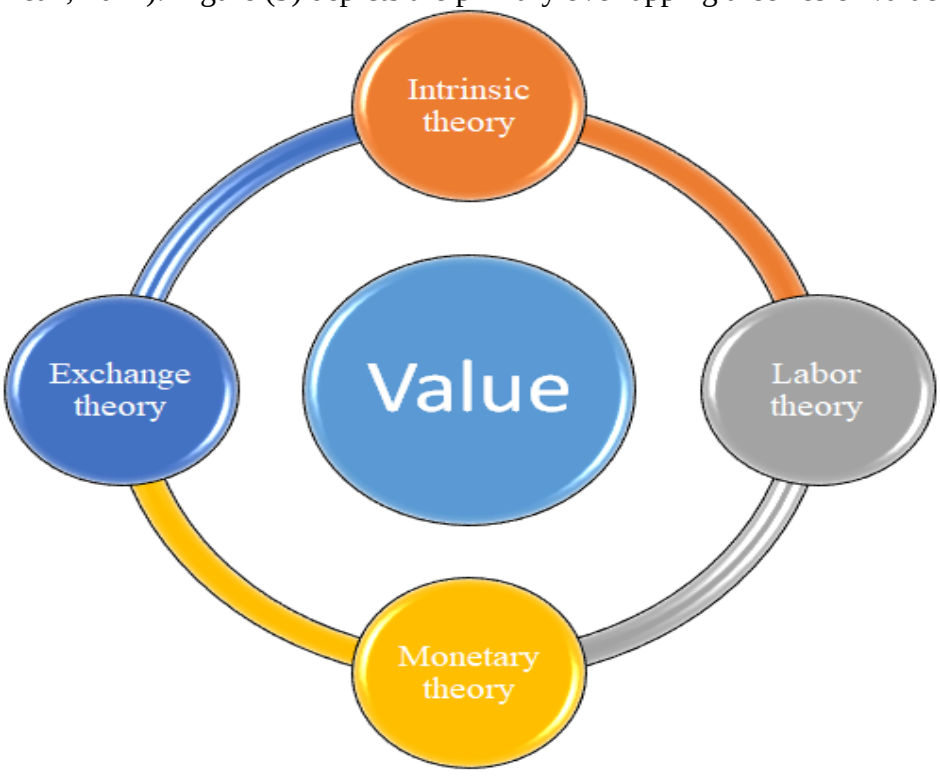


Figure 9. Theories of value.
Source: Own elaboration adapted from Moro-Visconti (2022).

Value, according to the intrinsic (objective) theory of value, is something that exists "in and of itself" and can be measured in objective terms. The term "intrinsic value" is commonly

used in the field of financial economics to refer to the true worth of a publicly traded stock. Semi-strong efficient market hypotheses state that if the financial market integrates all the public information that fuels fundamental research, then it is efficient. The labor theory of value, a central tenet of classical economics (which owes much to the seminal works of David Ricardo and Karl Marx), states that the monetary worth of a good or service is equal to the sum of the socially necessary labor expended on its production. This aligns with the cost approach to valuing a company, which holds that a product's worth is based on the amount of time and effort put into making it. The relationship between use-value (individual utility) and exchange value forms the basis of the exchange theory of value (the proportion at which a commodity can be exchanged for other commodities). The difference between the exchange and use values determines the added value. According to monetary theory, money is both a commodity and a representation of value. It implies that monetary exchange is an abstract and malleable process.(Moro-Visconti, 2022).

Moreover, value is defined as the monetary worth a person assigns to an economic good based on the benefit they derive from the good. It is frequently determined by the individual's willingness to pay, which is typically expressed in monetary units (Chan et al., 2012; Romero et al., 2008). In other words, value is the trade-off between the economic benefits perceived and the financial costs (Tiago & Amaral, 2011). but It is essential not to confuse economic value with market value, which is the price consumers are willing to pay for a product or service in the current market. The market price of an item may be higher or lower than what a person thinks the item is worth (French, 2003; Lind, 1998). Economic values, on the other hand, are linked to market values; for example, the economic worth of land is assessed in light of land market conditions. In addition, markets reflect the attitudes and activities of individuals in response to social and economic pressures, as well as the limits of the law and legal burdens. The concepts of economic value and market value are intrinsically related. Economic worth in the sense of market value encompasses a plethora of diverse influencing factors that vastly outnumber those based on economic dynamics. In addition to political influences, the concept of economic values also incorporates social and environmental pressures. Market value and market forces are linked to "public interests" and the social value system (Vries & Voß, 2018).

As seen above, the main debates in economic theory have been about how to define "value" in a consistent way. Scholars who have taken part in these debates have talked about "value" in ways that have changed the way people think about economics today. Adam Smith and other classical economists said that the value of a good is equal to the amount of labor that can be saved or bought by trading it for another good. So, labor is the true measure of how much something is valuable. This led to the beginnings of the labor theory of value. David Ricardo also says that the value of a good is based on the relative amount of labor" that it takes to create it (Shashwat Agrawal, 2022). According to Taylor (1996) The classical political economists' approach to creating a theory of value was characterized by three fundamental features. Initially, all classical economists believed it essential to begin their examinations of capitalism with the issue of value. Second, classical economics sought value in the production conditions. Items acquired their specific values in the workshop or factory, not on the market. Thirdly, all classical economists committed to a subsistence theory of wages in one form or another, albeit for different reasons. This meant that the labor cost equaled the value of the products and services necessary for a working-class family to survive.

The Function of Value or "natural price" is a crucial notion in Smith's work (Milgate, 1991). Temporary market price variations from natural prices determine his capitalists' production directives. When the market price exceeds the natural price, profits will also exceed their natural rates. This industry will continue to attract new capital until greater output brings prices and earnings to their normal levels. When the market price is lower than the natural price, earnings will be lower than their natural rates. Capital will exit the industry until a decline

in output raises prices and profits to their normal levels. The expenses of production, in turn, determine the natural price. The production costs can be split into labor expenses, rent, and profit. The natural price of labor is the cost of the commodities and services that employees require in order to work and raise their families (FOLEY, 2000; Kurz & Salvadori, 1997).

For Smith, a commodity's long-run worth equals its production cost; the "natural" price is the sum of labor, capital, and land. A rise in one of these elements, especially wages, would raise the price of the goods it affects. If values changed more than nominal prices (Stigler, 1958).Yet, how is the natural profit rate determined? Or the normal rental rate? Smith has presented neither an economic nor a sociological premise that would justify either of these rates. He leaves us with an imperfect value theory (Taylor,1996). Additionally, David Ricardo (1772–1823) developed Smith's arguments into a more coherent labor theory of value. In determining the value of a product, Ricardo also considers the labor required to produce the raw materials and the machinery. For Ricardo, the "natural price of labor" is the wage that would satisfy his needs for food and family comforts (Agrawal, 2022). Ricardo's theory of value was largely based on his desire to fix what he thought were Adam Smith's most important mistakes(Stigler, 1958).

In Ricardo labor theory value, value is established by the quantity of work required for manufacturing, which includes, of course, the labor utilized to generate raw materials and "worn out" components of capital equipment. Profit and rent are included into his value theory, unlike Smith, who had added them as costs (Taylor,1996). He improved Smith's labor theory of value. Smith regarded labor the most important component of a product's value, although he didn't always characterize it uniformly. Smithian framework considers profit and rent labor. Ricardo determined a product's exchange value based on the "relative quantity of labor required for its manufacture" Ricardo considers the raw material's labor and machinery when calculating its value. Ricardo explains how wages are computed. Ricardo's "natural price of labor" is his subsistence pay, which covers food and family needs. When market price of labor is higher than natural price, workers are pleased and thrive. When market price of labor is below natural price, workers suffer. Ricardo considers the owner's profit when evaluating the product's value. He disputes rent's significance in determining a commodity's value. Ricardo said, the value of a commodity is divided into two parts: stock earnings and wages. (Agrawal, 2022; Hunt & Lautzenheiser, 2015).

In a classical economic framework, the value of the commodity was determined by the amount of labor, raw materials, and machinery invested in its production. In addition, it incorporated the exchange between capital and labor, which corresponds to the law of value in the Ricardian framework(Fetter, 1994; Sowell, 2015). Smith included the land's rent as a component of worth. Both Smith and Ricardo included the profit of the stockholder as a determinant of the commodity's exchange value. (Agrawal, 2022). But the labor theory of value had one significant problem. The natural price theory would only be applicable if labor-to-capital ratios were identical across all industries. Specific sectors rely more on labor than capital, while others rely more on capital than labor. If there were a change in income distribution between profits and wages, it would have diverse impacts on costs within various industries (Henry, 2000). On other hand, Karl Marx mostly developed his ideas within the context of David Ricardo's labor theory of value. Marx's use of fixed capital and the labor theory of value to determine the origin of profit were the two most significant deviations. While Ricardo predicted a certain course for capitalism, Karl Marx used the labor theory of value to foresee an alternative future (Milios et al., 2018). In his theory of value, Marx differentiates between surplus value and profit about capital volume. Profit is the discrepancy between the product's worth and the constant and variable capital value. In contrast, surplus value is the difference between newly created value and the value of the labor force. The exploitation rate measures the surplus value generated per unit of variable capital. In contrast, the rate of profit

measures the rate of capital expansion, rendering the different roles of the means of production and labor force in output irrelevant (Ilegbinosa, 2012). Marx contended that labor is the origin of all value and, as a result, profit (Slack, 2020).

However, Karl Marx's version of the labor theory of value needs to be revised as a theory of natural pricing. It did not solve Ricardo's problem of using labor as a value standard. Even if labor were used as a value standard, it would contradict our assumption that the profit rate in long-term equilibrium would be consistent across all industries, such as petroleum refineries and shirt-making firms (Henry, 2000). Neoclassical economics developed Ricardo's theory of rent into the Marginal Theory of Value, which positions value at the margin of production, just as Ricardo discovered that land rent is determined at the margin of agriculture (Fine, 1983; Sinha, 2013).

The "law of declining marginal utility" states that the demand for any good decreases as more units are consumed over a particular length of time, and he claims that industries with rising costs are the norm. i.e. Costs per unit increase when production of a specific product increases over time (Dror & Firth, 2014; Taylor,1996).

The marginal theory of value, pioneered by neoclassical economists (Boerger, 2016), posits that value arises from the intersection of demand and supply - much like the two blades of a pair of scissors in Alfred Marshall's widely-known metaphor. As both buyer and seller, each individual is subject to the relentless laws governing supply and demand (Henry, 2000). The neoclassical economy is based on the following three key assumptions: Individuals have rational choices among identifiable and value-assignable outcomes. Humans maximize utility, whereas companies optimize profits. Thirdly, people behave independently based on complete and pertinent information (Encyclopedia, 2013; Nicholas, 2011).

According to Taylor's (1996) evaluation of neoclassical economics, several criteria must be met. Firstly, the marginal theory of value should provide relative prices directly and offer a logical explanation for how prices shift in response to changes in demand or technology. Secondly, it should not be limited to replicable items like the labor theory of value. Instead, it should examine income distribution by viewing salaries, profits, and rents as prices that arise on labor, capital, and land markets. However, this approach requires a certain degree of aggregation that contradicts the core principles of the theory.

Additionally, theories of economic growth based on the marginal theory of value need the additional premise that capital exists as a physical entity that can be measured. This issue has sparked significant debate among neoclassical and post-Keynesian economists. The assumptions of rising costs, diminishing marginal utility, and supply and demand independence are essential to the marginal theory of value and cannot be altered without destroying the theory. While the marginal theory of value is a relatively straightforward theory of relative prices, it must be clarified as a theory of income distribution.

Varoufakis and his colleagues have raised concerns about neoclassical economics, noting that despite undergoing constant transformations, it remains well-defined by three meta-axioms (methodological individualism, methodological instrumentalism, and methodological equilibration) that have formed the basis of all neoclassical analyses since the mid-1800s.

They argue that neoclassical economics owes its stature within the social sciences, its ability to attract research funding, and institutional importance to its skill in concealing these meta-axioms (Arnsperger & Varoufakis, 2006; Varoufakis, 2007). In contrast, Neck (2020) has concluded that neoclassical economics remains the dominant approach to economic theory thanks to its superior mathematical methodology, ability to integrate elements of alternative approaches, and ability to adapt its doctrines to include elements of other theories.

According to Weintraub, when defending deficit spending against the conservative claim that it was Keynesian, President Richard Nixon reportedly responded, "We are all Keynesians now." In reality, he should have said, "We are all neoclassical now, even the Keynesians,

because neoclassical economics is what students are taught and what is considered mainstream today" (Korff, 2008).

In essence, the debate over the source of value revolved around identifying the primary cause between two causes: labor (as asserted by the English classical tradition, especially Adam Smith and Ricardo), utility (as argued by the French classical tradition, J.-B. Say), or marginal utility (as proposed by the marginalist movement in the 1870s). To clarify, the controversy did not aim to pinpoint the sole reason for value (whether it be utility or cost), but rather to establish the more fundamental of the two causes (Inoua & Smith, 2020).

Additionally, value is determined primarily by production technique and income distribution, according to the traditional labor theory of value and the more recent Sraffian theory of value. The marginal theory of value, now the most popular economic theory, says that value is found when the supply force of cost meets the demand force of utility (Taylor, 2001).

In contrast, depending on the school of thought, economic theory entails a variety of value concepts. However, economic theories can be classified into two paradigms: the exchange paradigm and the intrinsic value/value paradigm (price or product value) (R. E. Wagner, 2007). The value paradigm assumes a particular result of the exchange process: trade equilibrium. this puts a "top-down" structure on the resulting theory; this assumption dictates everything else. The exchange paradigm, in contrast, makes no assumptions about the result of the exchange process. Its theory is instead constructed "from the bottom up" — that is, from individual behavior rather than trading equilibrium. Therefore, building ensures conformity with the methodological individualism concept. It is feasible to be more realistic about the trade environment once the premise of trading equilibrium is abandoned (Kohn, 2004). Kohn also adds that many researchers have attempted to bridge the gap between the two programs by employing hybrid theory, but concludes that this approach is indigestible (R. E. Wagner, 2007). And Orléan (2014)contends that value is unrelated to labor, utility, or any other pre-market exchange attribute. According to him, economic value is a social force whose wide sphere of influence, akin to an empire, encompasses every facet of economic life. The cornerstone of markets is the association of value with money, therefore exchange value can only be considered a social institution.

Additionally, economists use the term "theory of value" to describe a theory that aims to explain the pricing in a capitalist system in the long run. However, value theories also attempt to clarify what prices should be. During the Middle Ages, scholars employed the concept of a just price, which was the price that allowed the producer to earn a living relative to their social status. A few institutionalists have proposed similar concepts, such as normative and fair values. These ethical or social theories of value become more critical when we substitute market pricing with social pricing, such as a minimum wage or a crop-price support program.

In addition, Amartya Sen opposed the notion that utility maximization or, more precisely, an extended utility function can adequately explain human behavior. Instead, Sen distinguishes between two distinct forms of altruism: commitment and sympathy. The concept of sympathy is comparable to neoclassical conceptions of altruism, in which the improvement of another person's well-being directly improves the individual's own well-being.

In contrast, commitment-based actions are motivated by a sense of duty, are non-egoistic, and may even be detrimental to the individual's well-being. Therefore, behavior resulting from commitment is not consistent with the assumptions of self-interest and maximization of individual utility. Commitment is relevant for public goods but not for private goods characterized by perfect excludability and competition (Massenberg, 2021).

Moreover, Sen argues that although self-interest maximization is one of the most powerful motivators of human behavior, it is only one of the factors that motivate action, along with things like commitment, moral compliance, religious principles, and social norms (Silva-

Leander, 2011). Sen thought that preferences are ordered, and he used the term "meta-rankings" to explain this. Metarankings put preference rankings in order and imply that people don't just try to maximize their own utility but also take moral considerations into account. So, not only can preferences be ranked in order to maximize utility under certain constraints, but the person can also think about what to maximize, which may include non-utilitarian things.(Massenberg, 2021).

2.2.1. Identifying Values of Health Economic

In neoclassical economics, individuals demand and produce health, encompassing longevity and the number of healthy days in a given year. Health is a choice variable contributing to satisfaction (utility) and influences income or wealth levels. There are two primary reasons consumers demand health (Grossman, 2017). Firstly, illness is a painful experience that can lead to inefficiency. As a result, health directly contributes to an individual's utility function and can positively impact overall well-being. Secondly, health is viewed as a unique form of human capital. As one's health improves, the number of illness-free days increases. Nowadays, it can generate income (which can ultimately be used to purchase commodities) or leisure that contributes to one's overall satisfaction. Therefore, health is a consumer good and an investment in human capital, which can be utilized in the household's production function. Consequently, health is a significant utility source (Jiang, 2009).

Santerre and Neun also characterize healthcare as an umbrella term for a wide range of products and services meant to promote and sustain a healthy body and mind (Ferreira & Monteiro, 2019). The provision of medical care is a commodity that is manufactured and distributed in the same way as any other good or service. Nonetheless, health care has four distinguishing features that set it apart from other commodities. The vast majority of health care services cannot be seen, smelled, tasted, or felt. second, inseparability: production and consumption occur simultaneously in the majority of circumstances. Third, Inventory: As a result of the inseparable nature of health care, most providers are unable to hold or maintain sufficient inventory to fulfill demand. Inconsistency: the nature and quality of the medical treatments utilized varies from instance to case. Simply put, health care is a commodity of a varied and complex variety (Santerre & Neun, 2012). In terms of health production, however, it is still subject to the law of diminishing returns; as a result, a health production curve with a declining marginal product can be drawn. Evans also points out that health care, in and of itself, can be counterproductive because of the negative outcomes that can result from receiving medical treatment (Jiang, 2009). Despite the inclusion of socioeconomic elements such as wealth, education, and environment, it is vital to note that under the neoclassical paradigm, individual preferences and responsibilities are considered as the primary determinants of health (Jiang, 2009). The Santerre and Neun equations demonstrate this through the health production equation, which shows the maximum amount of health that can be achieved from a specific set of inputs during a given time period. In simpler terms, it outlines how the output (health) relies on the quantity of inputs, such as medical treatment. The generalized short-term health production function for an individual is described by the following formula: Health = H (medical care, technology, profile, lifestyle, socioeconomic status, environment). Health represents the individual's health level at a particular point in time; medical care stands for the amount of medical care consumed; technology refers to the current state of medical technology; profile captures the individual's mental and physical attributes; lifestyle represents a range of lifestyle variables, such as diet and exercise, socioeconomic status refers to an individual's socioeconomic status, and environment(Santerre&Neun,2012).

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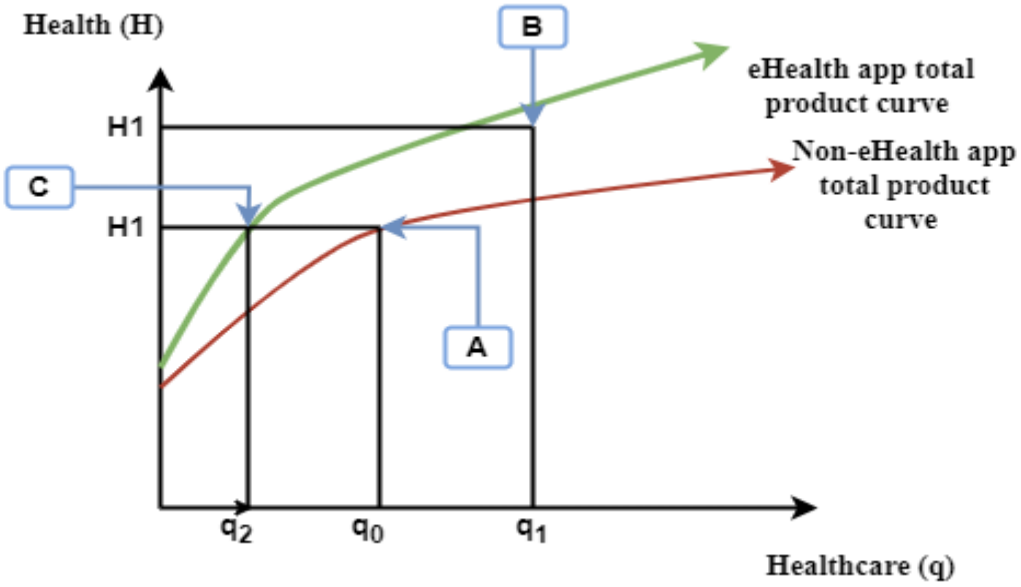

Figure 10. The Effect of Technological Change on the Total Product Curve for Medical Care. Source: Own elaboration adapted from Santerre and Neun (2012).

In the context of health production models, introducing and implementing innovative medical technologies, such as eHealth, can result in an upward pivot and rotation of the total product curve, as illustrated in Figure 10. This occurs because the marginal productivity of each unit of medical care consumed increases. Moving from point A to point B represents a scenario where a new technology boosts the quantity of medical care consumed and improves health outcomes. On the other hand, a transition from point A to point C indicates that the new medical technology does not directly impact health but reduces medical care utilization.

On the flip side, the ethical framework of mainstream neoclassical economics is rooted in utilitarianism (Massenberg, 2021), a normative ethical theory asserting that our ethical duty is to optimize the overall good or utility. Utility encompasses pleasure and suffering or the fulfillment of preferences or interests. Act utilitarianism contends that our moral obligation is to pursue the action, intervention, or policy that maximizes utility in the context under consideration. Conversely, rule utilitarianism maintains that our moral responsibility is to follow the choice aligning with a rule that maximizes utility in a general sense (Bellefleur & Keeling, 2016).

In health economics, utilities represent a cardinal value system that reflects an individual's preferences for different health outcomes. These values are measured on an interval scale, where zero signifies health levels equivalent to death, and one denotes perfect health. In health economics, utilities are typically paired with survival estimates and averaged across a population to derive quality-adjusted life years (QALYs). These QALYs are then utilized in cost-utility assessments of healthcare interventions (Tolley, 2009). But QALYs aren't the only method used in health economic evaluation. Evaluation in the eHealth economy compares intervention costs and outcomes. Economic evaluation uses actual experiments, mathematical models, or both (Lau & Kuziemsky, 2017). And Cost-benefit, cost-effectiveness, and cost-utility analyses (QALYs) are common in the eHealth literature (Bergmo, 2015). But cost-minimization, cost-consequence, input-cost, and cost-related outcome analyses are rarely used (Lau & Kuziemsky, 2017). Table below defined various eHealth economic evaluation.

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Table 4. The valuation of both the costs and outcomes of eHealth.

eHealth economic evaluation	Definition
Cost-benefit analysis	CBA measures the consequences in monetary terms expressed as a net benefit, that is, benefits minus costs. CBA answers the following question: Is the eHealth service worthwhile?(Bergmo, 2015)
Cost-effectiveness analysis	CEA measures the consequences as health changes, for example, blood glucose levels, wound size, disability days avoided, and life years gained. CEA establishes which of two or more alternatives is less costly for at least as much benefit, more effective for equal or lower costs, or is more effective and more costly (in a cost per unit of effect).(Bergmo, 2015)
Cost-utility analysis	CUA measures the consequences as "healthy years," for example, as quality-adjusted life years (QALYs). CUA establishes which of two or more alternatives is less costly for at least as much benefit, more effective for equal or lower costs, or is more effective and more costly (in a cost per QALY).(Bergmo, 2015)
Cost-minimization analysis	examines the costs and multiple consequences in their natural units without aggregation into a single consequence. (Lau & Kuziemsky, 2017)
Cost-consequence analysis	examines the least costly conse-quence among alternatives with equivalent consequences. (Lau & Kuziemsky, 2017)
Input cost analysis	examines the costs of all alternatives but not their consequences. (Lau & Kuziemsky, 2017)
Cost-related outcome analysis	examines the consequences of all alternatives in monetary terms but not the input costs incurred. (Lau & Kuziemsky, 2017)

Source: Own elaboration adapted from Bergmo (2015), and Lau and Kuziemsky (2017).

A full economic evaluation is considered a comprehensive economic evaluation when the costs and outcomes are compared. Complete economic evaluation includes cost-benefit, cost-effectiveness, cost-utility, and cost-consequence analyses. A partial or one-sided economic appraisal is one that focuses primarily on the costs e.g., input cost analysis or the effects without considering the benefits e.g., cost-related outcome analysis. also, by assuming that all outcomes are comparable and centering attention on the least expensive option, cost-minimization is a type of input-cost analysis (Lau & Kuziemsky, 2017).

In general, studies on cost identification aim to evaluate the economic impact of specific medical conditions or health behaviors. The societal cost of a medical illness or health habit is typically broken down into three key components: direct medical care costs, direct nonmedical costs, and indirect costs. Direct medical care costs include medical tests, exams, and administrative expenses. Direct nonmedical costs refer to charges faced by patients and nonmedical staff, such as transportation and home care expenses. Indirect costs are primarily related to time and include the patient's lost time due to injury, incapacity, or death, as well as the lost productivity of caregivers or family members (Santerre & Neun, 2012).

However, Friedman & Wyatt (2005) introduced three additional factors to consider when evaluating the costs of a health program. These factors include time costs, intangible costs (such as pain and suffering), and indirect costs (such as lost productivity). It is essential to factor in the time required for patients to participate in treatment and the value patients place on pain and suffering. While assigning a monetary value to pain and suffering can be difficult, most researchers include it in quality-of-life assessments. When measuring the success of a treatment, it is also essential to consider any lost productivity due to the intervention and disease being treated. Overall, a comprehensive cost evaluation should consider all of these factors from both a patient and societal standpoint.

However, there are benefits compared to the cost. In the eHealth literature, the term "benefit" encompasses a variety of non-financial outcomes. An instance is the phrase "benefits evaluation," in which the benefits may be expressed in dollars or other units, such as hospital length of stay in days or the number of adverse events during a specific period (Lau & Kuziemsky, 2017). The maximization of value in a cost-benefit analysis is the starting point for any study of consumer behavior (H.-W. Kim et al., 2007). An adequate understanding of

value perception is necessary for conducting a cost-benefit analysis, which is the process of weighing the relative merits of potential gains (values) and losses (costs) in an effort to maximize value (Boksberger & Melsen, 2011). In contrary, cost-effectiveness analysis examines data for whole patient groups, evaluating the health benefits and financial costs of various treatment alternatives. The purpose of cost-effectiveness analysis is to guide policy so that therapies that enhance patients' lives are rewarded equitably and neither patients nor society overpay for care that does not give a substantial benefit(Review, 2018). Although there are different evaluation methods for eHealth technologies, healthcare concerns still stem from three main sources: price, quality, and access. (Blendon et al., 2006). Canada Health Infoway (Infoway) developed the "Infoway benefits evaluation (BE) framework" see Figure (11) to address these concerns and assess the broader effects of eHealth programs. The BE Framework incorporates all six dimensions of the updated DeLone and MacLean Success Model, which includes system, information, service quality, use and user satisfaction, and net benefits. Within the framework, there are a total of 20 categories and 60 subcategories of evaluation measures that are clearly defined (Lau & Kuziemsky, 2017). The BE framework comprises three elements of quality, with "system quality" referring to the technical characteristics of Health Information Technology across three areas Figure 11. The term "information quality" refers to the features of the system's data and is divided into two categories: the quality of the content and its availability. "Service quality" relates to Health Information Technology implementation, training, and continuing staff support, and includes a responsiveness subcategory.

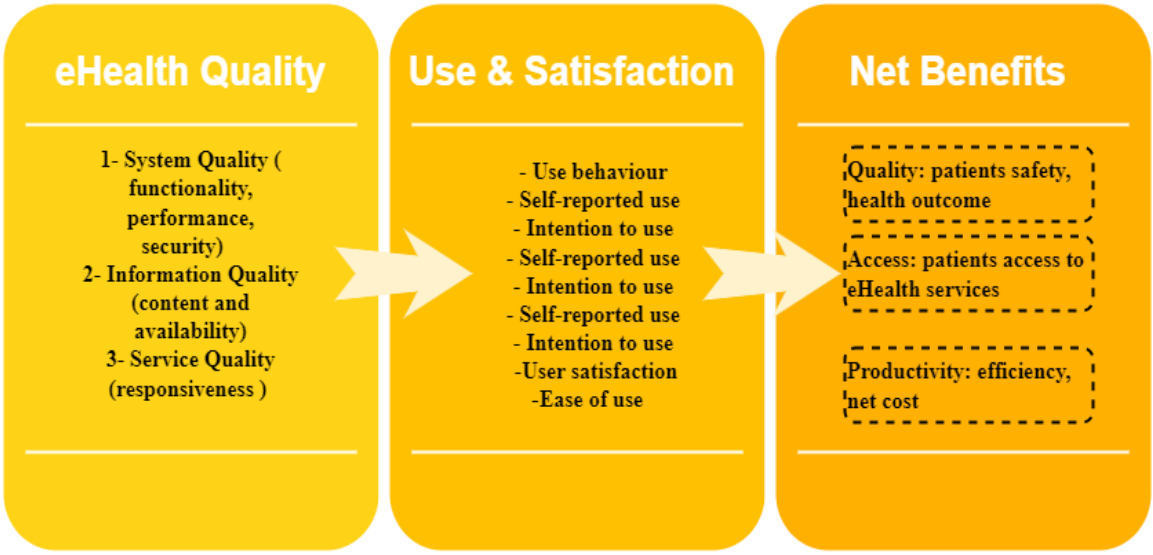

Figure 11. Infoway benefits evaluation (BE) framework.
Source: Own elaboration adapted from Lau and Kuziemsky (2017).

Also, in the Use and User Satisfaction dimension of the BE model, there are several indicators that measure use and user satisfaction toward health information technology, e.g., "frequency, duration, location, and flexibility" indicate using HIT. In addition, user satisfaction encompasses the extent to which users feel fulfilled from using the HIT to do their activities by, for instance, decreasing costs, enhancing usability, and ease of learning. The final dimension of the BE framework is the net benefits dimension, which has three categories of measures on care quality, access, and productivity. And each of them has several indicators, see Figure (11). However, the primary disadvantage of the BE framework is that it has only been utilized in the Canadian healthcare system and in a few studies outside of Canada (Lau & Kuziemsky, 2017). In addition, Porter attempts to redefine healthcare in terms of maximizing value for patients in order to address three healthcare problems (cost, quality, and outcome)

(Porter, 2010). Also, delivery and implementation mechanisms in healthcare today are more restricted than scientific knowledge. in other words, the fundamental issue with present-day healthcare in the United States and globally is the unacceptable gap between the high costs and low quality that result from them. Michael Porter, an economist at Harvard, concluded that the issue is not a lack of hard work, incompetence, or scientific advancement, but rather the design of the healthcare delivery system itself, which results in increased costs and inconsistent quality of service (Badash et al., 2017; Porter, 2010).

Porter argues that healthcare providers operate within an outdated market-based framework that aligns differently from modern medicine. In other words, competition in the current volume-based healthcare system does not translate to patient value, as financial success for providers does not necessarily lead to improved patient health outcomes. Porter believes that healthcare should prioritize value-based services, measuring the value by the health outcomes achieved per dollar spent. To establish such a value-based system, reimbursement, service cost, and patient-valued health outcomes should be considered (Badash et al., 2017).

Porter proposes six guiding principles to establish a value-based healthcare system, including setting up integrated practice units (IPUs) that provide comprehensive care for a patient's specific condition, tracking costs and outcomes for each patient, and transitioning to bundled payments for acute medical conditions, chronic care, or primary and preventive care for specific conditions. Other principles include extending healthcare providers' reach through satellite locations and partnerships with community providers, standardizing protocols across sites and integrating healthcare delivery across multiple facilities, and supporting these changes with a patient-centered information technology platform, such as eHealth, that can easily manage medical data (see Figure 12) (Badash et al., 2017; T. Lee & Porter, 2013; Mathiasen & Frandsen, 2017).

The adoption of value-based healthcare has been significant, with most Western healthcare systems implementing it over the past decade. In the US, CMS runs a value-based hospital buying program, and in 2017, the NHS Right Care program supported VBHC in promoting value-based healthcare at a population level, enhancing patient outcomes, and providing considerable cost savings (Groenewoud et al., 2019). The Economist Intelligence Unit recently conducted a review of the commitment of healthcare systems in 25 countries to the VBHC model's essential components across four categories, including context, policy, and institutions for value in healthcare, measuring outcomes and costs, integrating and patient-focused care, and outcome-based payment approach (Shah, 2016).

While many believe that Value-Based Healthcare (VBHC) can improve healthcare, it may go against four essential principles in healthcare:

1. VBHC does not take into account patients' values.
2. Neglects the importance of caring
3. Relies too heavily on professionals' accountability.
4. Undermines solidarity.

Essentially, VBHC's narrow definition of value fails to consider patients' unique values and life circumstances and fails to recognize the intrinsic value of compassionate care. Furthermore, VBHC's focus on outcomes and management, as well as choice and exit, could compromise the trust in healthcare professionals and the sense of community among patients (Groenewoud et al., 2019).

Previous models show that the incorporation of an economic perspective into health policy and planning is becoming increasingly recognized. As a method for assessing the relative costs and health gains of diverse (and often competing) health interventions, cost-effectiveness analysis (CEA) has been utilized as a tool to address concerns of efficiency in the allocation of limited health resources. Cost-effectiveness data can be used in conjunction with other types of data to help guide various policy decisions, as evidenced by the experiences of several

countries. In Australia, for instance, it has been used to determine whether medications qualify for government funding (Hutubessy et al., 2003).

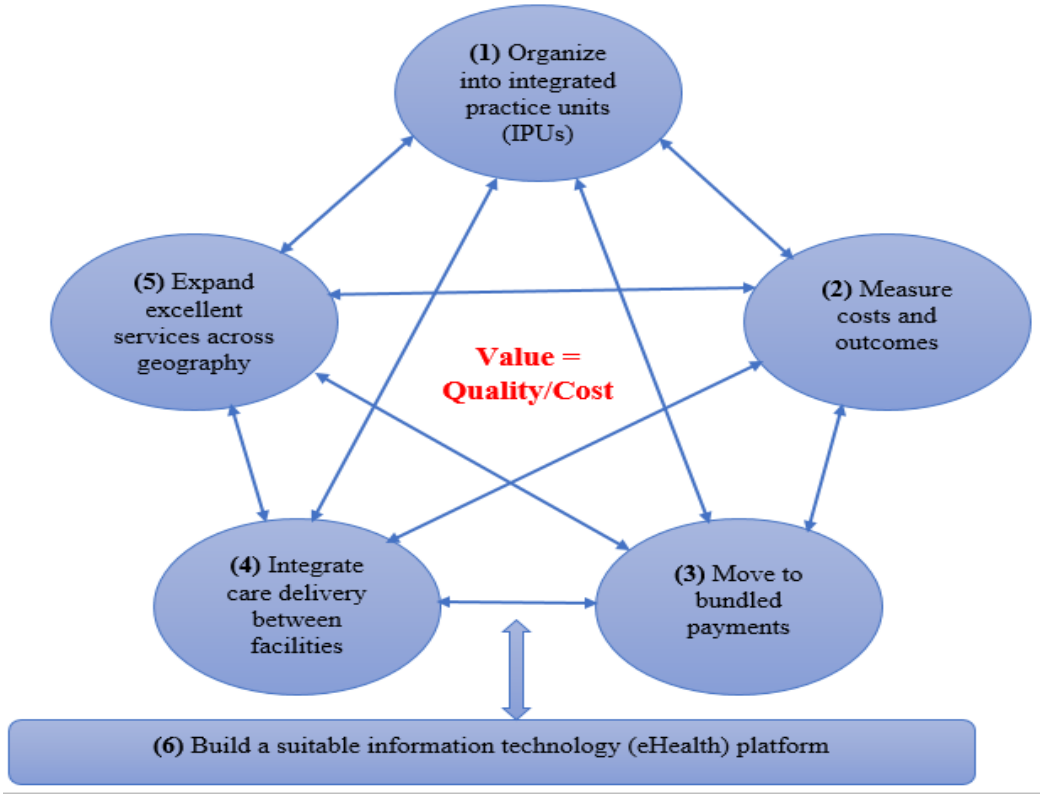

Figure 12. Porter' Value-based Healthcare model (VBHC).
Source: Own elaboration adapted from Badash et al. (2017), and Valera Sosa (2017).

Nonetheless, in 2018, Lakdawalla and colleagues developed a comprehensive framework to expand our understanding of what constitutes value in healthcare and to encourage further research into incorporating additional value factors into cost-utility analysis (CUA) or CEA. They curated a list of components ranging from traditional to innovative and examined them in relevant literature, including economic, clinical, and ethical studies. As illustrated in Figure (13), the components highlighted in green are considered fundamental to value assessments, while those in light blue are frequently used but inconsistently evaluated. The elements in dark blue are more unique and rarely taken into account. The blue lines represent value concepts from the perspective of typical payers or health plans, while the red lines represent concepts considered from a broader societal standpoint (Lakdawalla et al., 2018).

As a result, CEA considers only the additional costs and benefits (Hoch & Dewa, 2008). Present and future costs or savings should be taken into account, provided they are causally related to the interventions of interest. The net incremental cost of treatment is the direct cost of treatment minus any savings on future costs that may result from the treatment being implemented now. Patient (or potential patient) benefits, which are the focus of CEA, are quantified in light of the health care technology at hand. It's important to think about the wide range of health benefits. A patient's life expectancy, mobility, experience of pain, quality of sleep, and a nearly infinite set of other health-related factors could all be affected by medical technology. It would be ideal if we could quantify these shifts using a standard metric. Health economists routinely use QALY as a summary measure of health outcomes for economic evaluation (Whitehead & Ali, 2010). The value of a QALY gain can be determined using either the "stated preference" or "revealed preference" method (Lakdawalla et al., 2018). However, there have been a few ethical objections to the use of CEA in decision-making. Among them are:

1) Disagreements regarding the use of QALYs.
2) The concept of "distributive justice;"
3) An insufficient valuation (Kim & Basu, 2021).

Most utility assessment tools, such as "QALYs," don't do a good job of taking into account the productivity effect, and the incremental cost-effectiveness ratio (ICER), can't include the cost of consumption or earnings in the same future years without making the ratio inaccurate (Nyman, 2018). Thus, certain researchers have posited that the value of productivity could be incorporated into the base gain of QALYs. These researchers acknowledge that the costs or benefits in question represent the economic worth of the time spent in both formal and informal labor markets by individuals such as older adults who may not traditionally participate in formal labor markets, yet still contribute to informal ones by volunteering their time for a variety of activities. By translating these productivity benefits into QALYs, they can be factored into the CEA. Although this technique is logically justifiable, it also raises equity concerns. In contrast, the most neutral method "in terms of distributive fairness" would be to value all productive time in society at a generic mean wage plus fringe benefits(Lakdawalla et al., 2018).

As seen in Figure 13. Adherence is "the degree to which a patient act in accordance with a dosing regimen's prescribed interval and dose" (Mathes et al., 2014). Some medical technologies have advantages over the ones that are already available, such as simpler dosing schedules, etc. The value of medical technology as a whole may be affected by how well these things help patients follow their treatments and improve their health. These factors that make it easier for people to stick with a plan will affect the value assessment because they have an effect on both how much the technology costs and how well it works. On the effectiveness side, technologies that make it easier for people to use them may directly improve their health benefits and get more people to use them. On the cost side, there is a direct and immediate effect of the cost of the technology going up (for example, the cost of a drug going up if more people take it or refill it), but there is also an indirect and longer-term effect of reducing the use of medical resources and costs that come from that (via improved health outcomes) (Lakdawalla et al., 2018).

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Figure 13. Elements of value.
Source: Own elaboration adapted from Lakdawalla et al. (2018)

The value of diagnosing a disease is another thing that is usually included in HTAs. Avoiding a treatment that doesn't work for people who don't respond well would save money on treatment costs (like the cost of the medicine) and the costs of treatment-related side effects. Also, it could help people who don't respond well to treatments move faster to better alternatives. At the same time, some diagnostics might be better at predicting how well a treatment will work. In such scenarios, the introduction of diagnostics can amplify usage, enhance efficacy, and boost overall value by incentivizing individuals to utilize the drug in cases where the likelihood of success is higher. Furthermore, if there were greater certainty regarding individuals' response to the drug at a population level, it could lead to improved adherence rates and heightened participation, ultimately generating more value (Balogh et al., 2015; Lakdawalla et al., 2018). When cost-effectiveness analysts look at infectious diseases like COVID-19, they usually look at the benefits of a medical intervention that go beyond the people who are treated. When infectious diseases are treated, they are less likely to spread to healthy people, who also benefit from this. This is an example of what economists call a "external factor," which is when someone's actions cost others (a negative external factor) or help others (a positive external factor) (a positive external factor). From a social point of view, treatments for infectious diseases like vaccinations and quarantines have all these good effects on the outside world, even though they cost money. Moreover, mitigating the apprehension linked to the potential transmission of the disease could prove advantageous for society. Concern affects all individuals who might come into contact with the illness, not only those who are already sick or have been exposed in the past. Consequently, the personal significance of evading anxiety may escalate in the context of value assessments. (Kellerborg et al., 2020; Lakdawalla et al., 2018; Orangi et al., 2022).

Lakdawalla and colleagues (2018) identified two elements in their inventory of value that relate to how people perceive risk: insurance value and value of hope. The insurance value of medical technology encompasses two aspects: protection against physical harm and protection against financial harm. On the other hand, the value of hope refers to situations where patients are willing to take risks not necessarily to increase their projected quality-adjusted life years (QALYs) but because they are "risk lovers." Reed et al. (2021) have presented empirical evidence highlighting the significance of hope as an additional dimension when evaluating treatments that have the potential to significantly prolong survival in a subgroup of patients beyond the scope of QALYs. However, their analysis also reveals considerable variation in how individuals value these treatments.

Figure 13 also displays the Real Option Value (ROV) component, which is a novel value factor that is formed as medical technology extends the lives of patients, creating possibilities to take advantage of future medical advancements prior to death(W. Lee et al., 2021). But this element is rarely accounted for or represented in intervention-specific forecasts of QALYs gained, which take into account how long a person is projected to live and how beneficial their health is at any point in their remaining lives. Other novel elements of value also focus on how the severity of disease might affect the value of treatment . This idea is closely related to the idea of insurance value, which also means that a given improvement in health is worth more to a person whose health is worse to start with. The long-term effects of a new technology on patients in the future are another factor of value that gets a lot of lip service but gets little attention. A drug with a novel mechanism of action, for instance, might not be very valuable on its own, but understanding this mechanism could one day lead to more effective medications, perhaps even for entirely different diseases. This is what is called "Scientific Spillovers" (Lakdawalla et al., 2018).

On other hand, People care about health care equity and others' well-being. Regardless of how you slice it (socioeconomic, demographic, geographical, etc.), equity exists when there are no inequities that can't be addressed or corrected. When we talk about "health equity" or "equity in health," We are referring to the idea that every individual deserves an equal chance to reach their maximum level of good health, and no one should face any hindrance in achieving this goal (Hill-Briggs et al., 2020). Furthermore, Lakdawalla et al. (2018) distinguish between altruism and equity. In altruism, some public programs persist due to the public's willingness to finance health care for low-income individuals. Different groups, such as rich and poor groups, or the well-off and the sick, may wish for more equitable outcomes. As opposed to altruism, we call this "equity." But some efficient outcomes may be inequitable, and vice versa. Even though the possible trade-off between efficiency and fairness is complicated, it is even harder to figure out because different ideas of fairness can involve trade-offs.

However, In their 2017 study, Cookson and colleagues detail two critical ways CEA can tackle health equity concerns. Firstly, equity impact analysis can help to identify how costs and effects are distributed across different equity-relevant variables such as socioeconomic status, location, ethnicity, sex, and disease severity. Secondly, equity trade-off analysis can quantify the trade-offs between improving health outcomes and other equity objectives. One approach to analyzing equity trade-offs involves calculating the cost of alternative options that may be fairer but less cost-effective in terms of forgone health benefits. Using equity weights or criteria may also determine the level of care required to achieve more significant equity while accepting less cost-effective solutions (Cookson et al., 2017).

On the other hand, people place a high priority on non-health gains, as indicated by their willingness to pay for such services, but additional non-health-related benefits are not accounted for in cost-effectiveness analyses. Consequently, when assessing interventions based on cost-effectiveness, it is essential to recognize that such comparisons only evaluate

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their effectiveness in enhancing health. If non-health benefits are to be considered, including them in the discussion for all interventions, not just a limited few, is essential.

In certain studies, researchers account for additional expenses, such as the value of the time patients and family members spend seeking treatment or the cost of transportation to access facilities. Incorporating supplementary expenses would elevate the cost per unit of health benefit, leading to a decrease in the intervention's cost-effectiveness. If the interventions share common attributes, such as being provided at identical venues, accounting for these additional expenses would not alter the interventions' ranking. Nevertheless, evaluating dissimilar interventions may yield varying outcomes, even if the ratios are comparable in other aspects (Jamison et al., 2006).

2.3. EHEALTH APPLICATION

Insufficient healthcare outcomes result in higher rates of illness and mortality, hence limiting a country's economic development (Li et al., 2013). Thus, the World Health Organization (WHO) defined health in the preamble to its 1948 Constitution as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." This definition not only sets the standard for medicine as the "art of healing" but also invites us to ponder the role of "eHealth" technology in advancing our collective health objectives while transforming our connection to personal wellness (Kleinpeter, 2017).

Despite the fact that the term "eHealth" is still commonly used to describe novel approaches to medical care, the idea has been around for some time. The remote monitoring of Yuri Gagarin's heart, the first human in space, is considered the beginning of eHealth (Ehrismann & Stegwee, 2015).

Today, the term has become so expansive and varied that its precise meaning is frequently unclear (Ehrismann & Stegwee, 2015). A thorough assessment of published definitions of the term "eHealth" produced a total of 51 distinct definitions as far back as 2005. Eysenbach's definition was the most frequently cited: eHealth is a rapidly developing field that combines medical informatics, public health, and business. It pertains to the provision and improvement of health services and information using the Internet and associated technologies. However, eHealth is not just a technological advancement, but also a mindset, a way of thinking, an attitude, and a dedication to interconnected, worldwide perspective with an aim to advance healthcare on a local, regional, and global scale through the use of information and communication technology (T. Shaw et al., 2017). This term just scratches the surface of the topic, as a mental state can contain virtually anything. Additionally, it contains normative implications such as "improve." Another definition by the Dutch RVZ counsel is: "eHealth is the use of new information and communication technologies, specifically internet technology, to support healthcare." Despite being more specific, this term includes a large array of services (Ehrismann & Stegwee, 2015).

In response to calls in the existing literature for a more contemporary, actionable definition of eHealth technologies, Shaw et al. (2017) conducted interviews with experts in the eHealth field to develop a framework for understanding eHealth (as depicted in Figure 14). The resulting model consists of three interrelated domains:

1. Empowering individuals to manage their health through digital technologies
2. Facilitating communication and collaboration among healthcare stakeholders through digital technologies
3. Leveraging data to improve health outcomes and healthcare services

Each of these domains highlights the various ways digital technologies can be utilized in the healthcare context (T. Shaw et al., 2017).

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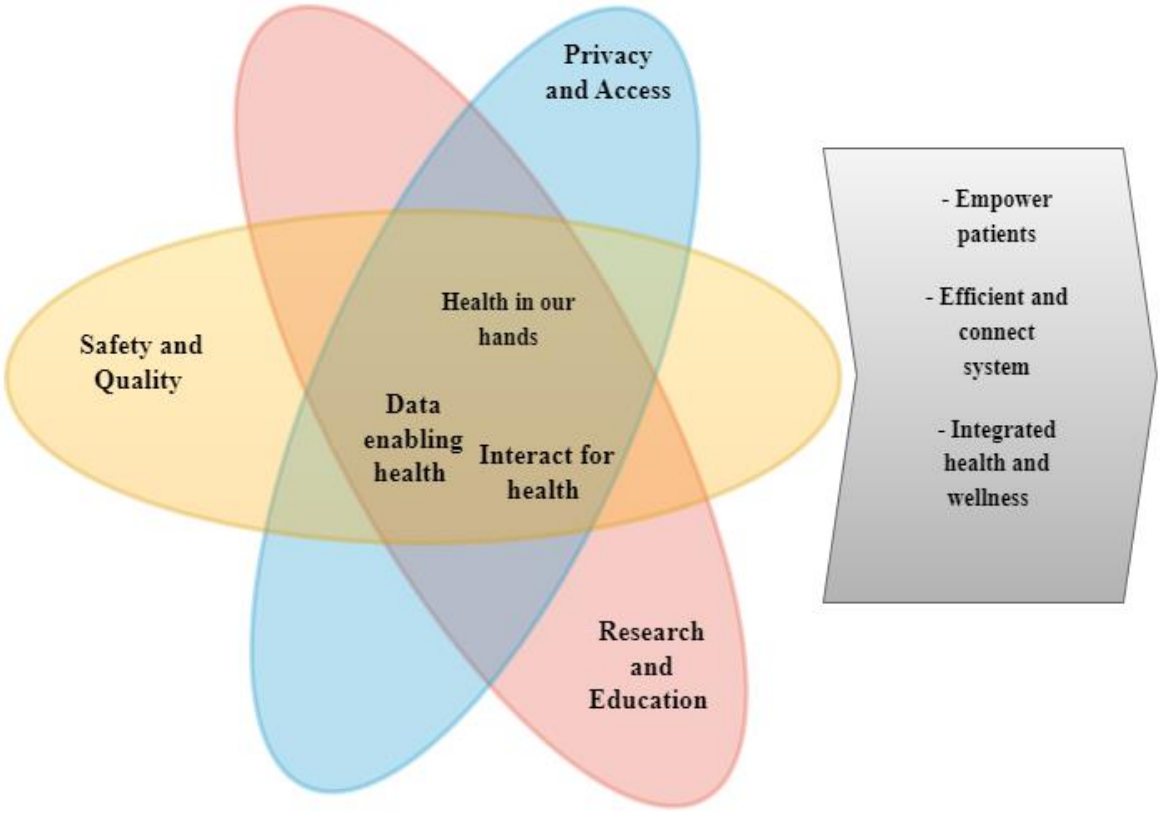

Figure 14. Dimensions of eHealth.
Source: Own elaboration adapted from Shaw et al. (2017).

On the other hand, Barbabella and colleagues categorized various services as "eHealth." Their definition covers a range of services, including electronic health records (EHRs), Health portals, Personal health records (PHRs), health information systems, remote monitoring and consultation services such as telehealth, telemedicine, and telecare, as well as tools for self-management and health data analytics (Barbabella et al., 2017). As becomes clear from these examples, eHealth includes patient-oriented services(Ehrismann & Stegwee, 2015).

Recent studies reveal that eHealth is increasingly influential in providing healthcare worldwide, enhancing the efficiency and responsiveness of health systems to meet people's expectations and requirements (WHO, 2022). Moreover, the global eHealth market is projected to grow from $40.82 billion in 2017 to $132.35 billion by 2023, boasting a Compound Annual Growth Rate (CAGR) of 18.2% (Zheng et al., 2021).

Despite great hopes and various initiatives in the field of eHealth, the installation and use of eHealth apps on a national scale are not yet widespread. There is currently no comprehensive understanding of patients' attitudes toward eHealth (Hofstede et al., 2014). It's also worth noting that social and human factors, as well as privacy and trust, have been identified as additional barriers to successful eHealth adoption and use(Hoque et al., 2017).

An example of this can be seen in the United Kingdom, where the National Health Service (NHS) is currently working towards implementing a nationwide EHR system. This decision comes after the dismantling of the first attempt in 2011 due to various issues, including concerns over patient confidentiality. The NHS acknowledges that previous efforts failed partly because of the need to protect patient privacy, as outlined in the Information Governance Review. Despite the potential benefits of sharing personal health information, maintaining confidentiality remains a top priority (Cherif & Mzoughi, 2022).

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2.4. PUBLIC VALUE THEORY

The concept of public value was introduced by Mark Moore, a professor at Harvard's Kennedy School of Government. It's a new approach to managing public organizations that helps managers focus on creating value for citizens. In simple terms, public value means the benefits that people get from the government's actions and services.

Public managers, according to Moore, should concentrate on generating public value. Moore contends that public managers should not rely on the New Public Management (NPM) model that was regarded best practice in the 1980s and 1990s. Instead, they should focus on satisfying individual and community needs. On the other hand, Moore (1995) argues that NPM's quantitative indicators often fail to address public service quality's basic, intangible difficulties. Many academics and specialists are paying attention to the concept of public value (Valle-Cruz, 2019; Raus et al., 2010). For the first time, Moore's approach to public value management shows that it is possible to think about public value in an entirely new way (Panagiotopoulos et al., 2019; Hefetz & Warner, 2004).

Overhauling the public sector is a widespread phenomenon globally (Sami et al., 2018). The public sector has transformed from traditional public administration to New Public Management (NPM) and, in recent times, to public value management (Moore, 1995; O'Flynn, 2007).

During the 1980s, scholars from the United Kingdom and Australia introduced the term "new public management" (NPM), intending to infuse the public sector with "businesslike" and efficient practices borrowed from the private sector (Hood & Jackson, 1991). As in the private sector, where "customer service" is emphasized, NPM reforms frequently highlighted "the primacy of service users or consumers in the public sector." Reformers of the NPM experimented with decentralized service delivery models so that local agencies could deliver programs or services with greater freedom. In some cases, e-government-based NPM reorganizes and centralizes a service or program to reduce costs(Santiago III, 2018).

Although NPM had a had a substantial influence on management nd policymaking in the 1990s, many researchers believe it has reached its peak (Conteh & Roberge, 2013). Patrick Dunleavy and other academics argue that New Public Management is becoming obsolete due to a separation between "customers" and their institutions. Scholars cited the Digital Era and the growing significance of technology as the factors that render NPM obsolete (Dunleavy et al., 2006).

Moreover, a prevalent problem associated with New Public Management (NPM) is its evaluation of public service efficiency, which relies on the average cost of processing a specific output rather than considering alternative outputs that hold value for citizens (Omar, 2015). For instance, Raus et al. (2010) emphasize that "evaluating the cost-effectiveness of a government website gives a quantity of information rather than the utility and relevance of the information to the user."

This instance illustrates that enhancements in efficiency do not contribute to improving public value within this context. Given that the NPM approach emphasizes output over outcome, and public managers often need help to grasp the broader perspective beyond the specific services they provide, leading to a lack of coherence in the public services sector (Coats, 2006).

As a means of addressing the limitations of NPM and gaining greater insight into government performance, the notion of "public value" has emerged. By comparing and contrasting the key features of the public value management paradigm with those of NPM, Table (5) sheds light on their primary differences. O'Flynn (2007) notes that NPM is focused on outcomes, competitive, and post-bureaucratic. According to this model, public managers' objectives were predicated on meeting predetermined performance standards.

Within the public value framework, public managers are tasked with achieving many objectives, surpassing performance metrics. These include fostering provider networks to generate public value, cultivating and upholding public trust, and accommodating collective and individual citizen preferences. These goals align seamlessly with the paradigm's emphasis on cultivating relationships rather than just producing results.

Also, the public's values are measured using collective preferences rather than individual preferences in the NPM. Priority was given to effectiveness and economy in the NPM paradigm, which reflected government activity's new economic context and citizens' recasting as clients. Public managers in this paradigm have various objectives, including specific service goals and overarching outcomes, as well as building and preserving public trust and credibility. A shift away from simple performance contracts to more complex systems is required to keep up with these kinds of transformations. More pragmatic selection of providers to deliver public services is recognized as a more effective way to maximize public value in the context of this paradigm.

Table 5. Paradigms of Public Management

	New Public Management	Public Value Management
Characterization	Post-Bureaucratic, Competitive Government	Post-Competitive
Dominant focus	Results	Relationships
Managerial Goals	Achieve agreed performance targets	Multiple goals including responding to citizen/user preferences, renewing mandate and trust through quality services, steering network
Definition of the Public Interest	Individual preference are aggregated	Collective preferences are expressed
Performance Objective	Management of inputs and outputs to ensure economy and responsiveness to consumers	Multiple objectives are pursued including service outputs, satisfaction, outcomes, trust and legitimacy
Dominant Model of Accountability	Upward accountability via performance contracts; outwards to customers via market mechanisms	Multiple accountability systems including citizens as overseers of government, customers as users and taxpayers as funders
Preferred System of Delivery	Private sector or tightly defined arms-length public agency	Menu of alternatives selected pragmatically

Source: Own elaboration adapted from O'Flynn (2007).

In his 2014 analysis of Mark Moore's publication "Recognizing Public Value," Shayne Kavanagh noted that Moore's "strategic triangle" provides a valuable starting point for comprehending public value (see Figure 15). The strategic triangle demonstrates that public value arises when a particular strategy or action has democratic legitimacy (such as community support), endorsement from the authorizing environment (like a governing board), and when the government has the operational capability to execute the strategy or action effectively. Figure 15 also includes a feedback mechanism, indicating that creating public value generates

legitimacy and support (for instance, increased trust from citizens and elected officials) and improved operational capacity (for example, greater ease in obtaining funding and other resources) (Kavanagh, 2014).

By utilizing the strategic triangle as a guide, public value can be maximized by aligning the public value chain with the arrows that connect legitimacy and support to operational capacity and, ultimately, to public value. Through analyzing the current value chain, public managers can modify processes and reduce cost per unit of value. The "Public Value Account (PVA)" is a valuable tool for measuring performance, as it not only tracks outcomes but also the contributions of various individuals throughout the process (Moore, 2013). To truly create value, public authorities must consider the entire value chain, from inputs to production processes (such as policies, programs, and activities) that shape inputs into outputs, ultimately benefiting customers (such as citizens or beneficiaries) and achieving positive social outcomes. It is important to note that traditional line item budgeting tends to focus solely on the "inputs" portion of the value chain (Yotawut, 2018).

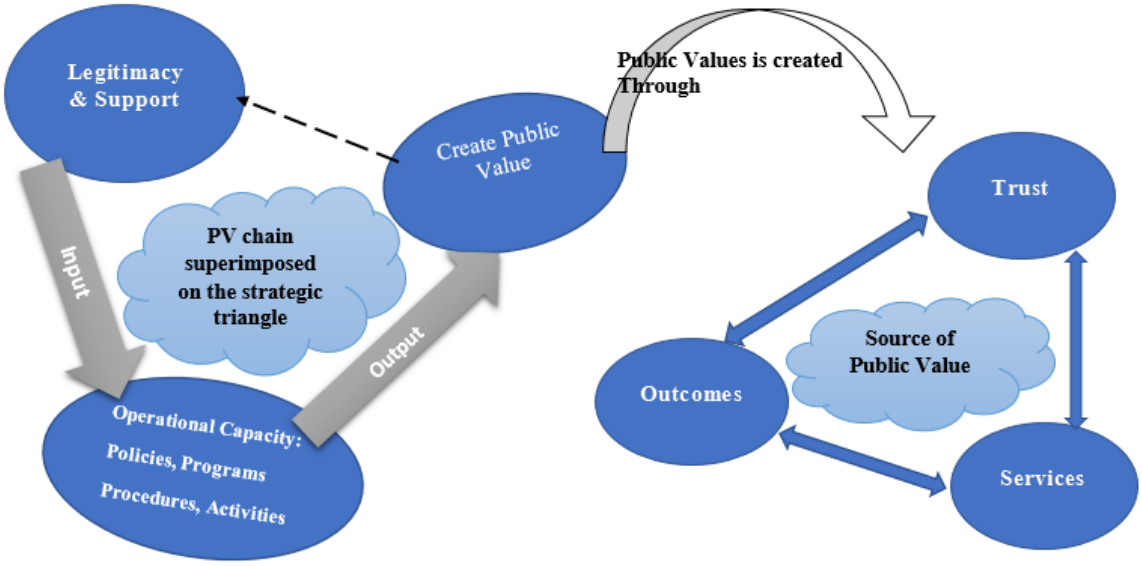

Figure 15. The public value chain superimposed on the strategic triangle and public value main sources.
Source: Own elaboration adapted from (1995, 2013).

On the right side of the figure 15, according to Moore (1995), the paramount objective of public sector programs and activities is to generate public value, which should serve as the guiding principle for public organizations. Moore's model suggests that executives must concentrate on three key areas to achieve this goal:

1. Services: delivering high-quality services at a reasonable cost
2. Outcomes: achieving favorable results
3. Trust: fostering trust between the government and its citizens.

Despite the fact that Kelly et al. (2002) acknowledge that the categories overlap, they propose that the categories provide a suitable framework for considering the aspects of public value. Numerous academics and practitioners are focusing on the notion of "public value" (O'Flynn, 2007). in addition to the fact that it has "gone beyond the academy to practitioners and think tanks" (Moore, 2013). Moore's public value management strategy is an innovative departure from NPM techniques that emphasize measurable quantitative outputs(Hefetz & Warner, 2004).

Concepts related to public value, such as the strategic triangle, the authorizing environment, the public value chain, and the emphasis on public sphere results, offer valuable tools for public managers to comprehend and reframe challenges effectively, facilitating

decisive and efficient action (Benington & Moore, 2011). Academic interest in public value has now caught up with practical boundaries, emerging as an alternative to classic public administration and innovative public management paradigms. This interest expands across various disciplines, including philosophy, psychology, political science, ecology, and management science, and spans different nations, traditions, and cultures (Benington & Moore, 2011; Bojang, 2020). However, there are diverse perspectives on the concept of public value, leading to a split in the academic community. Some actively seek to explore it (e.g., Silverman, Alesina & Angeletos, Talbot, Alford & O'Flynn, Australian Bureau of Statistics). In contrast, others reject it (e.g., Williams and Shearer, Rhodes and Wanna, West and Davis, Dahl and Soss) (Omar et al., 2011).

Critics have raised concerns about the Public Value concept, arguing that it is both normative and pragmatic in nature (Alford & O'Flynn, 2009). Specifically, Rhodes and Wanna have called into question whether the approach is a paradigm, a model, a heuristic device, or even a tale, suggesting that it may be too broad to be useful for everyone. They have also criticized Moore and his followers for undervaluing politics and elected officials, overemphasizing the role of public managers, and placing too much faith in public organizations, private-sector experience, and public servants' virtues (Bryson et al., 2014). While we believe that Rhodes and Wanna's rejection may be premature and subject to rational debate, there remain concerns about the relative absence of empirically testable assertions and the seeming silence of public value on matters of power and heterogeneity. These issues must be addressed to ensure that the Public Value concept remains a helpful teaching tool for public administration and can provide a comprehensive philosophy of public enterprise and organization (I. Williams & Shearer, 2011).

In addition to the ambiguity of public value concepts, it's important to assess if public value is being mobilized to answer society's toughest concerns, especially so-called "wicked problems" such as global migration (refugees), financial crises, and health care (see Chohan, 2021; Head & Alford, 2015; Rouse, 2022).

Dahl & Soss (2014) vigorously challenge Moore's theory of generating public value. They argue that Moore's comparison of public value to corporate profit risks promoting the de-democratization and marketization effects of neoliberalism. In their view, this approach reduces democratic involvement to merely instrumental terms and treats public value as a commodity. As a result, public administrators may unwittingly contribute to the "democracy downsizing" phenomenon (Crenson & Ginsberg, 2002).

Proponents of the public value concept contend that, despite its ambiguity and the need for further exploration, it remains a valid theoretical framework (Aoki et al., 2022; Wang, 2022). Public value theory shifts the focus from government service producers to consumers, changing managerial priorities from service optimization to efficient and effective services that ensure citizen satisfaction (MacLean & Titah, 2022). Cordella & Bonina (2012) emphasize that public value examines value creation from the public's perspective, not solely from the government's standpoint as a service provider. This perspective is crucial due to the diverse interests of stakeholders and the various roles of the public as both beneficiaries and critics of government operations (Grimsley et al., 2007). The challenge, as highlighted by Goh & Arenas (2020), lies in the trade-offs that governments must make. For example, balancing cost savings with introducing new services can take time and effort. Public authorities must recognize when the value created for specific groups outweighs the value lost by others (MacLean & Titah, 2022).

Jacobs contends that public administration has historically prioritized purpose and values, but what distinguishes public value is its dual focus. Firstly, despite their strengths, traditional public administration and new public management fail to address the demands of networked governance, leadership, and management, mainly when the goal is to serve a diverse array of public values, encompassing but not limited to efficiency, effectiveness, and equity. Secondly,

Jacobs argues that terms like "public interest" and "commonwealth" are overly restrictive, while terms like "common good" and related expressions are too vague. In contrast, "public value" is more pragmatic and encompassing (Bryson et al., 2014).

In contrast, John Alford provides a compelling counterargument to Rhodes and Wanna's critique. Alford begins by asserting that Rhodes and Wanna have intentionally distorted Moore's ideas and provides evidence from Creating Public Value to support his claim. He challenges their outdated and debunked notions about the separation of politics and administration, highlighting the intricate interplay between politicians and public managers in crafting policies and implementing new initiatives to address evolving public needs (Benington & Moore, 2010).

Finally, there are various ways to generate public value, and they can be used in positive or normative ways. Previous research, such as Bryson et al. (2014), has explored this topic. Andersen et al. (2013) investigated the relationship between public values and public service motivation, finding that four value dimensions strongly correlate with a PSM dimension in a theoretically sound manner. Meynhardt & Metelmann (2009) studied middle managers in the German Federal Labor Agency, discovering they shared similar views to Moore's public value entrepreneurs. MacLean & Titah (2022) analyzed sixty empirical studies on the effects of e-government using public value theory. They found that the most commonly researched impacts were productivity for taxpayers and clients, client satisfaction and service quality, and increased trust and communication for citizens.

The issue of public value is of tremendous relevance in the current evolution of studies on public administration (Esposito & Ricci, 2015), and the study of public values has received more scholarly attention (Bozeman; de Graaf & van der Wal; Meynhardt; Andersen et al.; Fisher & Grant; Hartely et al.).

As mentioned earlier, Mark H. Moore coined the phrase "public value" in his 1995 book, Creating Public Value, where he defines it as "a framework that helps us connect what we believe is valuable... and requires public resources, with enhanced ways of knowing what our "publics" value and how we engage with them." having received limited attention during its early years of publication.

During the early 2000s, the idea of public value gained prominence in the administration of Tony Blair. Subsequently, this concept expanded beyond the United Kingdom to encompass other Westminster systems, including Australia and New Zealand, and eventually reached the European Continent and developing nations (Bryson et al., 2014; Sami et al., 2018; Witesman, 2016). Furthermore, prominent advocates of public value content in Europe have been public broadcasters like the British BBC, German ZDF, and Austrian ORF (Diefenbach, 2011).

As articulated by M. Moore in 1995, public value refers to the significance or worth that citizens' attribute to the outcomes of government policies and their interactions with public services. The fundamental principle of the public value concept is that the value perceived by citizens should shape the functioning of public organizations in delivering public services, underscoring the ultimate objective of public programs, including e-government initiatives, which is to generate value for citizens (Meynhardt, 2009; M. Moore, 1995). Moreover, O'Flynn (2007) emphasizes that governments must consider citizens' perspectives when delineating public value. Public value is not solely derived from outcomes but is also shaped by processes that can foster trust and justice.

Furthermore, the concept of "public value," primarily derived from public administration and Moore's formulation in 1995, revolves around citizens' collective expectations of government and public services (M. Moore, 1995). According to Castelnovo (2013), government activities are not typically designed to impact specific individuals directly but aim to influence stakeholder groups and their interests. Castelnovo (Ibid) emphasizes the necessity of focusing on distinct stakeholder groups and their particular interests in examining public

value. For instance, citizens are viewed not merely as a general populace but as individuals in various stakeholder roles, such as policymakers, civil servants, participants, and taxpayers.

Contrarily, Meynhardt proposes that the values defining the quality of the bond between an individual and "society" form the foundation of public value. Although individuals' evaluations of this relationship are subjective, Meynhardt argues that when given intersubjective weight, these assessments become objective and may meet Bozeman's criteria for a reasonable normative consensus. According to Meynhardt, public value involves evaluating how relationships within the public sphere impact the fundamental needs of individuals, collectives, and the community. It also encompasses value derived from the public's experiences (Bryson et al., 2014).

Contemporary examinations of public value can be categorized into two main streams, as identified by Mintrom & Luetjens (2017). Bozeman, a prominent figure in the literature on public value, directs his focus toward the policy or social level. He posits that a society's public values establish a normative consensus concerning citizens' entitlements and rights, their societal, state, and mutual obligations, and the foundational principles guiding governments and policies. The identification of contested public values in a democracy can be discerned through various sources, including constitutions, legislative mandates, policies, literature studies, and opinion surveys, presenting a relative consensus. Bozeman proposes that a joyous exploration of public value involves investigating the values held and advocated by a specific community. Describing his work as normative, Bozeman examines instances of "failure" where desirable forms of public value are not provided by society, market mechanisms, or government (Bryson et al., 2014; Mintrom & Luetjens, 2017).

In contrast to the work of Bozeman and the literature it inspired, Mark H. Moore's contribution to the public value discourse is action-driven (Mintrom & Luetjens, 2017). Moore's focus is on public managers, and he initially saw public value as the public management equivalent of shareholder value. He also expressed concern about the devaluation of government and public managers in the current age of economic individualism and market dominance. Moore seeks persuasive rhetoric and a methodology for identifying, advocating for, and achieving public value. While his early book's view of public value creation is more limited than subsequent literature, which acknowledges that government performance primarily determines public value (Bryson et al., 2014), Moore believes that the following three elements, combined, constitute "public value" and satisfy citizens' needs from their government:

- Public bureaucracies that are service-oriented and high-performing
- Public organizations that are efficient and effective in achieving social outcomes that satisfy citizens
- Public organizations that operate fairly and equitably contribute to a just and equitable society.

While Bozeman's definition of public value may be less precise than Moore's, it does outline some fundamental public values, including efficiency, effectiveness, socially and politically approved outcomes, procedural justice, and substantive justice. Like Bozeman's definition, Moore's idea of public value encompasses measures of input, process, output, and outcome (Bryson et al., 2014). Ultimately, public value refers to individuals' and groups perceived worth of ends, results, and outputs. Public value creation hinges on whether these parties perceive that the ends, results, and outputs have led to improvements that align with their individual or group values. The public value approach assumes that all stages of value development, aggregation, and conversion to outcomes have occurred. It evaluates the success of these stages in achieving their intended purpose. In this sense, public value and public values are intertwined: public value is the realization of the ideals set forth by public values, evaluated against the criteria established by public values (Witesman, 2016).

2.4.1. EHealth Public Value Background

The application of the public value concept extends to examining eHealth services, which are ICT-based government services that offer healthcare information and services to citizens (Gerli et al., 2021). Bend (2004) evaluated the public value of eHealth apps based on their capacity to attain desired outcomes and the level of confidence between citizens and healthcare professionals. In contrast, Svejvig et al. (2012) took a more comprehensive approach by exploring how eHealth affects the perceptions of patients and employees regarding the quality of healthcare services. Additionally, other scholars have proposed that the assessment of eHealth services should incorporate factors such as privacy, security, accountability, and public value considerations (Gerli et al., 2021).

Previous research has explored public value from various perspectives, as proposed and examined by Gerli et al. (2021). For example, Jørgensen & Bozeman, (2007) identified seven primary perspectives, including the relationship between public administration and citizens, focusing on the relationship between government and stakeholders regarding user orientation, participation, legality, and equity. Additionally, Meynhardt & Bartholomes, (2011) discovered a psychological gap in public value theory by broadening the meaning of value creation beyond financial or economic value. Creating value is not just about delivery; it also involves recognition and perception. Public value is seen as a resource for meeting fundamental needs and has three components, according to Meynhardt & Bartholomes (ibad):

1. Institutional Performance: This includes tasks related to service and delivery and is concerned with how efficiently an institution accomplishes its fundamental tasks. This is an essential aspect of performance perception.
2. Moral Obligation: This ethical stance is linked with labor agencies that recognize the diversity of people's circumstances and requirements. This element aims to compensate people with a disadvantage or handicap in the labor market and remove obstacles based on personal traits such as gender and race.
3. Political Stability: This consists of three themes, including social peace, social cohesion, and the avoidance of significant differences between groups. Factor 3 relates to beneficial ties between groups and a sense of belongingness from the standpoint of basic requirements.

In their 2019 study, Twizeyimana and Andersson explored how e-government can benefit the public, as perceived by users and stakeholders. They identified five key dimensions: Improved Public Services, Open Government Capabilities, Improved Ethical Behavior and Professionalism, Improved Social Value and Well-Being, and Improved Trust and Confidence in Government (Twizeyimana & Andersson, 2019). Meanwhile, Scott et al. (2016) delved into the public value-based construct, which assesses information system success in e-government from the public's perspective. They found that this construct includes nine factors that can shed light on the public's perceptions of e-government success: Cost, Time, Convenience, Personalization, Communication, Ease of Information Retrieval, Trust, Well-Informedness, and Participation in Decision-Making.

Meanwhile, Lopes et al. (2019) present a public value framework with two distinct dimensions. The first dimension involves the primary drivers of public value, encompassing four elements: citizen trust, e-service design, governmental readiness, and a collaborative process between the government and service users. E-service design and citizen trust are identified as "direct factors" in this dimension, serving as immediate sources of public value through e-service adoption. On the other hand, the collaborative process between the government and citizens, along with governmental readiness, is categorized as an "indirect factor," relying on the presence of other elements to deliver public value (refer to Figure 16).

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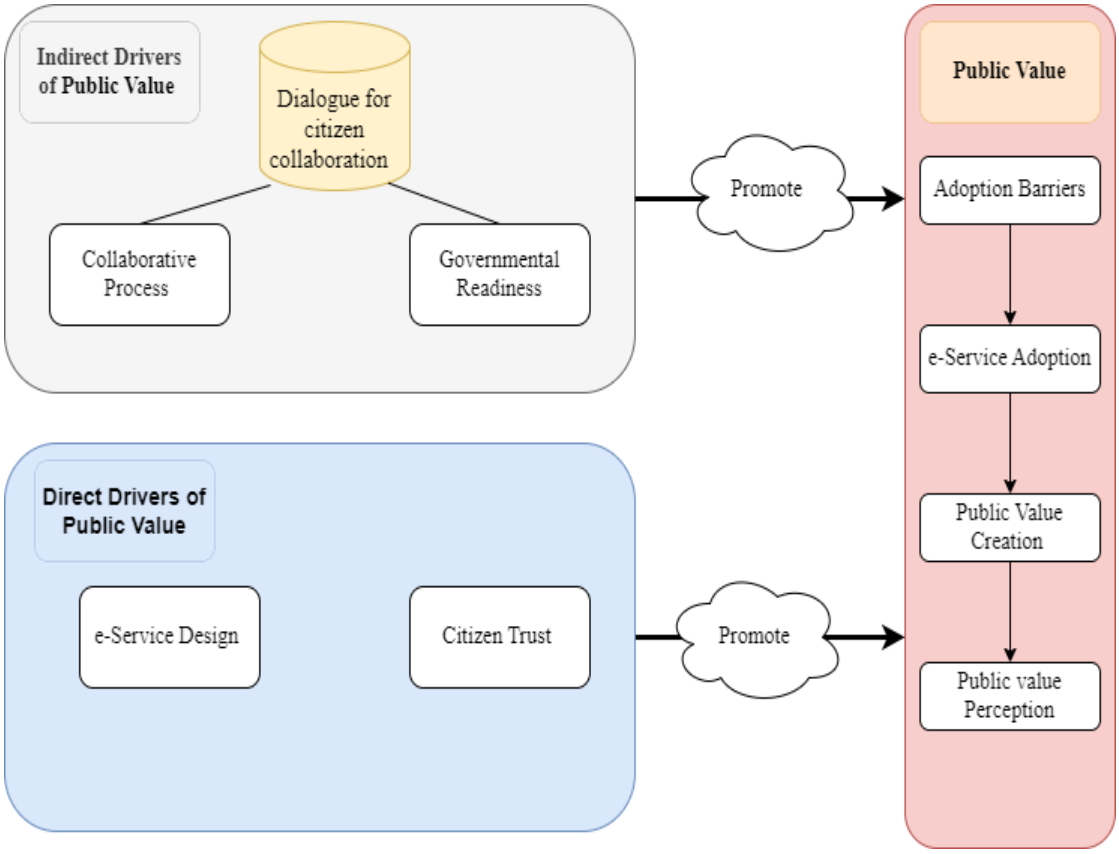

Figure 16. Public value by e-service.
Source: Own elaboration adapted from Lopes et al (2019).

Concerning developing nations, Karunasena & Deng (2012) have identified crucial variables for assessing the public value of e-government, mainly focusing on the delivery of public services and the effectiveness of public organizations.

The proposed framework assesses the quality of publicly accessible data based on citizens' evaluations of its utility. Accuracy, timeliness, relevancy, precision, and richness are crucial in determining the quality of information on government websites. To enhance public service delivery, citizens' assessments of comprehensive two-way transactions and real-time interactions, such as online payments and form submissions, are critical in gauging the public value of e-government. A citizen-centric approach is vital for efficient service provision, and factors such as satisfaction with government websites, the availability of a single platform for all inquiries, and the presence of a frequently asked questions database can help evaluate this approach. Conversely, the efficiency of public organizations is an essential determinant of public value, assessed through indicators such as cost reduction, transparency, responsiveness to citizens' inquiries through e-government channels, the ability to track application statuses, and the online display of citizens' charters. The comprehensive evaluation also considers environmental sustainability, which is achieved through energy conservation, data and resource sharing, and reduced paper usage (Karunasena et al., 2011; Karunasena & Deng, 2012).

Furthermore, in their recent study, Gerli et al. (2021) delved into the dimensions of public value in relation to eHealth adoption (see Figure 17). They reviewed three conceptual frameworks- Jørgensen & Bozeman, (2007), Twizeyimana & Andersson, (2019), and Scott et al., (2016)- and integrated values such as user orientation, participation, and legality equity with crucial dimensions like improved public services, administration, and social value. The authors used outcomes and indicators to measure e-government services, as identified by Twizeyimana & Andersson (2019) and Scott et al. (2016). The framework developed by Gerli et al. demonstrates how various indicators contribute to increasing public value through

improved public services, administration, or social value and wellness. Additionally, they categorized public value components into three categories: applications delivered via digital devices, personal data collection and use, and open-source principles. Their research emphasizes that public value theory provides a robust framework for studying e-services and highlights the intricate relationships between different components of public value in the context of healthcare delivery.

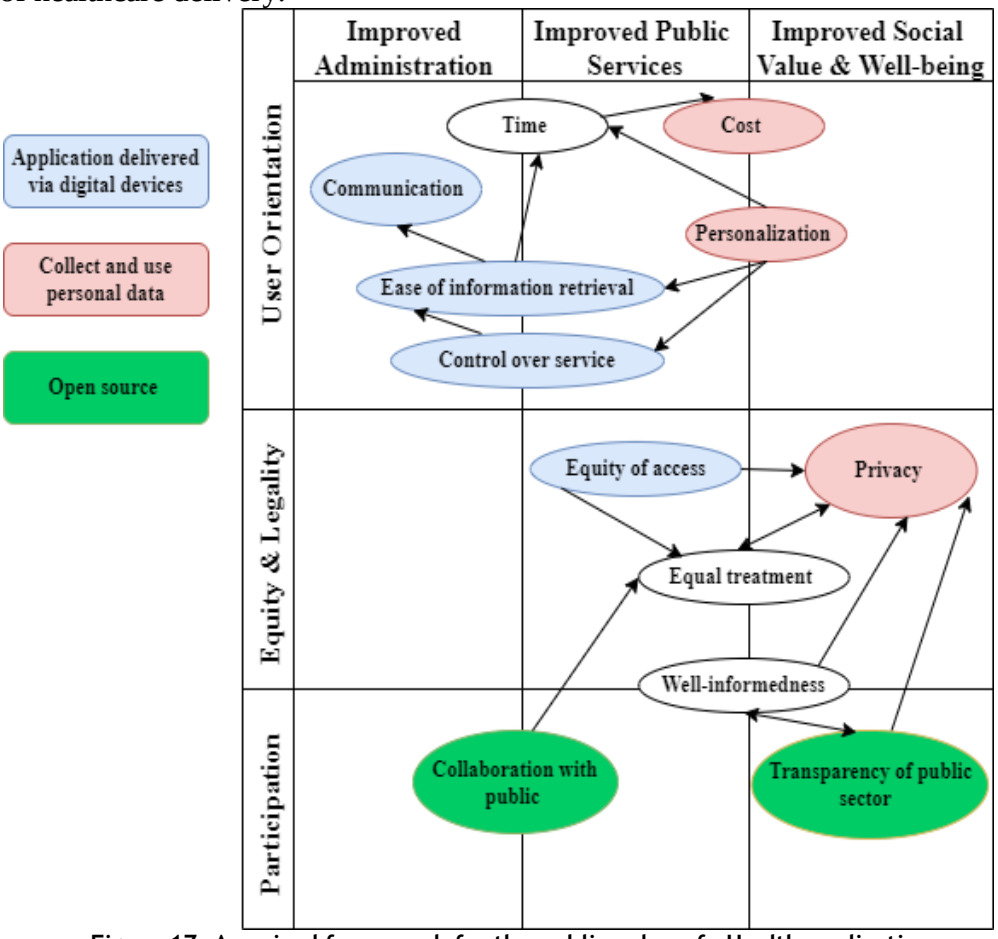

Figure 17. A revised framework for the public value of eHealth applications. Source: Own elaboration adapted from Gerli et al. (2021).

In keeping with this field of knowledge, Obie and colleagues (2021) conducted two initial Q-studies to explore the human value opinions that end-users hold regarding eHealth apps and the eHealth domain as a whole. To do this, they utilized the Portrait Values Questionnaire (PVQ) and Schwartz's basic needs theory to develop a survey that focused on ten values, including "power," "security," "self-direction," and "benevolence." Their results revealed three prominent value types in generic value instruments: fun-loving, success-driven, and independent; security-conscious, socially-concerned, and success-driven; and benevolent, success-driven, and conformist.

Furthermore, the study found two types of value opinions when using domain-specific value instruments in eHealth: security-conscious, reputable, and honest end-users and success-driven, reputable, and pain-avoiding end-users. Obie et al. (2021) also noted that users may have different perceived value hierarchies depending on the domain or experience. As users move across various domain contexts, they may encounter varying human value trade-offs, but this should not come at the expense of their values or those of society.

The researchers' preliminary findings emphasize the importance of creating domain-specific value instruments to elicit human values. This approach considers the specificity of

the domain in question instead of relying on generic instruments that may lack contextual significance and fail to probe human values in domain-specific contexts accurately.

2.5. EHEALTH TECHNOLOGY ACCEPTANCE MODELS

Extensive research in information systems (IS) and ICT has delved into technology acceptance, exploring various theories and models that can help predict and evaluate behavior in numerous domains. These include the Theories of Reasoned Action (TRA), the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM, TAM2), and the Unified Theory of Acceptance and Use of Technology (UTAUT and UTAUT2) (Narh & Williams, 2012).

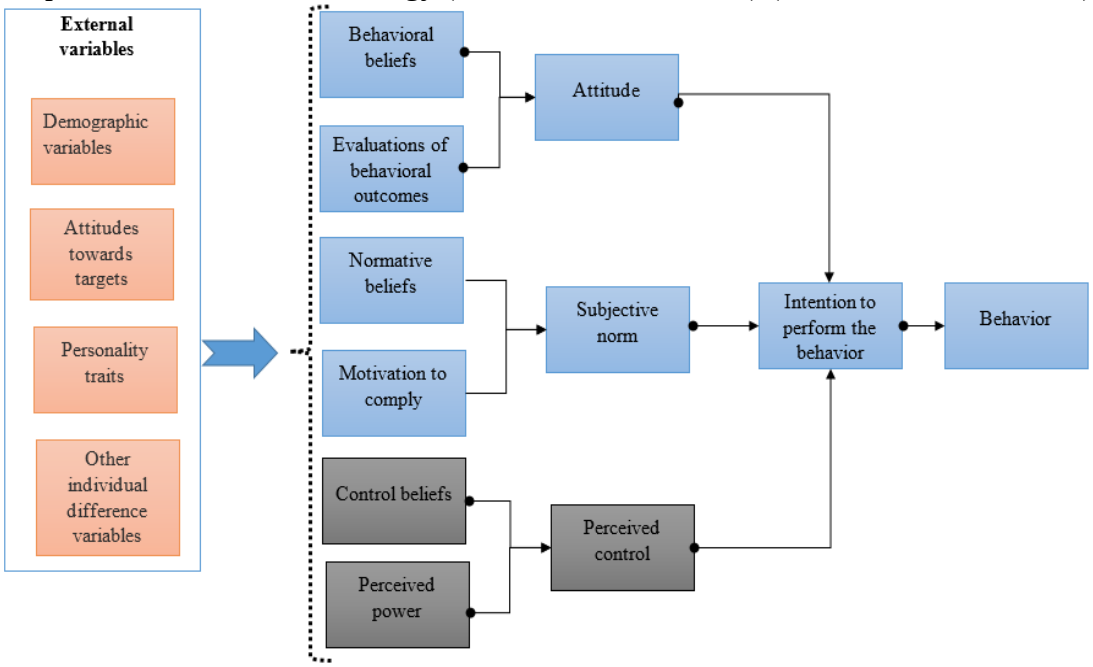

Figure 18. Theory of Reasoned Action in the blue boxes and the entire figure shows the Theory of Planned Behavior.
Source: Own elaboration adapted from Glanz et al. (2008).

Theories and models of technology acceptance have examined the behaviors of individuals and their capacity to accept and adopt new technologies based on certain variables and concepts. From a psychological and behavioral standpoint, these theories have examined how users utilize technology (Momani, 2020). However, the theory of reasoned action (TRA) by Fishbein and Ajzen is the overarching theory from which most consumer acceptance of IS theories are founded. Originating in the field of psychology, TRA has served as the foundation for numerous user acceptance theories (Park, 2020).

The Theory of Reasoned Action (TRA) posits that a person's intention to engage in a behavior determines their actions, which is influenced by their attitude towards the behavior and subjective norms. Intent or instrumentality is the most reliable predictor of behavior, which is determined by attitude, subjective norms, and perception of behavioral control (refer to Figure 18). The stronger the person's motivation to carry out the behavior, the more favorable their attitude and subjective norms, and the greater their perceived control (Silverman et al., 2016).

However, TRA has limitations, including the risk of confusing attitudes and norms and the assumption that a person's intention to act equates to their ability. Factors such as skill, time, environmental or organizational constraints, and unconscious biases may limit their freedom to act. Thus, additional explanatory variables are necessary for TRA (Samaradiwakara & Chandra, 2014).

The Theory of Planned Behavior (TPB) was developed to address these limitations. While TRA asserts that behavioral intention is the most significant driver of action (as seen in the blue boxes in Figure 18), TPB adds that attitude towards completing the behavior and the subjective norm associated with the behavior directly determine an individual's behavioral intention. TPB also includes perceived control over the behavior, accounting for scenarios where an individual may not have complete volitional control over behavior (Glanz et al., 2008).

Both models assume that individuals make logical, reasoned decisions to engage in specific behaviors by analyzing the information available to them. The performance of a behavior is determined by the individual's intention to participate in it, which is influenced by the value the individual places on the behavior, the ease with which it can be performed, and the opinions of significant others. Additionally, the individual's perception that the behavior is under their control is also a significant factor. In rheumatoid arthritis (RA), a TPB model based on attitudes, social support, self-efficacy, and intention has effectively predicted and explained arthritis self-management. Although no validated questionnaires are available, Ajzen provides a comprehensive guide for developing measures of TPB components. However, attitudes are hard to conceptualize and capture, making it challenging to measure TPB (S. Ryan & Carr, 2010).

Furthermore, social norm measures have an inferior psychometric perspective. They may have little impact on behavioral intention, mainly when individual usage is voluntary and somewhat personal for information system (IS) applications. As a result, Davis (1986, 1989) proposed the Technology Acceptance Model (TAM) to theorize the usage behavior of information technology (Rauniar et al., 2014). TAM attempts to explain why individuals adopt or do not adopt a particular technology when performing a task. Several researchers have expanded and adapted TAM and applied it to many different technologies, including spreadsheets, voice (Wallace & Sheetz, 2014) and eHealth (Rahimi et al., 2018).

As shown in Figure 19, there are two drivers of TAM: perceived usefulness and ease of use, which were predicted to be critical determinants of user adoption of information technology in the technology acceptance model (TAM). Perceived usefulness is defined as the extent to which a person believes that employing a specific system would improve his or her job performance. On the other hand, perceived ease of use refers to the degree to which a person perceives that utilizing a specific system would be effortless (Fanta et al., 2016). The TAM model assumes that a technology's perceived usefulness and perceived ease of use will confirm an individual's intention to utilize it (Habibian Naeini & BalaKrishnam, 2012). The reasoning behind the concept of perceived ease of use lies in the idea that individuals, even if they recognize the potential usefulness of technology, may only choose to adopt it if they perceive that utilizing it would involve minimal effort.

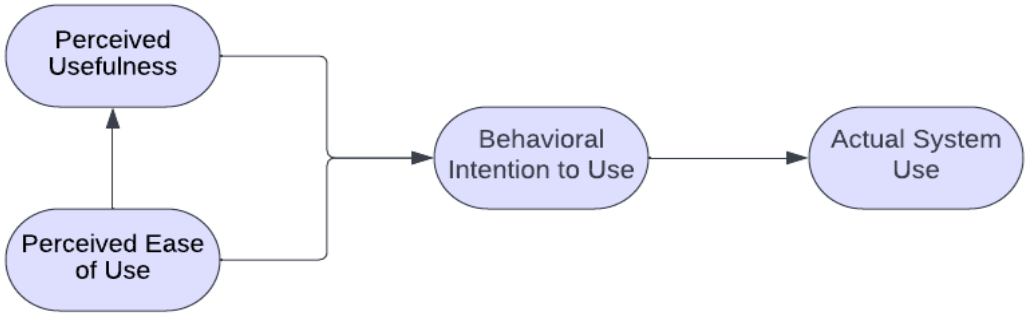

Figure 19. Technology Acceptance Model.
Source: Own elaboration adapted from Fanta et al. (2016).

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While Pierre Bourdieu's theory proposes that social agents operate based on implicit practical logic and bodily disposition rather than rational intention, the idea that a stronger

intention to engage in behavior results in a higher likelihood of performing that behavior holds when it comes to using technology. It is not possible to use technology automatically or without intention, making the argument quite convincing (M. Park, 2020). TRA and TAM assume that when someone develops a goal to achieve, they will be unrestricted in their ability to do so. While various factors may impede one's ability to take action, such as skill limitations, time constraints, environmental or organizational constraints, and unconscious habits, this model proposes that users' decisions on when and how to use a new software package are influenced by their perceived usefulness and perceived ease of use. Using the TAM, other investigations of IT usage have been conducted (Habibian Naeini & BalaKrishnam, 2012). Nonetheless, particular academics (Sánchez-Prieto et al., 2016; Liu & Yang, 2018) have posited that TAM has its limitations, such as (1) failing to provide a sufficient understanding of users' viewpoints on the novel system and (2) disregarding its indicators and solely examining the external factors of perceived ease of use (PEOU) and perceived benefit (PU).

For this reason, The TAM model developed by Venkatesh and Davis served as the basis for TAM2, which expands upon the original model by including additional determinants that explain perceived usefulness and usage intentions. TAM2 also seeks to understand how these determinants change over time as users gain more experience with the technology. Venkatesh and Davis found that subjective norm, voluntariness, image, job relevance, output quality, outcome demonstrability, and perceived ease of use all strongly influence user acceptance (Samaradiwakara & Chandra, 2014).

However, in TAM2, it is unclear how expectations are playing a role in shaping the behavior. In addition, it is unable to foresee the user's culturally-specific behavior(Momani, 2020). Due to the limitations of the TAM and TAM2 models, Venkatesh et al. (2003) combined components from eight theories, including TRA, IDT, TPB, TAM, TAM-TPB, MM, MPCU, and SCT, to create the UTAUT model. This unified model was designed to predict and explain the adoption, acceptance, and usage of new technology. To fully comprehend the development process leading up to the UTAUT, a timeline outlining the evolution of each theory (as well as others) has been provided in Figure 20.

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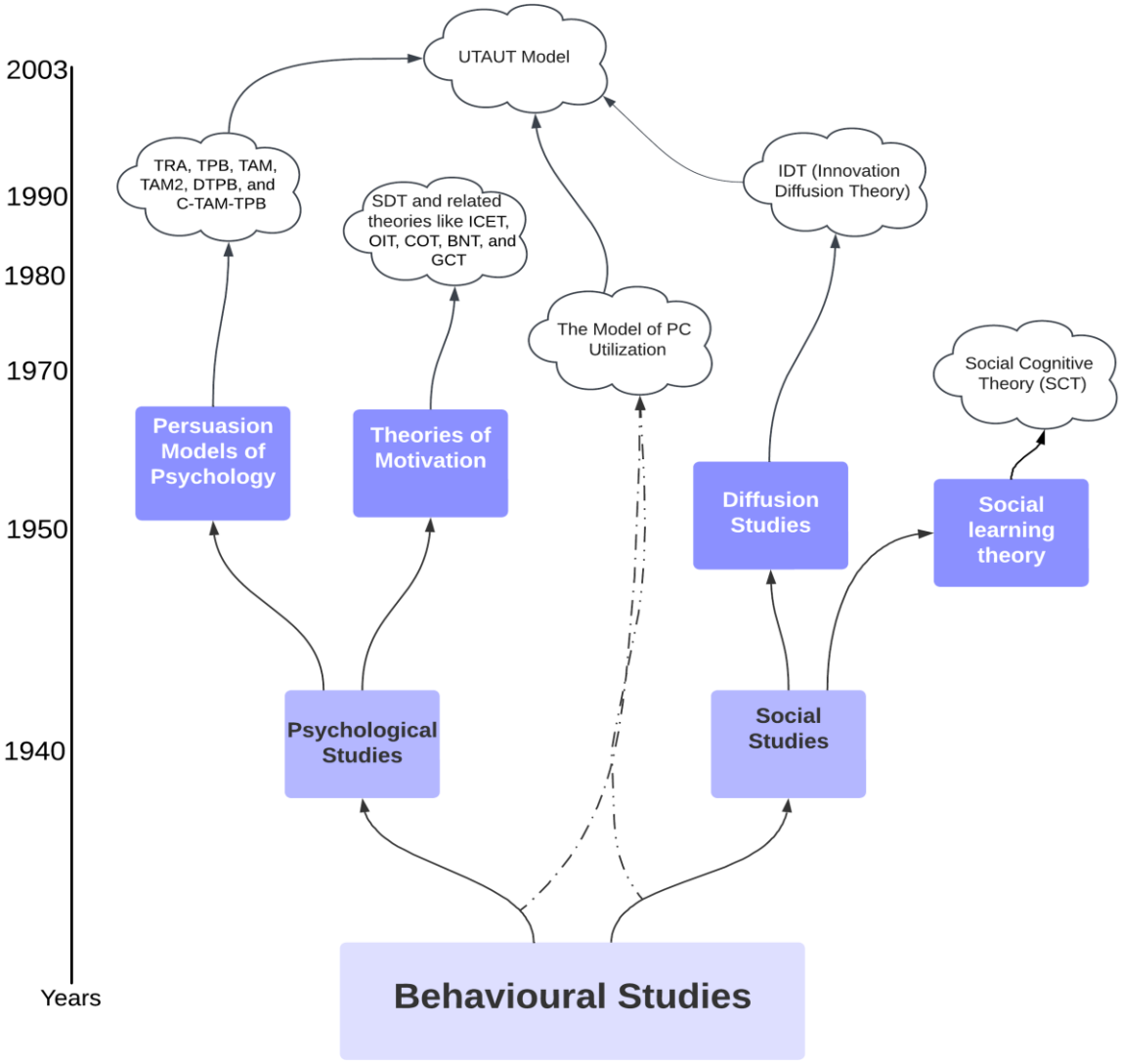

Figure 20. Chronological graph for the evolution of technology acceptance theories. Source: Own elaboration adapted from Momani and Jamous (2017).

This graph illustrates the evolution of technology acceptance theories over time, organized into four primary paths based on the behavioral field. These theories stem from decades of research into human behavior, initially categorized as psychological and sociological studies. They aim to understand how individuals accept and adopt new technologies by examining specific constructs and variables. While each theory emphasizes technology users' psychological and behavioral perspectives, they all have their own constraints and conceptual frameworks. For instance, the TPB and TAM theories are derived from the TRA. Despite their differences, these theories share fundamental concerns, as Qingfei, Shaobo, and Gang pointed out. Firstly, they employ different terminology, but their constructions are essentially identical. Secondly, no single theory can account for all behavioral elements due to the complexity of behavior study and the constraints of researchers (Momani, 2020; Momani & Jamous, 2017).

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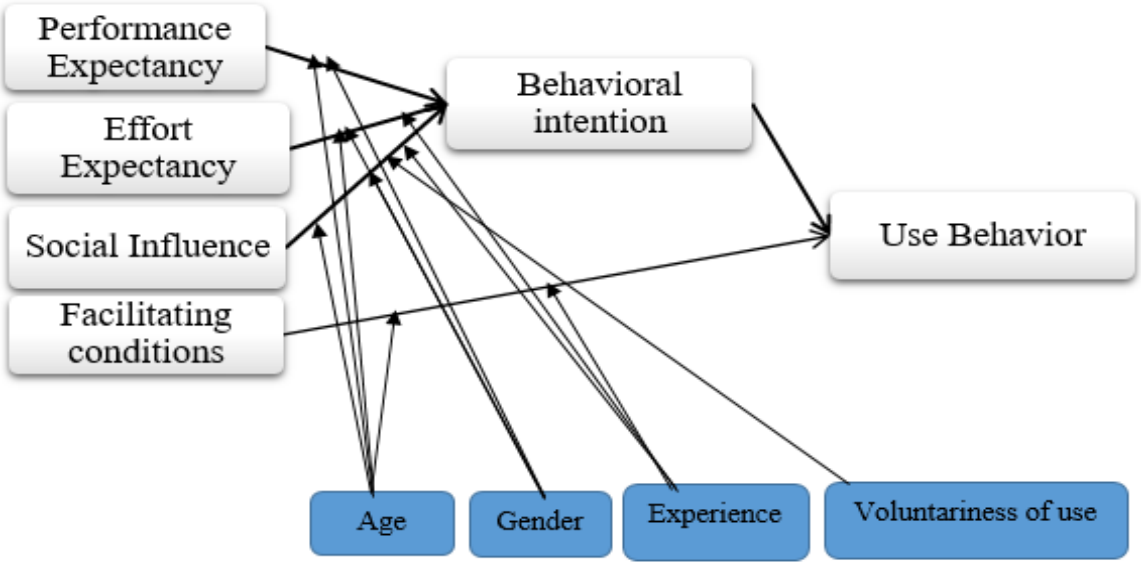

Figure 21. UTAUT model.
Source: Own elaboration adapted from Samaradiwakara and Chandra (2014).

In this regard, Venkatesh et al. (2003) developed a comprehensive model that identifies four primary determinants of intention and usage, as well as four moderators of crucial interactions. The model proposes that user adoption and technology usage behavior are determined by four constructs: performance expectancy, expectations for effort, social influence, and facilitating conditions, as illustrated in Figure 21. However, it is essential to note that attitude toward technology use, self-efficacy, and anxiety do not directly predict intention. The primary moderators in the model are gender, age, voluntariness, and experience. The UTAUT model offers a refined understanding of how the determinants of intention and behavior change over time, and most of the model's fundamental interactions are regulated (Samaradiwakara & Chandra, 2014).

According to Samaradiwakara & Chandra (2014) literature review, the UTAUT model stands out as a practical framework for explaining technological adoption behavior, boasting several noteworthy features. The UTAUT model's strength lies in its superior explanatory capacity, the identification and addressing of eight specific constructs to form determinants of behavioral intention and technology usage behavior, as well as its robust validation through longitudinal data from diverse sectors (Entertainment, Telecom Services, Banking, and Public Administration). By comparing eight constructs and utilizing conceptual and empirical considerations, the UTAUT model's conceptual framework was formulated and empirically tested using original data from the mentioned organizations and cross-validated with new data. This comprehensive approach positions the UTAUT model as a reliable foundation for understanding the factors influencing users' acceptance or rejection of technology.

While the UTAUT model provides a solid basis for explaining technology acceptance, it was primarily developed to examine adoption in a corporate setting. Recognizing this limitation, Venkatesh et al. introduced the UTAUT2, specifically tailored to a consumer context. UTAUT2 diverges from its predecessor by introducing three key determinants and eliminating the voluntariness moderator—the focus of UTAUT2 shifts to understanding consumer adoption of Information Systems (IS). Omitting voluntariness is justified in a consumer environment, where individuals make choices without organizational mandates. The UTAUT2 model, designed to view determinants from the consumer's perspective, introduces three new determinants: hedonic motivation, price value, and habit (M. Park, 2020).

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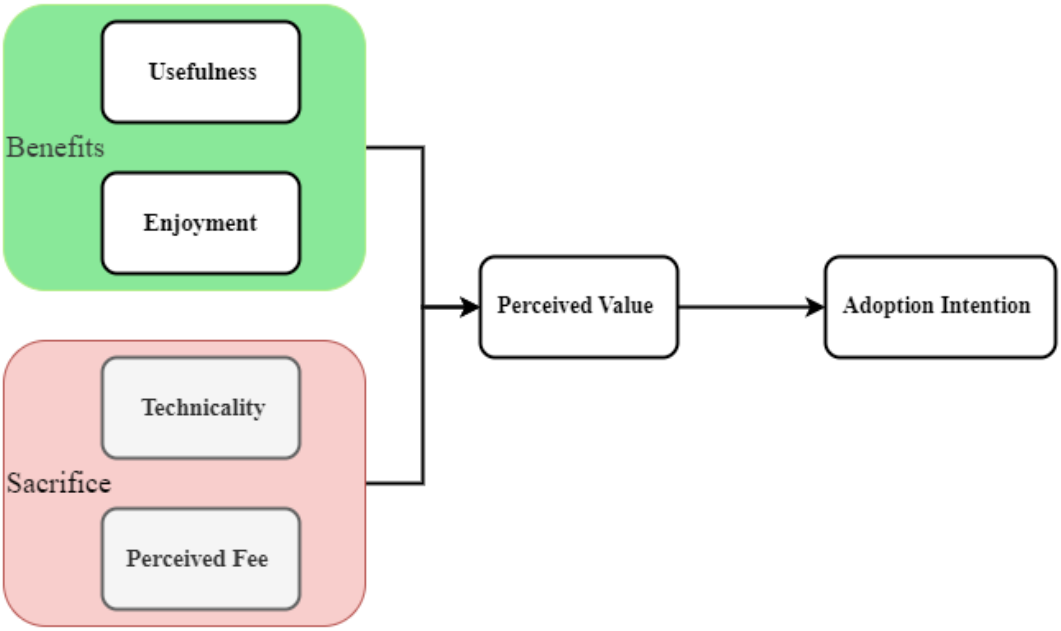

Figure 22. Value-Based Adoption Model of technology.
Source: Own elaboration adapted from Kim et al. (2007).

Aligned with this perspective, Kim et al. proposed a Value-Based Adoption Model (VAM) for M-Internet that integrates insights from technology adoption and value literature. This model emphasizes maximizing user-perceived value from the user's perspective and draws on the Technology Acceptance Model (TAM) and perceived value theory. While TAM focuses on understanding the relationship between individuals' beliefs, attitudes, intentions, and behavior within organizational contexts, the VAM emphasizes consumer preferences in the context of voluntary consumption. As mobile internet and m-commerce have evolved, consumers have become more discerning in their product choices and prioritize whether a product can meet their value requirements (Kim et al., 2007). Kim proposed utilizing a VAM to examine how mobile internet users currently use and intend to utilize the internet(Ye et al., 2022). Kim and coworkers demonstrate that VAM can be utilized to comprehend the adoption decision of new ICT based on net value. In particular, adoption intention is defined by the appraised value, which involves a comprehensive evaluation of benefits and sacrifices (see figure 22) (Lin et al., 2012). This is primarily due to the fact that VAM, in contrast to TAM, places greater emphasis on the importance of "usefulness" and "enjoyment" as the benefits, and "technicality" and "perceived fee" as sacrifice, as the primary factors of perceived value leading to the users' intention to use a particular IT (Trapero et al., 2019).

Nevertheless, Ashraf et al. (2021) argued that previous research has primarily focused on the unidimensional perceived value of technology, with limited examination of other value dimensions in a single-country context. However, a more comprehensive and nuanced understanding of what constitutes a positive technological experience at the country level is necessary, as individuals in different countries may perceive value differently based on previous research in information systems (IS). Moreover, the IS literature suggesting that technology adoption and acceptance are fundamentally intentional behaviors. Nonetheless, recent conceptual advancements in the IS and marketing literature on information technology (IT) use have proposed that it may also be habitual. As human behavior results from conscious (intentional) and unconscious (habitual) decisions, research that only considers one route provides a limited explanation of the phenomenon.

Consequently, many researchers have created models to understand how people adopt and accept new services. One such model was developed by Kim et al. (2017), which looked at how variables related to perceived sacrifice and perceived benefit influenced perceived value

and, in turn, attitude and intention to use. The study found that people tend to think in dual processes and that both perceived sacrifice and perceived benefit played a role in determining perceived value. However, perceived benefit was found to be more important than perceived sacrifice. Ultimately, the study showed that perceived value had a significant impact on whether or not people were willing to use a new service. Essentially, potential clients will only accept a new type of service if the benefits outweigh the costs.

Also, Fanta et al. (2016) proposed the sociotechnical framework for eHealth acceptability using the TAM and IS success models as well as sociotechnical models. The theoretical framework is separated into four main dimensions: technological, social, technology use, and outcome. As described in the IS success model, the technological part of the framework consists of system, information, and service qualities. The social dimension of the sociotechnical model for technology adoption is derived from the TAM using the users' perceptions of usefulness and ease of use, as well as social influence. Under the technology use component of the theoretical framework, the elements of intention to use, actual usage, and user satisfaction described in both the TAM and IS success models are grouped. Lastly, the framework's outcome dimension adapted the net benefit from the IS success model.

Furthermore, Literature that provides empirical evidence validating the relationship between the elements of the TAM and IS success models is used to determine the relationship between the sociotechnical framework for technology acceptance's components. The dynamic nature and sociotechnical features of eHealth implementations are investigated using a system dynamics approach. Although the use of the well-researched TAM and IS models, as well as the evaluation of the literature and empirical evidence to determine the link between the aspects of the proposed theoretical model, is the strength of this work, it is not without limits. Not every study that empirically validated the TAM and IS success models is covered by the literature reviews. In addition, the theoretical framework has not yet been supported by empirical evidence.

Moreover, Junker et al. (2022) conducted a study to evaluate the accuracy of Melzner's model, which is based on the TAM, TPB, and Health Belief Model (HBM). Melzner et al. (2014) argued that the connection between perceived severity, perceived susceptibility, and perceived usefulness as a driver for action is a novel idea in the literature on health behavior and health technology acceptance. He also emphasized that application developers must have a deeper understanding of the crucial factors governing mobile health application acceptance.

Figure 23 highlights the significance of antecedents such as perceived usefulness, ease of use, enjoyment, and cues to action in designing a health app's user interface and features. Melzner's research inspires managers to incorporate these concepts into their health programs. They can launch an awareness campaign (external influence) and motivate managers to participate actively, laying the groundwork for word-of-mouth transmission (interpersonal influence). Additionally, they must provide the necessary resources to facilitate adoption.

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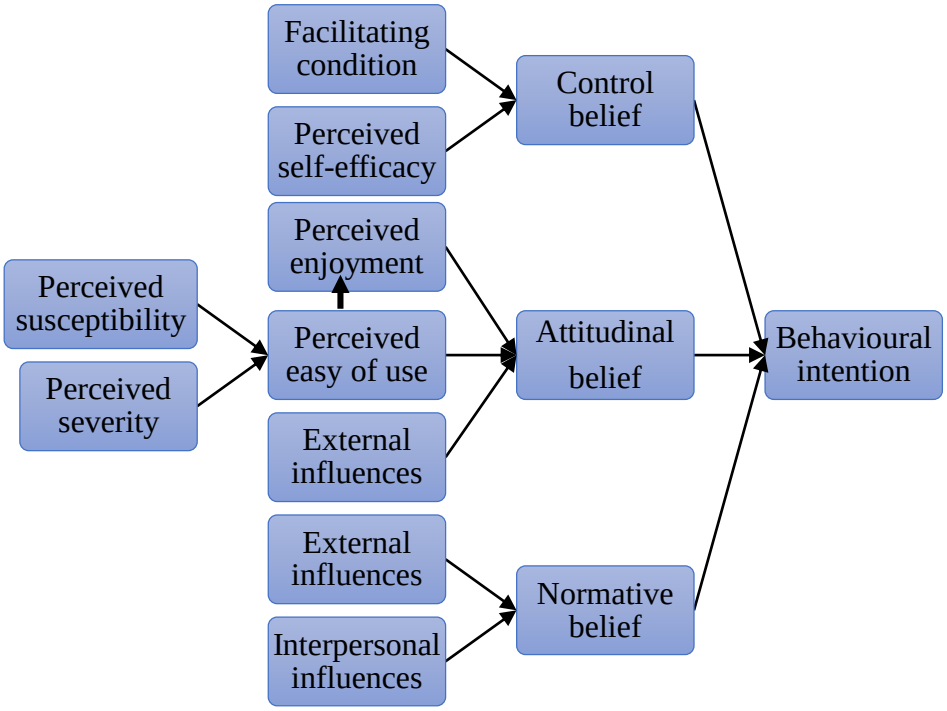

Figure 23. Melzner's model for the adoption and use of mobile health.
Source: Own elaboration adapted from Melzner et al. (2014).

Moreover, according to the research of Junker et al. (2022), control beliefs and facilitating conditions are less important in the current context, but that emphasis should be paid to perceived usefulness, ease of use, and especially normative belief, which was found to be the most significant difference between contexts. In order to meet the specific requirements of each user, it is essential to incorporate employee input during the app's development. Additionally, managerial support is necessary and should be encouraged. Moreover, the study revealed that a company's communication strategy is crucial for adapting to the needs of its employees and so convincing them to engage.

In the Electronic Health Records (EHR) context, Tavares & Oliveira (2017) conducted a study to explore the factors influencing individuals' adoption of EHR portals, mainly focusing on healthcare consumers. Their investigation aimed to discern potential differences between countries with distinct healthcare models, namely the United States and Portugal. Utilizing the Concern for Information Privacy (CFIP) framework, they extended the Unified Theory of Acceptance and Use of Technology (UTAUT2). The research identified thateffort expectation, social influence, hedonic motivation (as a negative influence), price value, and habit significantly impacted behavioral intention. Habit and behavioral intention, in turn, substantially affected usage behavior. Notably, the American group exhibited a statistically significant impact of price value on behavioral intention, in contrast to the Portuguese group. This disparity suggests that the perceived value of EHR portals is more pronounced in a country like the United States, where healthcare costs are notably high for patients.

Furthermore, Venkatesh et al. (2011) presented a revised version of the UTAUT model for the adoption and utilization of EHR systems by hospital physicians. The revised model indicated a decrease in the explained variance of behavioral intention from 76% in the original model to 44% in the revised model (with only age as a moderator variable) in the healthcare context. Nevertheless, this is still a promising sign for implementing UTAUT2-like approaches that focus on healthcare consumers (Tavares & Oliveira, 2017). Additionally, the revised model revealed that three out of the four core constructs played a crucial role in EHR adoption by healthcare professionals, namely, performance expectancy, effort expectancy, and social

influence. Notably, performance expectancy was found to be the most significant factor, indicating that healthcare workers expect EHR systems to enhance their productivity at work (Tavares & Oliveira, 2017; Venkatesh, Sykes, et al., 2011).

Moreover, the UTAUT model was successfully adapted to measure acceptance towards internet- and mobile-based interventions (IMIs). The general structure of the model, with the three main predictors of acceptance—performance expectancy, effort expectancy, and social influence—was confirmed, and internet anxiety was added as a direct predictor and moderator of the effects of social influence and effort expectancy on acceptance. Furthermore, providing users with appropriate assistance and information and encouraging them to trust technology could help alleviate internet anxiety (Philippi et al., 2021).

In fact, while examining eHealth adoption, the Unified Theory of Acceptance and Use of Technology (UTAUT) was the most frequently utilized model(Heinsch et al., 2021; Tavares & Oliveira, 2017), particularly in developing countries (Semwanga et al., 2021). In this context, Arfi et al. (2021) provide a summary of studies that employed the UTAUT theoretical frameworks to evaluate technology adoption in healthcare and the eHealth context. His summary shows that, excluding the variables of the original UTAUT (PE, EE, SI, and FC), researchers investigated a variety of other variables influencing behavioral intention in healthcare. All of these aspects can be subdivided conditionally into those relating to users' (1) personal characteristics, (2) technological knowledge, and (3) data disclosure. Some variables, such as digital literacy, take into account the user's level of expertise or prior experiences with technology. In contrast, characteristics associated with the user's personality rather than the technology itself can explain the adoption of an information system. Self-efficacy, or computer self-efficacy, is a crucial and often-discussed factor. However, a high FC can provide the support necessary for technology acceptance. Other researchers studied the relationship between personal innovativeness and behavioral intention, whereas psychological factors were investigated as predictors of BI. In addition, challenges emerging from the use of digital technology in health care that demand the collecting of personal data, such as perceived security, privacy threats, and information security, were investigated (Arfi et al., 2021).

Despite their widespread use, critics contend that TAM and UTAUT are overly simplistic and narrow in scope, as they prioritize the perceptions, and general usage intentions of individual adopters. Furthermore, their impact on advancing knowledge has stagnated due to the abundance of studies employing these theories. Further, a weakness of adoption models such as TAM and UTAUT is that they assume a one-to-one relationship between users and their health information technology (HIT) needs. In contrast, healthcare delivery is provided by a variety of users and tasks, and the design of HIT must account for this diversity. Consequently, acceptance models did not reconcile the needs and perceptions of multiple users (Shachak et al., 2019).

On the basis of the flaws found in the models of technology adoption (particularly eHealth) that have been discussed previously, Syamsudin et al., (2018) note that the UTAUT model extension can be applied in non-commercial settings, such as public eHealth and online public service.

From this point, public service is used to create public value. According to Bend (2004), Public value can be seen as being created in one of three areas: The cost-effective provision of high-quality services, the achievement of desirable outcomes, or high levels of trust between citizens and government. Additionally, public value can be used to assist in decision-making and performance evaluation, and, about ICTs, to provide a bridge between the technology and health policy communities. The concept of public value is a standard means of assessing the effectiveness and efficiency of public services; it provides a comprehensive framework for examining public administration performance in creating public value for citizens (Karunasena et al., 2011). The development and improvement of public services in the health sector,

specifically eHealth, will certainly provide positive public perceptions. In addition, a government administration that carefully implements eHealth will surely produce supportive public value and provide input to agencies in developing a quality public service that supports the needs of society towards a more modern era (Wardani & Suryani, 2018).

2.6. EHEALTH ADOPTION (JORDAN CONTEXT)

Jordan, formally the Hashemite Kingdom of Jordan, is a developing country with an estimated population of 11,057,000 (Department of Statistics, 2021). According to the World Bank, Jordan is the leading provider of healthcare services in the Middle East and a main destination for medical tourism in the Middle East and North Africa (Asab et al., 2019). The health sector in Jordan comprises various entities, including the public, private, international, and charitable sectors, as well as councils and institutions dedicated to shaping health policy (refer to Figure 24). Within the public sector, notable organizations include the Ministry of Health (MOH), the Royal Medical Services (RMS), university hospitals (such as the University of Jordan Hospital and King Abdullah University Hospital), the Center for Diabetes, Endocrinology, and Genetics, and the National Center for Women's Health (High Health Council, 2016). Specifically, the Ministry of Health runs 27 hospitals and 1,245 primary care clinics. whereas the Royal Medical Service runs 11 hospitals(Asab et al., 2019).

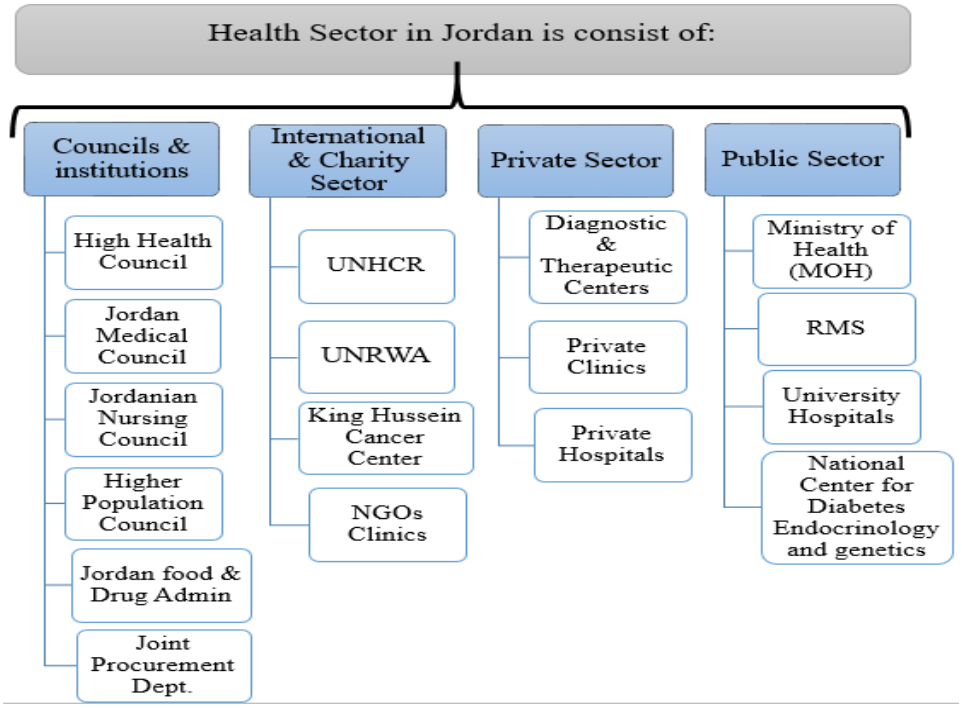

Figure 24. Major components of health sector in Jordan.
Source: Own elaboration adapted from High Health Council (2016).

Regarding the Middle East region, various eHealth initiatives have been incorporated in some of its countries, including Jordan(Alanezi, 2021). Whereas electronic patient portals (EPP, a type of eHealth technology) have been successfully implemented in the daily practice of some developed nations, less than 12% of healthcare institutions in the Arab world offer this service. The first one was released in 2015 in the United Arab Emirates. In the Middle East area as a whole, studies on user adoption of EPP are likewise scarce(Honein-AbouHaidar et al., 2020). The notion of eHealth is still relatively new in the Arab world, and applications of this technology are still limited. Jordan is not immune to this problem, as attempts to introduce limited-reach eHealth projects date back to 2008 (Murshidi et al., 2022). In Jordan, the well-established national eHealth initiative, Hakeem (https://ehs.com.jo/hakeem-program), consists

of two sides: the health care providers' side and the patients' side. We are currently concerned with the patient's perspective in our research. The Hakeem program for patients comprises two primary platforms. The first is the Hakeem Electronic Services (E-Med), which was created to facilitate patients who are already receiving medical care from any of the automated health facilities under the Jordanian Royal Medical Services or the Ministry of Health to access the services they require electronically, without the need to visit the health facilities in person (refer to Figure 25) (Electronic Health Solutions, 2022).

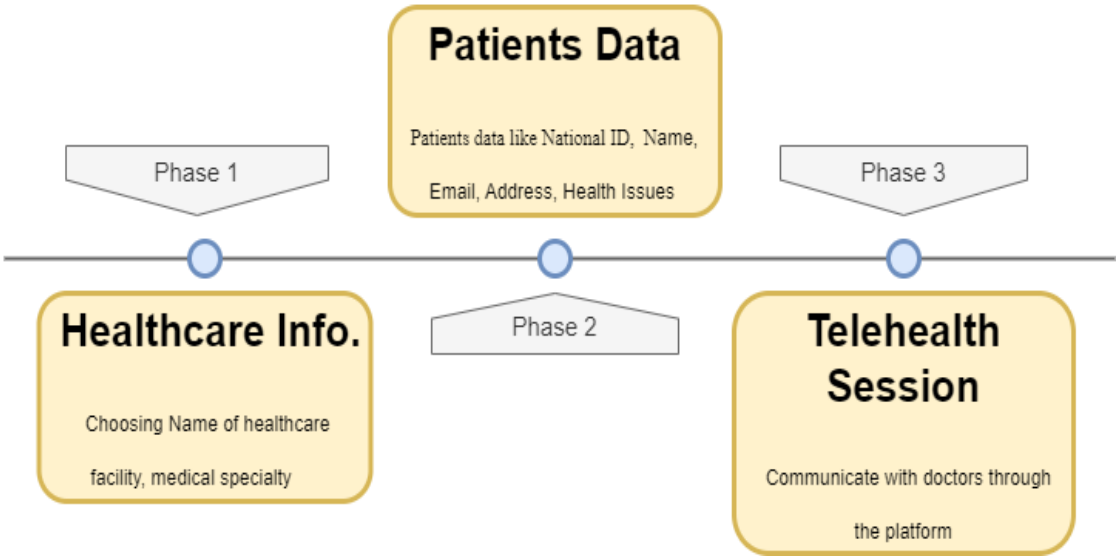

Figure 25. Chart for remote Follow-up Clinic (eMed).
Source: Own elaboration adapted from Electronic Health Solutions (2022).

The e-Med platform is composed of three main electronic services, namely medication refills, follow-up appointments, and telemedicine. The second service, MyHakeem Mobile Application, is a web-based platform and mobile app that allows users to conveniently access and view their pre-booked medical appointments, as well as important medical information such as active and pending medications, recent immunizations, pending and complete laboratory tests, allergies, vital signs, and demographic data. These data are securely stored on the user's electronic health record, which is registered within the healthcare institution that implements the Hakeem program. Furthermore, this application also provides a hassle-free way for patients to have their monthly medications delivered to them, especially if they are unable to physically go to the hospital (Electronic Health Solutions, 2022).

Nearly a decade has passed since Jordan began using the Hakeem healthcare program as part of its electronic society implementation, and over five million patients' records have been converted to digital form and stored there (Bani-Salameh et al., 2021; Karim et al., 2021). Furthermore, Jordanians have positive impressions of telemedicine. However, widespread implementation of eHealth at the national level is far from complete. because people in Jordan are worried about their privacy, getting a correct diagnosis, and dealing with medical error (Murshidi et al., 2022).

2.7. Literature Gap

Theories such as the technology acceptance model (TAM) proposed by Davis et al., the theory of reasoned action (TRA) proposed by Ajzen and Fishbein, the theory of planned behavior (TPB), and the diffusion of innovation theory all have been used to evaluate how well prospective customers accept various technology-driven platforms(A. Dash & Sahoo, 2022).

In contrast, Venkatesh et al. (2003) combined crucial components from eight different models and notable theories to forecast and clarify the adoption, acceptance, and utilization of

novel technology. Their proposed unified theory, known as the unified theory of acceptance and use of technology (UTAUT) model, has gained extensive usage and assessment in various fields (Chao, 2019), including adopting eHealth applications (D. Gu et al., 2021).

However, UTAUT has faced criticism for being overly simplistic and only focusing on individual adopters' perceptions, and general intentions. Despite being widely used in thousands of studies, these theories have plateaued in their contributions to the body of knowledge (Shachak et al., 2019). Bagozzi (2007) also criticized technological acceptance theories, like UTAUT, for causing chaos and information fragmentation with little cohesion. One example of this is UTAUT, which was recently proposed. While UTAUT has good intentions and presents a profound explanation, its model includes 41 separate factors to predict intentions and at least eight independent variables to forecast behavior (I say "at least" because there could be direct effects that Venkatesh et al. did not test).

In the context of eHealth, the UTAUT model has been extensively developed and applied in the developing world to evaluate patients' prospective adoption of technology (Addotey-Delove et al., 2022)). This model posits that people will adopt a technology on the basis of only four predictor criteria (Venkatesh, Thong, et al., 2011). However, more variables have been incorporated into variants of the models. In fact, it was recognized that the majority of studies used this model in conjunction with other theories and that it could not be used "alone" (Addotey-Delove et al., 2022). However, the UTAUT outperformed other acceptance models using the same data, accounting for around 70% of the variance in behavioral intention and 50% of the variance in technological use (Alam et al., 2018). Nevertheless, UTAUT does not currently cover additional factors that affect the acceptance of a technology in healthcare (Addotey-Delove et al., 2022)

A technology acceptance studies always assesses societal influence within the subjective norm and its influence on human technology adoption and use. However, two problems appear. First, the subjective standard might not be sufficient to address the complicated and extensive social factors that influence people's behavioral decisions about their health. second: Is the subjective norm a sound presumption? When a health system or healthcare institution unilaterally implements an eHealth intervention, patients may not have any "options." Therefore, a requirement for the accurate knowledge of the whole range of elements that may affect adoption among potential users under the current conditions depends on the effective adoption of a new technology in healthcare. Shachak and colleagues recommend that future research on the implementation and use of health information technology move away from the current theories of TAM and UTAUT in favor of a multifaceted approach that addresses the sophistication of factors affecting technology implementation and use in healthcare (Addotey-Delove et al., 2022; Shachak et al., 2019).

In addition, earlier research, notably those on mobile technologies like mHealth, have focused on the impact of total value on outcomes including intention, engagement, technology uptake, and usage.

However, considering perceived value as a single-dimensional concept may seem simplistic; it fails to capture the complex interplay between various value dimensions and consumer behavior. Research by Sweeney and Soutar has demonstrated that a multidimensional value construct, encompassing emotional, social, technical, and value-for-money factors, provides a more comprehensive understanding of consumer behavior (Ashraf et al., 2021).

On the other hand, researchers believe that citizens are the primary stakeholders who determine public value while simultaneously getting e-services. We recognize that citizen viewpoint is, by its very nature, an important factor that should be incorporated in the public value idea. In addition, it appears that smart technologies play a unique role in the interaction

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between government and citizens by establishing the setting for the development of public value and facilitating the co-creation of public services.

In the post-NPM era, however, there is a dearth of research analyzing the major drivers of public value generation(Lopes et al., 2019). especially, in the context of developing countries (Twizeyimana & Andersson, 2019). Also, Gerli et al. (2021) suggested that public value provides a strong framework for analyzing e-government services such as eHealth; yet, the relationships between the many dimensions of public value in the context of healthcare delivery are complex. This element requires additional empirical and theoretical investigation to establish how eHealth apps might help the public without compromising the rights and benefits of individual users and marginalized groups.

2.8. THESIS MODEL AND HYPOTHESIS GENERATION

Researchers have employed a variety of theoretical frameworks to explore how users adopt technology. These include the innovation diffusion theory, the technology acceptance model, the theory of reasoned action, the social cognitive theory, the technology life cycle, the personal computing utilization model, and UTAUT. UTAUT, in particular, has proven to be a valuable tool for understanding the factors influencing the adoption and acceptance of new technologies, such as eHealth (D. Gu et al., 2021). However, some have criticized the model for oversimplifying the issue and focusing solely on individual adopters' perceptions, and general intentions. Furthermore, with so many studies using these frameworks, their overall impact on our understanding of the subject has reached a plateau (Shachak et al., 2019). As a result, variants of the model have incorporated more variables. It has been acknowledged that most studies employ this model in conjunction with other theories and that it cannot be used "alone" (Addotey-Delove et al., 2022).

However, assessing the effectiveness of eHealth remains a challenge due to the intricate nature of healthcare services and the many stakeholders involved. Nevertheless, the considerable body of literature on the public value of e-government offers a robust theoretical framework and a clearly defined set of concepts that can be applied to determine the extent to which eHealth applications fulfill the political mandates of government entities and meet citizens' expectations (Gerli et al., 2021). Furthermore, It's becoming increasingly important to understand eHealth as an essential part of e-government (Wirtz et al., 2012).

To fully grasp eHealth, one must also be knowledgeable about public sector management (Chohan & Hu, 2020) and adopt a citizen orientation (Malodia et al., 2021). The government's strategic goals for implementing ICT initiatives such as eHealth go beyond economic and practical considerations, encompassing broader political and social objectives such as promoting trust in government, fostering social inclusion, community regeneration, improving community well-being, and advancing sustainability (Grimsley et al., 2007).

Public value theory has generally been used to evaluate e-government/eHealth services, which are intended to serve the public interest rather than private gain (Gerli et al., 2021). Public value theory is a multidimensional concept that expands beyond economic or financial considerations when establishing public value. In contrast, Moore's initial framework focused on the role of public managers; contemporary experts in public value advocate for a more comprehensive viewpoint. Bozeman, Benington, and Meynhardt stress the social embedding of public value (Meynhardt & Jasinenko, 2021), with Meynhardt adopting a psychological approach grounded in fulfilling basic needs. Meynhardt and Jasinenko contend that Bozeman's concept of public values stems from societal consensus, and Benington defines public value creation as a contested democratic practice contributing to the public sphere. Public value theory shifts the focus of public sector management from internal organizational boundaries to society, emphasizing improving public services to meet the needs of consumers better. Digital

technologies, such as eHealth, aid in achieving this goal by facilitating the shift towards a more society-oriented approach (Panagiotopoulos et al., 2019).

Research on public value has recently taken a more practical approach, but empirical research on the topic has yet to be conducted (Bozeman, 2019). In 2020, Meynhardt and Jasinenko developed a scale to measure public value. Meynhardt's theory is based on Epstein's cognitive-experiential self-theory, which suggests that public value creation stems from any influence on the shared experience between individuals and society. Public value is formed by subjective judgments of basic needs, activated by emotional-motivational states, and generated through experience-intensive actions. Therefore, understanding the process of internalizing values at the individual level and applying them collectively is crucial in public value research (Meynhardt, 2022). Meynhardt's approach provides micro-foundations of public value conceptually linked to the macro-level in four dimensions: moral-ethical, political-social, utilitarian-instrumental, and hedonistic-aesthetical. Overall, Meynhardt's theory offers solid criteria for developing a public value scale (Meynhardt & Jasinenko, 2021).

The dimensions of public value are based on cognitive-experiential self-theory (CEST), a dual-process framework of perception. It is founded on the premise that humans operate using two distinct systems for processing information: analytical-rational and intuitive-experiential. The analytical-rational system moves slowly and deliberately. The intuitive-experiential system operates quickly, automatically, and emotionally. All of those are separate systems that work together to generate action and consciousness(Epstein, 2012). CEST also demonstrated how every human constructs an implicit conception of reality. Epstein outlines four fundamental aspects of functions or "needs" in the absence of a normative assertion of supervenience. Which function, if any, is dominant varies over time and between individuals. Potential conflicts cannot be resolved by using a natural hierarchy (Meynhardt, 2022).

Meynhardt translated psychologically basic needs into core value dimensions. For instance, an evaluation of the effect of public service on an individual's sense of self-worth and self-respect can be regarded as a moral-ethical evaluation. The political-social dimension emphasizes the need for strong interpersonal ties as a fundamental need. The utilitarian-instrumental component denotes the requirement for a conceptual framework that is generally stable and coherent and that one can control. furthermore, the hedonistic-aesthetic dimension explains why every individual seeks to maximize pleasure and minimize pain (Meynhardt, 2009, 2022). But in the ethical dimension, for instance, not all complicated moral-ethical problems may be fully attributable to self-worth effects. Nonetheless, the concept of self-worth is an essential component of any moral-ethical examination. Similarly, the three additional evaluations of need satisfaction can be translated into motives (as an example of psychological "forces") and considered as fundamental value dimensions(Meynhardt, 2022).

Meynhardt and Jasinenko used this information to develop a 12-item scale that public and private organizations can use to gauge how their clients perceive and appreciate public value. however, the hierarchy of values may vary considerably by culture; for instance, preference for the hedonistic-aesthetic component may be more prevalent in prosperous and individualistic societies than in developing nations. The latter may place greater emphasis on the utilitarian-instrumental dimension, while collectivist nations may place greater emphasis on the social-political dimension(Meynhardt & Jasinenko, 2021).

In addition, no other research has extended it to other contexts. Hence, it is imperative to conduct further research to thoroughly comprehend and compare the suitability of the scale for diverse organizations, including governmental health. Additionally, a value theory rooted in human psychology enables a significantly broader examination of the value generation mechanism and the incorporation of other equally significant concepts that could act as constituents and forerunners of (public) value creation, as emphasized by Lindgreen et al. (2019).

Following the previous discussion, this study's model aims to redefine the UTAUT framework by incorporating public value theory's dimensions. The goal is to gain insight into the relationship between UTAUT model dimensions and public value factors influencing Jordanian patients' adoption of eHealth technology (refer to Figure 26). Within the public value scale, hedonistic refers to "a shared value that emphasizes pleasure and generating positive experiences" (Meynhardt & Jasinenko, 2021).

In IS research, hedonic motivation is defined as perceived enjoyment (Ain et al., 2016) and intrinsic motivation to derive pleasure or fun from technology use (Goulão, 2014). Researchers, including Venkatesh and colleagues, have also introduced three new constructs to the UTAUT model based on their research in Hong Kong. One of these constructs is hedonic or intrinsic motivation (D. Gu et al., 2021), which refers to the extent to which technology is perceived as enjoyable. Therefore, both constructs focus on similar aspects: pain avoidance and perceived pleasure in using eHealth technology (Wilson et al., 2021).

As the use of eHealth services continues to grow, it is essential to consider the ethical implications surrounding the technology and the information it stores. Trust, privacy, data protection, ownership, dignity, and equity are all areas where technology and information intersect and must be carefully navigated (Jokinen et al., 2021). These ethical concerns are rooted in the fundamental human need for self-worth and dignity, which are shaped by societal values. Therefore, an eHealth system must prioritize fairness, justice, and respectable behavior to contribute to ethical public value and encourage patients to use it (Meynhardt & Jasinenko, 2021).

In addition, the Utilitarian motivation dimension is a shared value that emphasizes efficiency and the creation of utility (Meynhardt & Jasinenko, 2021). This value is based on the desire for control and consistency in one's environment and is reflected in objective judgments of functional benefits such as money, time, usability, and convenience (Aboelmaged et al., 2021). In the context of eHealth, the Utilitarian dimension is realized when patients derive benefits from using the system, find it easy to use, and believe that the technical infrastructure will support their needs. Interestingly, the utilitarian characteristics of eHealth are particularly prevalent in low- and middle-income nations, where 31–42% of eHealth processes are used to improve communication and geographical access (Putteeraj et al., 2022).

On the other hand, health systems are complicated social systems, with values being a key component of their complexity. Values are typically recognized as key leading change working across all health system components and operations. Moreover, it is recognized that health systems affect and develop social values, giving a chance to utilize health systems to construct communities that are stronger and more united(Whyle & Olivier, 2021).

The need for social belonging forms the basis of social value, which drives individuals to seek positive relationships, social identity, and group membership (Meynhardt & Jasinenko, 2021). In technology adoption, social value plays a crucial role in connecting users with a social group. It encompasses factors such as identification, expression of personality, social image, and pursuit of social class membership (Ashraf et al., 2021).

In contrast, an individual's social status is often evaluated based on their projected image. According to the sociology of consumption, consumption has evolved from traditional goods and production accessories to a form of consumer self-expression, identity signifier, and societal influence. People tend to emulate the consumption behaviors of their superiors and aspirational groups, rapidly adopting innovations embraced by others of similar status to maintain the existing status order (Zhu et al., 2010).

This aligns with the social influence theory, which posits that humans possess volitional control, unlike animals. Thus, the degree to which social norms can influence an individual's social identification and connectedness depends on the persuasive power of these norms. This

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shapes an individual's desire for social interaction and distancing, influencing their level of inclusion or isolation in society (Lim, 2022).

Based on those mentioned above, when the government or "health system" realizes the diversity of people's conditions and requirements and, as a result, empowers them and builds relationships with patients based on transparency and collaboration, all of these criteria will encourage patients to integrate into this society, and their goals will merge with those of society. Furthermore, the general benefits of e-participation are undeniable in terms of strengthening the relationship between a government and its citizens, increasing government transparency, and achieving social inclusion and a democratic society (Alarabiat et al., 2021).

In this study, the Stimulus-Organism-Response (S-O-R) theory is employed to examine how the stimuli associated with eHealth features and benefits affect patients' public value dimensions and subsequent behaviors. The stimuli encompass perceived benefits, quality of eHealth delivery, perceived usefulness, empowerment of patients, social influence, eHealth justice, and privacy concerns, which serve as inputs that impact patients' internal states. These stimuli, in turn, shape patients' public value dimensions, including hedonistic motivation, utilitarian motivation, social value, ethical value, and trust value, ultimately influencing their implementation intention, habit formation, and utilization of the MyHakeem app. Please refer to Figure 26 and Appendix 13 for further details.

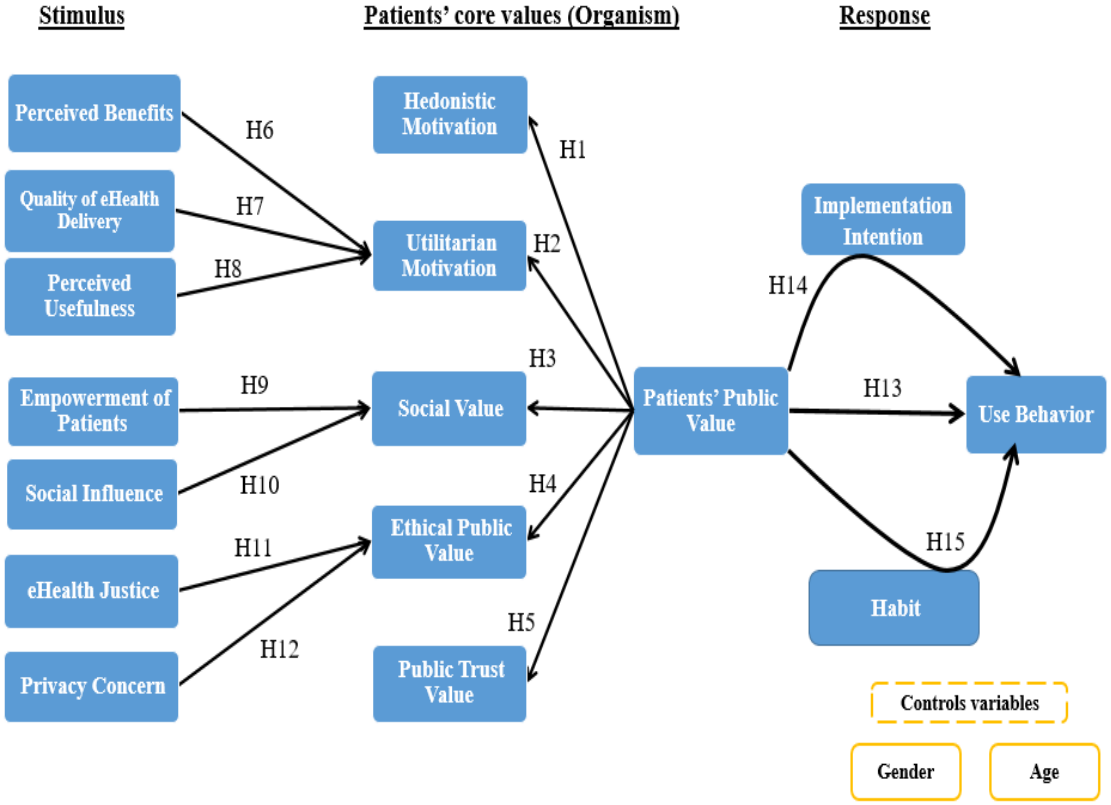

Figure 26 The study model "Patients' Value Model" (PVM).
Source: Author.

2.9. THE STIMULUS-ORGANISM-RESPONSE (S-O-R) FRAMEWORK

The S-O-R framework, which originated from the field of environmental psychology, suggests that external stimuli (S) can affect a patient's internal state (O), which then influences their overall response (R) (Ashraf et al., 2021; Sultan et al., 2021). Stimulus refers to the external environmental inputs that can trigger emotional and behavioral changes in an individual. The organism, the second component of the S-O-R theory, includes an individual's cognitive and affective states that act as mediators between the stimulus and response variables. The

cognitive state primarily refers to an individual's beliefs or values that they use to analyze information about an observed phenomenon. The affective state refers to emotional reactions to stimuli, such as hedonistic responses. Finally, the response factor comprises behavioral outcomes, such as adoption behavior, immediately derived from organismic components (Amin et al., 2022; Oyserman, 2015).

The application of the SOR model in the context of patients' adoption of eHealth technology allows for an examination of the influence of external factors (stimuli) on the internal states, needs, and values of patients (organisms). These internal factors subsequently shape the behavioral reactions (responses) of patients. The SOR model is deemed a highly appropriate theoretical framework for the present study due to the following two justifications: Initially, there has been extensive utilization of this method to investigate the behavioral reactions of users within the realm of information systems, specifically in the field of eHealth. Furthermore, the concept of Stimulus-Organism-Response (SOR) is composed of three primary elements: stimulation, organism, and response. These components are utilized to clarify the process by which patients' behavior is formed. This aligns with the objective of the current study, which seeks to examine the manner in which stimuli associated with eHealth features, such as perceived usefulness, activate patients' public values, such as utilitarian motivation, and consequently result in the adoption of the MyHakeem app (Y. Cao et al., 2020; Zhang et al., 2021).

Due to the fact that eHealth is a technology-integrated platform, its traits, features, and functionality are crucial for determining its quality and safety. Hence, the features of eHealth serve as stimuli that activate the internal motivations of patients. When patients use an eHealth app, the stimuli are the app's related factors and features, which can influence their internal state (patients' values). In the current study, the stimulus is a package of features and benefits (i.e., Perceived benefits, Quality of eHealth delivery, perceived usefulness, empowerment of patients, social influence, eHealth justice, and Privacy Concerns) generated by the eHealth platforms, which in turn affect dimensions of patients' public value for engaging in an eHealth app.(Amin et al., 2022).

In the S-O-R model, the organism stands for the patient's emotional (e.g., hedonistic motivation) and cognitive states (such as utilitarian motivation). It acts as a link between stimuli and responses (Ashraf et al., 2021). At the same time, cognitive states are represented by values, which in turn are internalized cognitive structures that guide choices by evoking a sense of basic principles of right and wrong (e.g., ethical values), a sense of priorities (e.g., social value) and create a willingness to make meaning and see patterns (e.g., trust vs. distrust). Similar to other cognitive constructs, values can be studied individually (Oyserman, 2015). Moreover, value is rooted in the patient and influenced by subjective evaluations of their essential needs. Patients' public value is activated and realized through emotional and motivational states and shaped and sustained through intense and meaningful experiences. In this line of view, the public value of patients is a multifaceted construct that emerges through the evaluation process against their basic needs. It comprises interrelated but distinct dimensions, precisely hedonistic motivation, utilitarian motivation, social value, ethical value, and trust value (Meynhardt, 2009).

Lastly, the response in the S-O-R model relates to the ultimate behavioral outcome of patients, which can manifest as either positive or negative(Pandita et al., 2021). A response can include both attitudinal and behavioral reactions (Ashraf et al., 2021). In this line, Grawe argued that the underlying motivation behind our actions is to fulfill fundamental needs or values, which can manifest in either a healthy or unhealthy manner. Behavior is influenced by motivational schemas, which are the strategies and methods we develop to fulfill our needs. These schemas can be broadly categorized as either approach-driven, stemming from cortical processes, or avoidance-driven, stemming from limbic processes (Dahlitz, 2015; Kostyanaya,

2015). Scholarly studies have posited that the values of users are significant factors in shaping their intentional and habitual utilization of technology. Likewise, research has demonstrated that both intention and habit exert a substantial influence on the utilization of technology (Ashraf et al., 2021). The present study aims to examine the utilization of eHealth applications and the underlying factors that influence it, specifically implementation intention and habit. These factors are considered as outcomes of patients' motivations to engage with eHealth apps.

2.9.1. Hypotheses Related to Patients' Core Values (Organism)

To understand why people, do what they do, and feel what they feel, we need to know what's important to them and what they need and don't need. A central concept concerned with "importance" and "needing" is value (Higgins, 2015). Indeed, values can be understood as abstract representations of desired outcomes that are organized in a hierarchical manner based on how important they are to an individual. Simultaneously, values can be regarded as motivational constructs encompassing individuals' beliefs regarding desirable goals that can be broadly applicable across various contexts and times (Torelli & Kaikati, 2009). Schwartz argues in the Theory of Basic Values that values are beliefs that represent desirable, abstract objectives that motivate behavior by serving as standards by which people evaluate actions, other individuals, and events. Values are trans-situational. In other words, they are applicable in a variety of settings, including the workplace, school, leisure activities, and interactions with friends and strangers. This characteristic differentiates values from norms and attitudes, which refer to particular circumstances (Skimina et al., 2019).

Beyond the basic concepts of value, another vital perspective highlights the relationship between subject and object as the source of value (Ross et al., 2018). This perspective recognizes that value emerges from the interaction between a subject who evaluates and an object that is evaluated. From this perspective, values are not independent of this relationship. Instead, they are subjective and relational. The existence of value depends on the presence of a valuing subject, and the nature and quality of the relationship between the subject and the object determine value.

On the other hand, the object is also involved in the relationship through the valuation process. By evaluating or re-evaluating, a value is created as an abstract concept representing desirability or preference. Ultimately, all values can be traced back to some form of use value, with the process of valuation serving as a prerequisite (Meynhardt, 2009).

The evaluation of the relationship between a subject (individual or group) and an object (such as actions or an information system) is influenced by various forces, with individual needs playing a significant role. These needs act as motivating factors and initiate the evaluation process. The evaluation involves comparing the perceived "actual state" of the subject-object relationship with an ideal or perfect scenario, which can be either real or hypothetical. The force of individual needs has an emotional-motivational aspect, as it stems from the felt discrepancies between the actual and desired psychological states of individuals. In essence, needs are evaluative in nature and can be considered as "values." They represent the deficits or discrepancies that individuals perceive, which generate a motivation to take action. Needs serve as reference points for evaluation, guiding individuals in determining what they should strive for or aim to achieve. (Meynhardt, 2009; Meynhardt & Jasinenko, 2021).

Even so, what precisely constitutes these basic needs? Most prominent personality theories suggest the existence of a single fundamental need. However, Epstein's cognitive-experiential self-theory (CEST) theory integrates different perspectives by regarding four proposed basic needs as equally important (Epstein, 2014): positive self-evaluation, maximizing pleasure and avoiding pain, gaining control and coherence over one's conceptual system, and positive relationships (Meynhardt, 2009). With Epstein's influence, Klaus Grawe formulated a theory of mental functioning that combines mainstream contemporary psychology with the notion that

a person's life objectives ultimately aim to fulfill the aforementioned basic needs (Dahlitz, 2017).

Epstein additionally connected those needs to values, stating that people "implicitly value" when meeting their needs. A value, then, is an experience based on weighing any object against basic needs. They give a simple and robust starting point for developing basic value dimensions. The abstract philosophical concept of "desirability" can be traced back to a concept of human needs. In this view, they are as fundamental as they are essential (not for its own sake): they are about fundamental personality structures that are operationally essential. "Invalidating" them would be damaging to the entire conceptual system (Meynhardt, 2009).

In their investigation, Meynhardt and Jasinenko (2020) employed these basic needs as a starting point for developing a scale of public value. Their study presents a conceptual framework for public value, which is defined by the relationship between the subject and the object, specifically the connection between society and individuals. In other words, public value is rooted in the relationships between the individual and society, determined by individual evaluations of basic needs, sparked by and realized in emotional-motivational states, and created and recreated through practices that are heavily reliant on personal experience(Grubert et al., 2023). Consequently, this framework is subjective in nature and non-normative. In more details, Meynhardt and Jasinenko take Meynhardt's definition of public value and developed a twelve-item public value scale, and using it empirically to evaluate its potential. The aforementioned conceptual framework offers subjectively based micro-foundations of public value that are conceptually linked to the macro-level (i.e., the public level) and are organized in four psychologically based dimensions: moral-ethical, political-social, utilitarian-instrumental, and hedonistic-aesthetic. According to the authors, this notion of public value rooted in basic needs is not restricted to any one institutional sector or cultural setting. They argue both for its broad applicability and for the need for more empirical studies in various contexts going forward (Spanò et al., 2023).

One of these contexts, to apply the previous concept, is the healthcare domain, in particular eHealth (Gerli et al., 2021). In recent years, rising pressures have put health systems worldwide under scrutiny as a result of various factors such as the emergence of pandemics, rising costs, shifts in scientific, political, and economic landscapes, as well as ethical concerns and the need for enhanced patient safety and well-being (Spanò et al., 2023).

Healthcare services are thus increasingly moving towards a safer, patient-centric eHealth system that prioritizes patients' preferences, needs, and values. This shift involves adopting a biopsychosocial approach, which considers not only the biomedical aspects but also the psychological and social factors. Additionally, it emphasizes the importance of establishing a robust partnership between the patients and these applictions so that their relationship becomes a cornerstone in the provision of care (Black et al., 2014; Greene et al., 2012; Schiza et al., 2015). Despite this shift, there exists a certain degree of reluctance among patients to accept eHealth. As emphasized by Bullock and his colleagues, the global adoption of eHealth applications is currently experiencing a delay. Kim and his colleagues have furthered this argument, positing that a low rate of patients' adoption may suggest that optimal strategies have not yet been identified for the effective implementation of telemedicine applications (Rahi, 2022).

Consequantly, the current study introduces the concept of patients' public value, which is based on the value concept proposed by Epstein, Grawe, Meynhardt, and Jasinenko, the concept of patients public value can be understood as the value experienced by patients in the context of their relationship with the eHealth system. This value is rooted in the patients, influenced by subjective evaluations made in relation to their basic needs. Patients public value is activated and realized through emotional and motivational states, and it is shaped and sustained through experiences that are intense and meaningful. The patient public value

perspective recognizes that the value experienced by patients is not solely determined by the objective features or functionalities of the eHealth system. Instead, it highlights the subjective nature of value and the critical role of the patients' own evaluations, needs, and emotions in shaping their perception of value. It emphasizes the dynamic and interactive process between the patients and the eHealth system, where value is continuously produced and reproduced through ongoing experiences and practices.

In line with Epstein and Meynhardt's work, the public value of patients is a multifaceted construct that emerges through evaluating their essential needs. It comprises interrelated but distinct dimensions, precisely hedonistic motivation, utilitarian motivation, social value, ethical value, and trust value. The initial four values are directly derived from the studies conducted by Meynhardt (Meynhardt, 2009; Meynhardt & Jasinenko, 2021). For in-depth insight, see the below sections.

On the other hand, the trust value is derived from Epstein's work, wherein he posits that personal theories of reality are composed of a hierarchical structure of schemas or implicit beliefs organized into cognitive-affective networks. At the uppermost echelons of the hierarchy structure are highly general implicit beliefs, such as that the self is worthy and people are generally trustworthy (Epstein, 2012, 2014). The value of trust is placed in the higher-order or more generalized schema of persons (Dweck, 2017).

Furthermore, when patients collectively embrace and share these five values, they become public. In other words, If different patients share similar evaluations (i.e., arrive at similar narratives or meanings), a value becomes "objective." This objectivity is, however, still bound to subjects and, therefore, "vulnerable" to change and continuous revision in discursive practices and communication (Meynhardt, 2009). Consequently, this lens enables the integration of both micro- and macro-levels of adoption in eHealth initiatives.

2.9.1.1. Hedonistic Motivation

As per classical Freudian theory, the pleasure principle was considered the most fundamental needprior to the introduction of the death instinct, which refers to the pursuit of pleasure and the avoidance of pain. Recently, the view in CEST theory regarding basic needs was updated by adding a new basic need. This new need is to behave in accordance with the hedonic principle, which means seeking positive emotions and avoiding negative ones(Epstein, 2014). According to Meynhardt and Jasinenko (2020), hedonistic motivation refers to the value placed on pleasure and the desire to create positive experiences. In information system (IS) research, hedonic motivation has been defined as perceived enjoyment (Ain et al., 2016) and the intrinsic motivation of an individual to obtain pleasure and enjoyment from engaging in activities involving technology (Goulão, 2014). Consequently, it stems from the profoundly ingrained evolutionary desire to minimize pain and increase pleasure in order to survive.

In the context of eHealth, hedonic motivation is important to eHealth consumers, and it could even be a sufficient reason for adoption (Goulão, 2014). Additionally, hedonic value is non-instrumental but experiential and affective. Customers experience hedonic value when the activity of utilizing (IS) is valued for its own sake, apart from its utilitarian value. Empirical research on information systems has demonstrated that users' perception of hedonic value is an important factor in the context of IS use, particularly in eHealth (Kim & Han, 2011; Alzahrani et al., 2022). In addition, Talukder et al. (2020) discovered that hedonic motivation was the driving force behind users' positive perceptions of healthcare IT and services.

In light of this context, the present study aligns with Meynhardt's perspective on the values and needs of individuals. In the words of Meynhardt (2009), evaluation is inherently intertwined with basic human needs. Needs refer to the perceived insufficiencies or deficiencies in an individual's psychological state, wherein there exists an apparent disparity between the current state and the desired state. These disparities subsequently generate a motivational

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response, prompting the individual to engage in actions aimed at addressing and fulfilling these needs. Needs play a crucial role as actual or hypothetical standards for assessment; they serve as the essence of the "ought". Consequently, the assessment of individuals' values is shaped by the satisfaction of their fundamental needs, whether explicitly or implicitly. When a patient assesses the behavior of an eHealth application as contributing to their subjective need fulfillment, they will tend to evaluate it positively. In the absence of such fulfillment, individuals experience psychological discomfort, which has the potential to undermine value and consequently lead to a negative assessment of the individual (Meynhardt, 2021; Meynhardt & Jasinenko, 2021; Meynhardt & Metelmann, 2009).

In light of the aforementioned context, when patients perceive that the eHealth application effectively satisfies their hedonistic needs and elicits positive emotions, it increases the likelihood of fostering a positive hedonistic motivation, subsequently enhancing the public value of patients. Conversely, in the event that the eHealth app is unable to satisfy individuals' hedonistic needs, it can result in psychological distress and a pessimistic assessment. Consequently, this diminishes hedonistic motivation and undermines patients' perceptions of the value of eHealth applications. As result, study proposed: *H1: The hedonistic motivation that the MyHakeem system triggers is reflected in the patients' public value.*

2.9.1.2. Utilitarian Motivation

Utilitarian value relates to the level of effectiveness and efficiency that consumers perceive when utilizing information systems(Al-Debei, 2013). However, the desire for pleasure, joy, and enjoyment generates hedonistic consumption, whereas the desire to solve problems and meet needs and wants stimulates utilitarian consumption. Even though in most circumstances both hedonistic and utilitarian incentives influence consumption decisions, either hedonistic or utilitarian motivation has been proven to dominate the decision-making process(Nattuvathuckal et al., 2020). In contrast, Motivation Theory postulates that hedonistic and utilitarian motivations influence people's behaviors, such as their usage of eHealth(Ashraf et al., 2021; Guo et al., 2015; Heinsch et al., 2021). In public value creation, the utilitarian-instrumental dimension represents a collectively shared value assigned to utility and what it means to efficiently create a benefit. It is based on the fundamental demand for control and coherence in one's conceptual framework, therefore referring to people's ability to comprehend, predict, and exert control over their surroundings (Meynhardt & Jasinenko, 2021). In this perspective, there are two drivers that make up the instrumental-utilitarian profile regarding services, which are, is it useful? and is it profitable? (Lindgreen et al., 2019).

Utilitarian services, on the other hand, as a category of service, are more logical and functional in nature, satisfying consumers' essential consuming demands(Nattuvathuckal et al., 2020). As outcome-oriented characteristics, it considers the usefulness, quality, performance, and predictability of the participation process, which can enhance the main service outcome(Blinda et al., 2019). eHealth services have utilitarian benefits, especially in their ability to store and access health records. This feature can incentivize individuals to develop favorable attitudes towards health technologies and trust them.(Alzahrani et al., 2023).

eHealth app can create patients' public value (through utilitarian motivation) by offering dependable and efficient services that aid society in addressing its health concerns. Particularly in Jordan, where nearly 24% of 40-to-69-year-olds had a 10-year cardiovascular disease (CVD) risk of greater than 30% or already had a CVD. On the other hand, 18% of the population had depression, with 6.5% of patients receiving therapy(Ministry of Health, 2019). Consequently, the application and exploitation of ICTs in the health care sector could significantly enhance patient-centeredness and care integration, which are fundamental aspects of multimorbidity care.

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As widely acknowledged, eHealth drives innovation in the health and social care systems, resulting in several benefits for individuals with chronic conditions. It enhances the overall quality of life for patients and their family caregivers, optimizes resources to improve the effectiveness and efficiency of care systems, and indirectly benefits Jordanian societies by providing more appropriate care (Barbabella et al., 2017).

The current debate takes us back to the psychological concept proposed by Meynhardt and Jasinenko (2020) regarding utilitarian motivation. The idea behind it is grounded in the basic need that humans have for control and coherence within their conceptual systems. Specifically, it relates to the patient's capacity to understand, expect, and exert influence over their environment. Consequently, this process contributes to the establishment of a patient's public value in relation to the utilization and acceptance of eHealth. Therefore, the study posits: *H2: The utilitarian motivation that the MyHakeem system triggers is reflected in the patients' public value.*

2.9.1.3. Social Value

Public value is centered around contributing to society's well-being as perceived by individuals. It heavily relies on the perception and connections that organizations establish. Epictetus, a philosopher from the second century, once said that individuals are disturbed not by things but by their perspectives of them (Lindgreen et al., 2019). According to Meynhardt, the social aspect of public value represents a shared value related to how we interact with one another and the importance of cultivating positive group relationships. People seek to maintain healthy relationships, social identity, and group membership as they have a basic need for social belonging (Meynhardt & Jasinenko, 2021).

In order to create public value, it is essential to consider how the public perceives and evaluates society as a whole. This idea of the "public" refers to the shared mental representation of the community and its values. Essentially, the public is not just a group of individuals but a state of mind influenced by various organizations and their actions. This perspective is based on contemporary psychological theories of basic human needs. At the same time, public value focuses on contributions to society as a whole; human needs are rooted in the basic psychological level that underlies all social assessments (Meynhardt, 2019). Regarding technology adoption, social value is essential as it connects users to a larger social group and includes factors such as identification, personality expression, social image, and membership to a particular social class (Ashraf et al., 2021).

In contrast, society tends to evaluate an individual's status based on their projected image. According to the sociology of consumption, consumption is not just about buying goods and production accessories but also a form of self-expression, identity, and a dominant societal factor. People tend to imitate the consumption habits of those in higher social classes and those in aspirational groups. They are also quick to adopt innovations used by others of similar status to maintain their current social standing (Zhu et al., 2010).

Additionally, perceived social value refers to the experience of improving a social relationship through the use of technology services. As a result, consumers would find it easy to derive social value from utilizing technology contents, especially those that are socially or publicly popularly recommended (Youn & Lee, 2019).

In the eHealth context, the proliferation of digital health platforms and online health communities has led to a dramatic increase in patient participation in the health care domain (OHCs). For healthcare providers, the opportunities and threats presented by patient-driven service innovation are equal. A growing body of literature over the past five years has highlighted the significance of patient and other stakeholder participation in the creation of value in health care services (Rezaei Aghdam et al., 2020). Users of health platforms create financial, ethical, epistemic, and other types of value through their interactions with one

another and the platform's infrastructure, such as their willingness to assist other patients and the dissemination of health information, all of which contribute to the platform's value. Furthermore, user ratings of healthcare providers, social connections, tracking of patient feedback and outcomes, and user profiling are all methods and techniques for generating social value from health technologies(Barrett et al., 2016; Chamakiotis et al., 2021). Chamakiotis et al. 2021 investigated how online health communities generate social value by connecting individuals around a common goal to promote healthcare in post-conflict areas. They discovered that social value is formed in this context through three categories of non-economic social value: cognitive, professional, and epistemic. Social value can be created through philanthropic, moral, and reciprocal activities, which are three new ways to engage with digital health. Oyibo et al. (2022) conducted systematic reviews to identify factors that researchers should focus on in the future to increase the adoption of contact tracing applications (CTAs) in combating COVID-19 spread. They discovered that the more people cared about the wellbeing of others (social and health), the more likely they were to employ CTAs to accelerate the containment of COVID-19. In the same way, other researchers have discovered that subjective norms (such as the notion that friends and/or social influencers expect one to install a CTA) positively influence the desire to use CTAs.

In sum, the patients attempt to create social value by utilizing the eHealth app to maintain healthy relationships, social identity, and group participation in accordance with their basic need for social belonging, and this reflects in their public value. Consequently, the study hypothesized that: *H3: the social value created when patients use the MyHakeem app is reflected in the public value of patients.*

2.9.1.4. Ethical Public Value

Ethics lie at the heart of the values that guide health care delivery (Townsend et al., 2015). Like Justice, Privacy(Farhud & Zokaei, 2021; Varkey, 2021), and Human dignity (Shahriari et al., 2013). The identification and protection of ethics in eHealth services from the standpoint of service users in social care and healthcare is essential (Jokinen et al., 2021). Ethics in relation to health information is not a new phenomenon, but the use of technology in healthcare presents a multitude of new ethical concerns that must be addressed. Individuals lose direct control over the process of storing and sharing health data. This impacts a number of issues that must be resolved if eHealth is to be successful in the long term (Kip et al., 2018). On the other hand, the evolution of eHealth introduces a slew of fresh promises and concerns. The required ethical reflection in this context must not obstruct innovation but rather build prospective scenarios that allow us to choose how we evolve in medicine and as a society.(Kleinpeter, 2017). Other researchers have also proposed that the assessment of eHealth services should combine the concept of public value with that of social justice and include privacy, security, and accountability (Gerli et al., 2021). In this context, "public value" refers to concepts or moral or sociocultural standards that people hold to be just or right. Values, according to this point of view, are both external normative and personal normative commitments (e.g., moral or ethical) that can motivate or explain various behavioral choices. (Baker et al., 2021; R. J. Holden & Karsh, 2010). Social/Public values have ethical status. In other words, a social value is anything that says we should act in a manner consistent with that value. Values are moral ideals that should be adhered to if possible. There are numerous such values, and they may frequently be in conflict. For instance, the common value that available health and social care resources should be used to have the greatest potential impact on population health may conflict with the value that these resources should be geographically distributed equitably. Some say that achieving as much equality as feasible in the distribution of health in the population is a more essential social aim than achieving equality in the distribution of resources. However, this may entail an unequal distribution of

resources to ensure that those who are the least healthy but are nonetheless able to benefit from health and social care receive a proportionally bigger part. Therefore, we must consider why equality and inequality are important (Culyer, 2014). In this context, The Citizens Council highlighted the significance of individual freedom of choice and respecting the values, cultural attitudes, and religious beliefs of individuals. However, it acknowledged that occasionally it may be necessary to limit individual choice in the benefit of the entire population. Although NICE agrees that respect for autonomy and individual choice are crucial for the NHS and its users, this should not result in recommendations suggesting interventions that are neither clinically nor economically beneficial (Britain, 2008).

In the realm of eHealth literature, Gerli et al. (2021) have noted a potential conflict between individuals' right to privacy and the public benefits derived from the collection of personal data. While the risks associated with CTAs have been thoroughly discussed and mostly mitigated through a decentralized model and GDPR compliance, our research has indicated that symptom checkers and health-monitoring apps also pose a privacy threat to their users. These apps collect a vast amount of sensitive data, often stored for extended periods and shared with third parties. While this sharing is expected to benefit the public and healthcare providers, it may conflict with the rights of individual users. Thus, it is crucial to address ethical concerns in eHealth (Kip et al., 2018).

However, the concept of ethical public value is rooted in the basic human need for self-worth and dignity. Therefore, the assessment carried out by patients regarding the impact of certain eHealth services on their self-worth and positive self-regard can be considered an ethical public value. This dimension encompasses the manner in which an eHealth application interacts with patients, particularly in terms of the extent to which it promotes and improves patients' sense of self-worth and dignity. In order to enhance the ethical dimension of patient public value, it is imperative for the MyHakeem application to exhibit behavior that is fair, just, ethically sound, or at the very least, morally acceptable (Meynhardt & Jasinenko, 2021). The following hypothesis was thus put forth: *H4: The ethical public value of the eHealth system (MyHakeem) is reflected in patients' public value*

2.9.1.5. Public Trust Value

Numerous studies have highlighted trust as a critical determinant in social and economic advancement, as well as democratic stability (Alessandro et al., 2021). Enhancing trust and confidence in government is vital to creating public value. The public deems trustworthiness as a crucial aspect and a strong bond of trust between the governed and the government is paramount. When citizens trust their government, it legitimizes government actions and creates public value in other areas. For instance, trust in doctors is vital to delivering public value in healthcare. No matter how skilled a doctor is, improving health outcomes or enhancing patient satisfaction depends on trust. Patients must trust that the correct course of action is being taken, while doctors must trust patients to be confident in their diagnoses and believe that treatment will be effective. Any mistrust in this relationship would inevitably reduce public value (Bend, 2004).

However, trust is notoriously challenging to define. Despite decades of research, the literature has not yet produced a widely accepted definition. This is not due to a lack of effort. In the context of health alone, Vega, DeHart, and Montague discovered 49 unique definitions of trust. Supposedly, there are many more attempts to be made, which will differ greatly from one another. Nonetheless, some definitions are useful because they build upon the few elements upon which the literature has reached a consensus. After all, trust is not an entirely unknown concept, and the frequently cited definition by Rousseau, Sitkin, Burt, and Cramer is a suitable option within the context of eHealth adoption. According to their definition, trust is "a psychological state consisting of the intention to accept vulnerability based on positive

expectations of the intentions or behavior of another under conditions of risk and interdependence" (Ehrismann & Stegwee, 2015). In the public value sphere, though, trust has a broader meaning; it is the third most important source of public value (Faulkner & Kaufman, 2018; Kelly et al., 2002).

Trust refers to the degree to which the public and critical stakeholders perceive an organization (the government) and its activities (the eHealth initiative) to be trusted and legitimate (Faulkner & Kaufman, 2018). It lies at the core of the relationship between citizens and government. It is essential regarding services that influence life and liberty, such as health. However, it is also essential for many other services. A lack of trust will eliminate public value even if formal service and outcome goals are accomplished in certain instances (Kelly et al., 2002).

On either hand, trust has developed into an essential component in relation to cutting-edge eHealth technologies (Van Velsen et al., 2021). It is widely held that creating an atmosphere of trust in eHealth services is one of the most important things that can be done to increase the likelihood of successful technology implementation (Arfi et al., 2021). When it came to discussing health-related Internet information (HRII) with healthcare professionals (HCPs), patients placed a high value on trust, which in turn encouraged them to participate (Townsend et al., 2015). Trust must therefore be present in eHealth in such a way that citizens are reassured that data is being processed correctly, that it is up-to-date and of high quality, and that security risks are being considered. In other words, eHealth must provide citizens with the confidence they need to use it (Jokinen et al., 2021). Despite this, research on the nature and scope of public trust in health care systems is rare (Gille et al., 2014).

In general, trust in social provision institutions is tied to expectations about specific activities, such as how the National Health Service NHS will handle one. Thus, the examination of individual instrumental and more normative and expressive trust accounts conforms to the prior assessment of agency perspectives. In the instrumental rational model of agency, people behave to further their interests. A trustor can forecast a trustee's actions based on this. As a result, I can predict whether your activities will align with my interests, or "encapsulate" mine, as Hardin puts it (TAYLOR-GOOBY & WALLACE, 2009).

An alternative perspective posits that trust possesses intrinsic value rather than serving solely as a means to an end (Provis, 2001). Trust is widely recognized as a core value and a belief in the higher-order or more generalized schema of personhood such as that the self is worthy and people are generally trustworthy (Epstein, 2012, 2014). Trust is commonly understood to encompass both affective and cognitive aspects. Furthermore, trust is important to foster meaning and see patterns, such as the dichotomy between trust and distrust (Oyserman, 2015).

Therefore, the trust value dimension, as an integral component of patients' public value, influences their willingness to make meaning and perceive patterns within the eHealth system. Trust engenders a positive and receptive mindset that enhances patients' overall experience, utilization, and understanding of the system. By valuing trust, patients are more likely to embrace the system, interpret information, and identify meaningful patterns, contributing to a more fruitful engagement with the eHealth system. Consequently, the study hypothesized that**:** *H5: the public trust value generated by using the Hakeem app reflects the patients' public value.*

2.9.2. Hypotheses Related to Determinants of Patients' Public Value (Stimulus)

In the context of technology adoption and use, stimuli influence patients' value (i.e., organism) and eventual response behavior (Ashraf et al., 2021). The evaluation and perception of the eHealth system by patients are influenced by a range of factors that encompass the determinants of public value. Utilitarian motivation, as one dimension of patients' value, is

determined by their perceived benefits, the quality of eHealth delivery, and perceived usefulness. Social value, another dimension, is influenced by patient empowerment and social influence. Additionally, ethical public value is affected by the presence of eHealth justice and privacy concerns. The subsequent sections of this study provide a comprehensive analysis of these motivational dimensions, along with a theoretical rationale for their expected impact on the patients' public value derived from the utilization of eHealth applications by patients.

2.9.2.1. Perceived Benefits, Quality of EHealth Services

Perceived value is "the consumer's overall assessment of the utility of a product or service based on perceptions of what is received and what is given." In other words, consumers' perceived value is derived from all relevant "gets" and "gives" (Zhu et al., 2010) or the trade-off between price and quality (Sweeney & Soutar, 2001). From a utilitarian perspective, consumer value perception comprises the acquisition and transaction values associated with goods or services (Zhu et al., 2010). Zeithaml asserted that the cost and quality of a product affect the customer's perception of the value of a product or service (Boztepe, 2007; J. Park & Han, 2013). Moreover, in Sweeney and Soutar's value framework, perceived cost is included in functional value as price (value for money), which is defined as the utility derived from the product as a result of the reduction of its perceived short- and long-term costs (Zhu et al., 2010).

Moreover, instrumental-utilitarian contributions are essential to society, including efficient capital allocation. Nevertheless, it requires solid social legitimacy. For instance, the widespread mistrust of shareholder value in public companies is wider than the size of shareholder value or the short and long-term balance. It also extends to the concept of shareholder value itself. Although the profit motive is socially constructed, people are motivated to achieve optimal cost-benefit ratios, with money to some extent signaling this (Meynhardt & Jasinenko, 2021).

On the other hand, given that clients expect utilitarian services to satisfy particular needs, it is likely that they will cognitively evaluate the use of these services. Due to their cognitive qualities, utilitarian services are often evaluated based on service quality metrics; hence, the service outcome is evaluated based on service excellence. Researchers have argued in the past that perceived quality is a factor that positively influences perceived value (Nattuvathuckal et al., 2020).

Within eHealth, evaluating the efficacy of interventions can involve combining the benefit-and-sacrifice methodology utilized in marketing with the value-based healthcare philosophy, which evaluates patient outcomes about cost. In this context, benefits may take the form of financial gains or savings and the overall quality of eHealth services provided. There are monetary sacrifices, which are the outlays of money, and nonmonetary sacrifices, which are the costs to society (such as the time or energy required to do the service). It may be useful to include the context, which is often overlooked in eHealth research (Jurkeviciute et al., 2020).

In a consumer-use context, price is significant since consumers must consider the acquisition costs associated with products and services. Patients can save time and money by avoiding unnecessary trips to the clinic or hospital if they can get their test results online through an Electronic Health Record (EHR) portal. Americans who must pay out-of-pocket or through health insurance tend to prioritize costs more (Tavares & Oliveira, 2017).

mHealth also provides cost- and time-efficient services to all stakeholders (especially patients) in the healthcare delivery value chain, increases data gathering, and significantly expands and enhances access to services for individuals living in resource-poor situations. Many low- and middle-income countries have invested extensively in mHealth because of these advantages and the increased availability and connection of mobile phones in developing countries(Addotey-Delove et al., 2022).

Moreover, cost-effective interventions to reduce the impact of non-communicable diseases NCDs are widely available, and their implementation can avert premature death and

prevent economic losses, estimated to account for USD 7 trillion over the timeframe of 2015-2030 (Health, 2019). Moreover, eHealth provides patients with numerous advantages, including enhanced health, well-being, and quality of life; enhanced access to healthcare services (Barbabella et al., 2017); and improved health conditions at a reduced cost. In addition, it removes the waiting periods, travel durations, and travel expenses that patients incur while seeking in-person health consultations (Almathami et al., 2020). Hence, we hypothesize that *H6: The perceived benefits of eHealth will positively affect patients' utilitarian motivation to use it.*

Moreover, H7: The perceived quality of eHealth services will positively affect patients' utilitarian motivation to use eHealth.

2.9.2.2. Perceived Usefulness

Perceived usefulness measures the extent to which patients believe that utilizing a specific system will improve their job performance (Beldad & Hegner, 2018). By integrating the qualities of eHealth, perceived usefulness can be used to define the extent to which patients believe that eHealth tools, such as OMWs, help resolve their issues (Y. Tang et al., 2019). Moreover, the term perceived usefulness (PU) is similar to performance expectancy (PE) in the UTAUT model (Hamzat & Mabawonku, 2018). In this context, Holden & Karsh (2010) conducted a systemic review of the technology acceptance model, and they observed that no study used a broader definition of usefulness, even though health IT may be helpful not only for enhancing performance but also for making performance easier, more satisfying, and more efficient. Unlike definitions based on those in Davis's original TAM, those based on UTAUT did not emphasize personal performance, but neither did they mention performance advantages for other care team members, referring specialists, or patients' relatives. From either definition, it was unclear whether usefulness referred to improved performance procedures (e.g., fewer steps, more information for decision-making) or improved performance outcomes (e.g., faster care, more accurate decisions).

In contrast, Arfi et al. (2021) investigated wearable medical devices; their findings show that performance expectancy (PE) can be understood as the extent to which the device can aid users in monitoring their daily physical state, developing self-care plans, and limiting health risks. Consequently, a rise in patients' PE of innovative healthcare devices, such as the perception of more effective health management, improved access to healthcare services, and a higher quality of life overall, is expected.

Nevertheless, eHealth technology usability concerns may originate from technical aspects, such as human-computer interaction, or social ones, such as users' perceptions of the technology's usefulness in attaining their operational objectives (Fanta et al., 2016). If a service such as eHealth truly addresses a problem or satisfies a customer's need, use value is created because a fundamental utilitarian human need is met. Identifying if a remedy solves a meaningful problem from a societal standpoint is more complex than ever. The concept of what is or is not useful has become a topic of discussion in the public sphere. Although products and services may solve a "problem" effectively, society may regard this as decadent or a waste of resources. Imagine the repercussions if society rejects what technological development has uncovered or what engineers have developed (Lindgreen et al., 2019). Thus, the study hypothesized that *H8: The perceived usefulness of eHealth will positively affect patients' utilitarian motivation to use eHealth.*

2.9.2.3. Empowerment of Patients

Patient empowerment can be characterized in varied ways that reflect multiple viewpoints, such as that of governments, health professionals, and patients, and consequently can result in goals and outcomes that are weighted differently. According to its Strategic Plan

2014–2020, patient empowerment is one of Forum European Patients' EPF's primary goals: "To promote the development and implementation of policies, strategies, and healthcare services that empower patients to be involved in decision-making and the management of their condition according to their preference, whilst raising awareness of their rights and responsibilities." (Forum European Patients, 2015) nonetheless, WHO defines empowerment as "the process through which people gain greater control over decisions and actions affecting their health" and it should be viewed as both an individual and community process (WHO, 2009).

Gutiérrez et al. have developed the concept of empowerment by combining the ideas of several authors, which has four main aspects (Vainauskienė & Vaitkienė, 2021):

- Empowerment consists of both theory and practice that deals with power, powerlessness, and oppression, and how they contribute to the issues faced by individuals, families, or communities, and how they affect relationships aimed at providing assistance.
- Empowerment aims to increase the power of individuals, families, or communities in personal, interpersonal, or political contexts so that they can take action to improve their situation.
- Empowerment takes place in a process that occurs at the individual, interpersonal, and community levels and includes sub-processes such as developing group awareness, reducing self-blame, taking personal responsibility for change, and improving self-efficacy.
- Empowerment interventions include building relationships based on cooperation, trust, and shared power; raising awareness; involving individuals in the process of change; providing training in specialized skills; and mobilizing resources.

In addition, patients cannot be empowered until they have obtained sufficient information, comprehend how to use the information, and are convinced that this information grants them joint responsibility with their healthcare providers (WHO, 2009). Patients who are empowered may have a better sense of self-efficacy towards various diseases and treatment-related behaviors, as well as changes in life goals and values. Patients are expected to better manage not only their condition but also their life as a result of their empowerment process (Aujoulat et al., 2007).

Nevertheless, two distinct levels of patient empowerment exist. Firstly, on an individual level, patients must accept and understand their chronic illness, allowing them to make informed decisions and take control of their health. Secondly, on a community level, patients can support and empower one another by sharing their experiences and insights (Vainauskienė & Vaitkienė, 2021).

Community empowerment comprises three main components, and the absence of even one makes it impossible. The first component is a micro-component that includes intrapersonal aspects like patient self-esteem and self-efficacy. The second component is mediating structures that consist of mechanisms specific to groups of individuals and the active participation of group members in sharing knowledge and growing their critical consciousness. The third component is the macro-component, which encompasses social structures and institutions.

Community organizations are based on a participatory decision-making paradigm in the patient empowerment framework to achieve community-focused health improvement goals. Communities design various initiatives to achieve their health-related objectives by leveraging their strengths and collective efforts. As per this perception, a community organization is a system that includes the components of the organization highlighted in the contemporary organizational theory framework and the processes that connect them to achieve a common objective. Ultimately, patient empowerment occurs at every level, and the primary outcome of patient empowerment is the psychological empowerment of people, followed by the

empowerment of the community by creating organizations, including stakeholders, that interact to achieve health-related goals (Vainauskienė & Vaitkienė, 2021).

Within the realm of healthcare literature, scholars have explored the potential for technology to promote patient empowerment and have considered how this concept may need to be redefined within the context of eHealth (Risling et al., 2017). According to Vainauskienė & Vaitkienė, (2021), health technologies enable patients to self-manage chronic diseases in their daily lives, thereby facilitating the process of building patient knowledge and empowering individuals to make informed decisions about their health. In addition, eHealth provides patients access to medical knowledge and electronic data via the Internet, promoting patient-centered medicine and evidence-based decision-making (Eysenbach, 2001). Recent research has shown that virtual communities can effectively encourage eHealth literacy and patient empowerment for individuals with diabetes and heart disease, as these platforms allow patients to ask questions and share personal experiences (Gee et al., 2015).

Patient empowerment strategies positively impact healthcare outcomes and are likely to shape the future of medical practice (Risling et al., 2017). Furthermore, eHealth can facilitate the exchange of valuable information among patients with similar conditions. Medical empowerment is derived from making electronic medical records (EMRs) accessible to patients, while personal health empowerment results from the availability of electronic health record (EHR) data (Anshari et al., 2021).Thus, we hypothesized that the *H9: Empowerment of patients offered by eHealth will positively affect perceived social value.*

2.9.2.4. Social Influence

Researchers found that individuals may be significantly affected by others, particularly when it comes to adopting prosocial behavior—actions that help society as a whole (Abel & Brown, 2022; Haller et al., 2022; Jung et al., 2020; Reyniers & Bhalla, 2013). And it is notable that in many instances, people's judgments on whether or not to behave prosocially are significantly impacted by what they perceive others doing at that time. The findings of the Abel and Brown research indicate that this might build up a dynamic that magnifies the consequences of private activities, given that individuals prefer to imitate the actions of others (Abel & Brown, 2022). Observing the altruistic conduct of others inspires altruistic action through prosocial goal contagion. Understanding this is crucial today, when large-scale cooperation and the adoption of preventive behaviors, like wearing face masks and avoiding gatherings, have significant ramifications for the health of whole communities, according to Jung et al. Similar to the transmission of a fatal virus, cooperative conduct may likewise be spread between individuals (Jung et al., 2020). In contrast, social influence evaluates the amount to which a person perceives the importance others place on his or her utilizing the new system (Gadabu et al., 2019). In eHealth, it is the degree to which society influences the usage and acceptance of an eHealth application. The choices of consumers are influenced by social variables, such as word-of-mouth, friends, family, and others in their social network (Algumzi, 2022). Also, it is reliant on a vast range of temporary stimuli, with three processes influencing individual behavior: compliance, internalization, and identification. The compliance mechanism is responsible for adjusting an individual's purpose in response to social factors, whilst the other two mechanisms are concerned with altering and revising an individual's belief system and/or initiating the individual's reaction to potential situational advantages. Thus, acceptance or resistance to change may occur due to the influence of peers (Gadabu et al., 2019).

In this context, "social value" refers to the utility obtained from a product's or service's capacity to increase a social self-concept, such as feelings of group membership or enhanced social interaction (Laukkanen & Tura, 2022). In addition, Sweeney and Soutar defined social value as the benefit received from a product or service's capacity to improve social self-concept

(McGowan et al., 2016). The TAM2, UTAUT, and UTAUT2 also investigate social influence (A. Chang, 2012; Lu et al., 2005; Rouidi et al., 2022; Wills et al., 2008). The results indicate that individuals are more inclined to utilize a service whose design is appreciated by their peers.

In contrast, the findings of Jung et al. 's research remind the public that their conduct may influence what others around do, and the more individuals collaborate to adopt a certain behavior, the more probable it is that others nearby will do the same. Reviewing years of studies, the researchers discovered that exposing people to "prosocial models"—that is, witnessing someone do an act of kindness—led to some later acts of goodness. This reaction was influenced in part by "goal contagion," according to the authors, whereby observing prosocial activities causes individuals to embrace the underlying goal connected with the observed behavior, such as caring for the well-being of others. "We discovered that individuals may quickly improvise novel prosocial acts. They engaged in activities that differed from those they observed and gave aid to different indigent targets than those assisted by the prosocial model ". This form of impact varied in intensity among civilizations, with Asian countries having the highest likelihood of being influenced by modeling, followed by European nations, and finally North America (Jung et al., 2020). People were more inspired to help when they saw the success of the prosocial model in the lives of others, as demonstrated by Jung et al., 2020. This demonstrates that adopting others' prosocial aims had a more significant impact than any conceivable reasons driven by self-benefit, such as doing it because they felt grateful. Patients may also consider others to be important, such as family members or physicians(Arfi et al., 2021). The following hypothesis was thus put forth: *H10: Social influence by eHealth users will positively affect perceived social value and well-being.*

2.9.2.5. EHealth Justice

Health justice is something that every nation on earth requires. However, differences in health between different social groups and geographical locations are unavoidable in many countries around the world. These health disparities provide a significant barrier to attaining health justice. Numerous governments and healthcare organizations have devised strategies to achieve health fairness, the most significant of which is the utilization of information technology (eHealth) (Moghaddasi et al., 2017). Global health systems are progressively strengthened by digital health technologies. Kickbusch refers to the ongoing digital transformation in health and medical care as "health 4.0," highlighting the importance of adapting existing practice and governance structures to meet the challenges posed by digital health, such as how data should be stored and by whom, who can benefit from digital health and who is at risk of exclusion, and which types of informed consent should be used.

In light of this change in the cultural environment, it is crucial to carefully analyze the opportunities and obstacles from an ethical standpoint in order to build and formulate a sound and fair strategy for digital health. Yet, literature that outline the ethics of digital health remain rare, particularly on the justice component, which has been defined as the basic value of public health. Concerning balancing the advantages and risks of public health treatments, justice is mainly linked to and addresses "issues of responsibilities and obligations" (Brall et al., 2019).

In a systematic review examining the ethical considerations of eHealth, Jokinen et al. (2020) defined justice as ensuring equal access to comparable services for all individuals. Their definition was grounded in principles of equality and equity. Similarly, Daniels asserts that justice entails a societal duty to support and improve health outcomes to enable individual autonomy and opportunities. He emphasizes that equitable access to public health and healthcare is essential for achieving fair opportunities and health equity in society (Brall et al., 2019).

In the same vein, the International Society for Equity in Health (ISEqH) defines health equity as the absence of discrimination or unfair health disparities, whereas the World Health

Organization (WHO) defines it as the minimization of health disparities between groups of individuals with varying degrees of underlying social advantage. Consequently, health equity can be defined as the equitable distribution of health resources and results among diverse social groups, irrespective of socioeconomic status. In actuality, health equity refers to social justice in health. Achieving health equity does not require an equal distribution of resources; rather, it indicates that various groups of individuals in a society achieve equivalent health outcomes. In other words, equity is an ethical concept founded on the principle of justice, the fulfillment of which can ensure that the resources allocated to each individual fulfill his or her minimum health needs(Moghaddasi et al., 2017). In the British Computer Society (BCS) and the International Medical Informatics Association (IMIA), justice was the third major principle of the general ethics code(Samuel et al., 2010).

Despite the benefits of the communications revolution, a common criticism in eHealth intervention research is that rather than reducing the gap between the rich and the poor, the introduction of digital devices reproduces and reinforces existing social structures of health disparities. In the United States, Black and Hispanic individuals were significantly less likely than White and non-Hispanic individuals to be offered access to web-based personal health information portals by their healthcare providers, and they were also less likely to utilize personal health information when granted access (Lee et al., 2022).

On the other hand, Heinsch et al. (2022) utilized Fraser's multidimensional definition of social justice to determine the main aspects and patterns of distribution, recognition, and representation in the deployment of digital health services. Fraser has demonstrated that social justice depends not only on the distribution of services but also on society's recognition and representation patterns. A person can be systemically and significantly disadvantaged if their identity is not acknowledged or valued or if they have no real opportunity to have their voice expressed in the social structures and cultures in which they live. Their findings indicate that eHealth can improve client recognition, allowing them to participate as full or equal partners in healthcare interactions. Also, eHealth can improve healthcare distribution.

In addition, eHealth has the potential to eliminate health inequalities, leading to the establishment of health justice, such as equal treatment and equal access (Gerli et al., 2021; Moghaddasi et al., 2017); however, governments and health policymakers must provide measures to reduce significant barriers faced by society members, particularly the elderly, poor, uneducated, and disabled. This can lead to realizing eHealth's benefits for achieving health justice (Moghaddasi et al., 2017). From this perspective, the study hypothesizes that *H11: Justice provided by the eHealth system will positively affect ethical public value.*

2.9.2.6. Privacy Concern

In the work of both theorists and practitioners, the terms “privacy” and “personal data” are employed, transmitted, and defined in a vague manner (J. Tang et al., 2022). Privacy is not a precisely defined term, as it is subject to numerous culturally-dependent aspects (Sahama et al., 2013). The General Data Protection Regulation of the European Union (GDPR), for instance, defines "personal data" as data that either directly or indirectly relates to an identifiable or known natural person. The Article 29 Working Group has released guidelines on how to interpret the four basic elements of GDPR's test: "any information," "related to," "an identified or identifiable natural person," and "natural person." Information should be broadly understood to encompass both objective data (such as a person's identity or the presence of a certain drug in their blood) and subjective evaluation such as information, opinions, and evaluations(Finck & Pallas, 2020). Comparable to the EU's General Data Protection Regulation (GDPR), Jordan's Data Privacy and Protection Bill, 2020, contains numerous provisions identical to those in the GDPR (Alkhasawneh, 2020). The US legal system, in contrast, places a larger focus on data privacy. The terms "privacy" and "personal information" are often used

interchangeably in privacy decision-making studies, which focus on users' attitudes and willingness to expose or share their personal information.(J. Tang et al., 2022).

The meaning of privacy in academic work varies based on the domain being studied (ibid). For example, in the eHealth field, health privacy refers to safeguarding the confidentiality and security of patient records, including the privacy of conversations between healthcare providers and the security of medical records (Chen, 2020). According to Jacquinet & Curado (2016), privacy is a patient's inherent right to human dignity, encompassing intimacy, a private life, and patient respect. Hence, patients have the right to informational self-determination, meaning they can determine and control the use of their data. EHealth privacy concerns two key concepts: decisional autonomy and information protection. Autonomy is violated when personal information is accessed without patient consent, while information protection is compromised through breaches or illegal access that expose thousands of records (Karajeh & Mrayyan, 2020). The rise of advanced technical capabilities, particularly in eHealth, has expanded data collection, reuse, and connection of patients' data. Although sharing patient data for health research is increasingly seen as an ethical and scientific necessity (Filkins et al., 2016; Mostert et al., 2018), privacy concerns remain crucial (Riahi Sfar et al., 2022).

Ethical issues, such as privacy concerns, can jeopardize the rights of individuals and organizations (Jokinen et al., 2021). Moreover, privacy concerns are a key barrier to the widespread use of eHealth technologies. Patients who were more concerned about their privacy were less inclined to use eHealth technologies, even with their physician's recommendation. In order to achieve widespread patient adoption of eHealth, the scholars argue that eHealth developers and policymakers should prioritize privacy in the design and deployment of eHealth systems (Abouzid et al., 2022; J. Anderson, 2007; Kip et al., 2018; Ozair et al., 2015). However, privacy concerns in eHealth are not only an obstacle to adoption, but they also present "ethical dilemmas". As highlighted by Ozair et al. (2015), there are four significant ethical concerns regarding eHealth technology, the first of which is privacy. Many studies have demonstrated that patients and healthcare practitioners are concerned about the possibility of a breach of personal health information in eHealth systems (Kostkova, 2015; Seh et al., 2020). In addition, eHealth systems usually entail the collection and utilization of sensitive health data, which may pose ethical problems regarding the privacy of patients. (Tertulino et al., 2023).

To overcome these issues, several scholars considered privacy concern a multidimensional construct, as evidenced by models such as Smith et al.'s CFIP model, Malhotra et al.'s IUIPC model, and Xu et al.'s MUIPC model, which all examined the construct of privacy concern from multiple sub-dimensions. While privacy concern is incorporated into each model as a unidimensional variable in the classic privacy research literature, such as that of Dinev and Hart and Xu et al., in order to investigate the relationship between privacy concern and other variables (J. Tang et al., 2022). The current study follows Khan et al., 2019; J. Tang et al., 2022 in considering privacy concern as a unidimensional factor, which refers to the potential damage to privacy caused by patients' consent to provide personal information to eHealth providers.

In sum up, eHealth is a component of a more extensive change that is occurring within the healthcare industry, and this change will unavoidably have an effect on the position of ethics within the context of health care (Wadhwa & Wright, 2013). When information technologies such as eHealth are deployed, the individual's right to privacy is a concept that is regularly and increasingly emphasized because of the significance it holds from an ethical point of view(Brey, 2007). The following hypothesis was thus put forth:*H12: patients' privacy concerns have an effect on ethical public value when use Hakeem app.*

2.9.3. Hypotheses Related to Ehealth's Use & Adoption (Responses)

As clarified in the patients' core values section, patients' values are derived from their individual needs. When individuals experience needs and actively strive to achieve goals that

fulfill those needs, they develop mental representations of their experiences that play a crucial role in motivating their behavior (Jayadi et al., 2022). Furthermore, values play a pivotal role in motivating human behavior (Fischer, 2017). In accordance with the Stimulus-Organism-Response (S-O-R) framework, the organism in this context refers to the patients' public value, while the outcomes or responses of patients' motivations to utilize eHealth encompass implementation intention, habit, and eHealth use.

2.9.3.1. Linking Patients' Public Value to Use Behavior

Gaining insight into the roots of human behavior and comprehending the underlying reasons behind individuals' actions calls for an examination of their values (Page, 2022). Thus, values play a significant role not only within the field of sociology but also in other disciplines such as economics, psychology, neuroscience, anthropology, information science, and other related fields (Cheng & Fleischmann, 2010; Fellows, 2018; Kheirandish et al., 2020; Schwartz, 2012; Zacharopoulos et al., 2016). Further, Values play a crucial role in characterizing cultural groups, societies, and individuals, as well as in tracking temporal transformations and clarifying the underlying motivations driving human behavior (Schwartz, 2012). According to Brosch & Sander (2013), the concept of Values can be defined as internal standards that are closely linked with the self-schema and possess the motivational capacity to direct behavior.

Schwartz argues that values can be characterized as beliefs, representing desirable, abstract goals, which in turn serve as guiding standards that motivate individuals to engage in certain behaviors and assess their actions, as well as the actions of others and various events. Values are considered trans-situational, meaning that they hold importance across various contexts. In his work, Schwartz not only characterizes values as abstract objectives, but also evaluates the manifestation of values in behavior. He argues that values have an impact on our actions when they are relevant in the given context and hold significance for the individual involved. At first glance, these two claims may appear inconsistent. One claim suggests that values are trans-situational and abstract goals, while the other claim states that values are only activated when they are relevant in a specific context. However, the apparent inconsistency can be resolved if we differentiate between value traits and value states (Skimina et al., 2019).

The most straightforward way to distinguish between value traits and value states is that value traits refer to the enduring and consistent aspects of an individual's value system. They represent a person's general priorities and are relatively consistent across a variety of situations and contexts. These characteristics reflect the fundamental values and beliefs that influence an individual's outlook on life and guide their behavior and decisions over time. Conversely, value states are concerned with what is essential to a person at a particular time and within a specific context or situation. These value states are varied and may be affected by external factors or contextual cues. They are more transient and subject to change based on a person's immediate circumstances, emotions, or social influences (Skimina et al., 2018, 2019).

Further evidence came from the field of Neuroscience, which lends support to the idea that values play a pivotal role in motivating human behavior. Significant advancements have been made in the field of neuroscience, which have greatly contributed to our understanding of the processes involved in the planning, execution, and evaluation of human behavior within a variety of different brain networks(Fischer, 2017). The utilization of neuroimaging techniques, such as functional magnetic resonance imaging (fMRI) and positron emission tomography (PET), has provided evidence indicating that various regions of the brain become active during the process of value-based decisions (Cao & Reimann, 2020; Xue et al., 2010). For example, the ventromedial prefrontal cortex (vmPFC) and the ventral striatum collectively form the ventral cortico-striatal loop. This neural circuit has been extensively associated with approach and reward-seeking behaviors. It plays a crucial role in evaluating the subjective value of stimuli, detecting the presence or anticipation of rewards, and encoding errors and outcomes

related to predictive processes (Helion et al., 2019; H. Kim, 2022).Furthermore, it is worth noting that other brain regions, such as the ventral tegmental area (VTA), play an important role in a number of processes of reward cognition, such as motivational salience, associative learning, and positively-valenced emotion (Caminero & Cascella, 2022; Gupta, 2019).

Conversely, areas like the right anterior insula cortix (AIC) and Amygdala are involved in processing negative emotional states and feelings of fear, and their activation may be linked to behavior that goes against patients' deeply held values, like ethical values (Fortier et al., 2023; X. Gu et al., 2013; Šimić et al., 2021). Neurobiological studies have also clarified the role of neurotransmitters and neuromodulators in the shaping of behavior in accordance with individual values. One example is the neurotransmitter dopamine, which is recognized for its significant role in the brain's reward system. Its release is closely linked to the sensation of pleasure and the drive for motivation. The involvement of dopaminergic pathways has been identified in the reinforcement of behavior that is in line with an individual's values, thus promoting the adoption of actions that are consistent with those values (B. A. Anderson et al., 2016; Bromberg-Martin et al., 2010; Duerler et al., 2022; Peters et al., 2021).

Moreover, there is a consistent body of research indicating a direct relationship between values and behaviors that are thought to align with one's motivational values (Fischer, 2017). Thus, Values are considered to be motivational constructs and are defined as decontextualized and contextualized (see value traits and value states) life goals that guide perception, judgment, and behavior. Moreover, Motivational values are closely tied to an individual's basic needs, which are fundamental psychological requirements that drive human behavior. Basic needs, such as the need for trust, hedonistic, utilitarian, ethical needs, and social need, shape an individual's motivational values. These values serve as guiding principles and priorities in decision-making and behavior regulation. When individuals are motivated to satisfy their basic needs, they are more likely to engage in behaviors that are congruent with their values, such as patients adopt eHealth apps (Levontin & Bardi, 2019; Meynhardt & Jasinenko, 2021; Skimina et al., 2021).

In line with this, patients are more inclined to adopt and utilize eHealth apps when their motivational values are congruent with the functionalities and benefits provided by these digital health technologies (Yuen et al., 2023). Patients who assign more importance to trust in the eHealth system, value both the hedonistic and utilitarian aspects of utilizing the app, prioritize ethical considerations, and acknowledge the social advantages of using eHealth apps are anticipated to exhibit a heightened inclination towards adopting and maintaining usage of the MyHakeem app. As a result, patients' values play a significant role in guiding their behaviors and choices related to eHealth technology adoption and utilization (Cruz-Martínez et al., 2021; D. Gu et al., 2021; Y. K. Lee et al., 2013).

The present hypothesis suggests an unambiguous relationship between the patients' public value (which is reflective in five categories: hedonistic motivation, utilitarian motivation, trust value, social value, and ethical value) and their utilization of eHealth technology, emphasizing the significant influence of motivational values on the decision-making process of adopting digital health among patients within the healthcare system of Jordan. Thus, *H13: states that patients' public value has a direct effect on their adoption and usage of the MyHakeem app.*

2.9.3.2. Mediator Role of Implementation Intention

Meynhardt posited that "Value" pertains to what is desirable and preferred. Its subjective nature makes it dependent on individuals. However, when specific value experiences are widely shared, "value" takes on an objective quality in that particular sense. Values are only relevant to actions if they are translated into psychological states during the evaluation process, such as motivation, attitude, or opinion. Basic human needs refer to subjective comparisons

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between actual and desired or preferred states, providing a foundation for evaluations (Meynhardt, 2010).

Individuals also have stable value hierarchies that reflect their primary motivations. Their values influence how they interpret information and their concerns, attitudes, judgments, and behaviors. People act on their values because they want to feel consistent in their beliefs and actions and because value-expressive behavior allows them to achieve their goals and aspirations. As a result, people who feel consistent in their values and behavior have higher levels of self-fulfillment, well-being, and self-esteem. Values impact behavior in all aspects of life (Cieciuch, 2017). In a subsequent step, Caamaño-Alegre & Caamaño-Alegre (2019) added the intention element to the value-behavior relation and argued that it is critical to recognize that both representations and values influence intentions. The intention of an agent to accomplish something is derived from his or her representation of that thing as well as the value that the agent attaches to it. This relation in psychology is well established (Börstler et al., 2023). However, what does intention mean at all?

Behavioral intention is a psychological construct that refers to the directives that people give themselves about how they should act in a specific way. It encompasses both the direction and intensity of a decision, which can be inferred from responses such as "I intend to do X." The intention construct lies at the core of theories of attitude-behavior relations and models of health-related behavior (Sheeran, 2005). Since the 1980s, research in the field of information systems has focused on individual behavior and behavioral intentions in relation to information technology. This has led to the creation of several information technology acceptance models, such as TRA, TAM, UTAUT, and UTAUT2 (Pan & Gao, 2021).

For instance, the Theory of Reasoned Action (TRA) contends that a person's intention to engage in a behavior, which is a result of their attitude and subjective norms, influences the behavior they actually engage in. thus Intention is the best predictor of behavior (Silverman et al., 2016). In the technology acceptance literature, behavioral intention to use has been shown to be a good predictor of actual system use in both subjective and objective measurements (Börstler et al., 2023; Mardiana et al., 2015). However, there are inherent limitations to acceptance models that must be considered when investigating the factors that promote increased use of information and communication technologies (ICT), including eHealth apps. One of these limitations is the intention-behavior gap, in which individuals fail to act on their positive intentions (Schüz et al., 2017).

Wu & Du (2012) found that behavioral intention (BI) is more strongly connected with factors preceding usage than with usage itself. Among the three types of usage constructs, assessed usage is the most highly correlated with BI, while actual usage is the least highly correlated. Furthermore, intentions account for only 28% of the variance in future behaviors on average (Sheeran, 2005). thus, this gap is now widely acknowledged in social and health psychological research (Papies et al., 2022). Therefore, a second step beyond strong motivation is required to bridge the gap between intention and behavior to promote the adoption of eHealth technology (Schüz et al., 2017). To address this issue, Gollwitzer pointed out that goal achievement is supported by a second act of willing (volitional step) that provides the goal intention with an if–then plan indicating when, where, and how the individual will initiate responses that enhance goal realization. These plans are referred to as implementation intentions(P. Gollwitzer & Sheeran, 2006). Implementation intentions have been shown in studies to be effective in supporting behavior change in a variety of domains, including physical activity, healthy eating, and medication adherence (P. Gollwitzer & Sheeran, 2006; Lentferink et al., 2023). In the area of eHealth, implementation intentions have been found to promote the usage of online self-help programs and increase engagement in eHealth interventions (Elfeddali et al., 2013; Lentferink et al., 2023; Ort & Fahr, 2022).

Overall, implementation intention has been extensively utilized in psychology to assist individuals in initiating, pursuing, and achieving their target behavior (Chen & Chen, 2022). Additionally, studies demonstrate that implementation intentions have moderate to large effects on health behaviors (Prestwich & Kellar, 2014). Including implementation intention into the acceptance model can promote patients' adoption of eHealth. Thus, the following hypothesis has been proposed: *H14 The impact of patients' public value on Hakeem app use is mediated by patients' implementation intention.*

2.9.3.3. Mediator Role of Habit

Habits play a crucial role in shaping our behavior. While the term "habit" often refers to a repetitive or customary action, health psychology defines it as a phenomenon where behavior is triggered automatically by situational cues due to previously learned associations between the cue and behavior. Habits are formed by repeating behaviors in a given situation. Gardner defined habit as *a process by which a stimulus automatically generates an impulse towards action, based on learned stimulus-response association* (Gardner, 2015). Habits are also unresponsive to fluctuations in goals, motivation, and reward presence. Once established, cues will trigger behavior regardless of the current motivational state, despite the fact that habits may be formed during deliberate goal pursuit and continue to serve goals (Verplanken & Orbell, 2019). Similarly, habitual behaviors are evoked when a familiar setting triggers cue-behavior linkages learned from past performances. A central assumption of habit theory is that, by virtue of its automaticity, habit reduces the effect of intention on behavior, such that, under facilitating conditions, behavior will be led more by habit than by momentary intentions. This has resulted in suggestions that habit development be utilized as a means of sustaining positive behavior over time(Gardner et al., 2020).

In their research, Danner et al. (2008) uncovered two studies demonstrating the interplay of habit and intention about past behavior frequency and context stability. These studies revealed that intentions guide future actions when habits are weak, characterized by low frequency or unstable context, but not when habits are strong, marked by high frequency and stable context. Gardner (2015) corroborated these findings, citing empirical evidence of moderate-to-strong habit-behavior correlations. In health and eHealth, the habit can be viewed as:

> A neurologic pattern initially established through repetition, then initiated by a cue, resulting in automatic responses (automaticity) that are then manifested and acted upon through conscious recognition of the health impact of the response (Opalinski et al., 2018, p.54).

According to the definition, there are three antecedents to creating a healthy habit:

1. A constant context in which a cue is received.
2. Repetition of encountering a cue and acting on it.
3. A period of learning stimulus-response links between the cue and action.

The outcome of a health habit affects both health (Opalinski et al., 2018) and eHealth use (Benítez-Andrades et al., 2020). In the adoption and use of technology study, particularly UTAUT2, Venkatesh et al. (2012) have questioned the importance of behavioral intention as the most critical predictor of technology usage and established a new theoretical construct (i.e., habit) as an additional significant predictor of technology use. Adding habit to UTAUT will complement the theory's emphasis on intentionality as the overarching mechanism and primary driver of behavior. According to their research, habit directly and indirectly affects technology use (Venkatesh et al., 2012). Moreover, Tamilmani et al. (2018) conducted a literature review of UTAUT2-based empirical studies, and they concluded that researchers studying the early

stages of technology adoption in mandatory user settings should avoid using habit construct. Conversely, habit construction is encouraged in research that focuses on established technologies driven by consumer intrinsic motivation.

Finally, because the use of technology (such as mHealth and eHealth portals and devices) is so common, patients may become used to eHealth services and incorporate these technologies into their daily routines. When a behavior becomes a habit, it occurs automatically and without conscious thought (Ashraf et al., 2021). In light of the preceding discussion, the following hypothesis has been proposed*: H15: The impact of patients' public value on eHealth use is mediated by patients' habits of using eHealth apps.*

2.9.3.4. Controls Variables

Consistent with prior studies, study accounted for two controls variables: gender, and age (Ashraf et al., 2021; Faqih & Jaradat, 2015; Hong & Zhou, 2018; Venkatesh et al., 2012; Venkatesh, Sykes, et al., 2011). EHealth is an opportunity for many patients who can benefit from eHealth solutions; however, the potential adopter and user communities are diverse in terms of attitudes, needs, desires, and technical skills. For example, people's cognitive and affective personal characteristics change with age and, in particular, gender, and these shifts are decisive factors for technology adoption and acceptance (Wilkowska & Ziefle, 2012). further, socio-economic factors within societies seem to be a barrier to widespread eHealth adoption (Hage et al., 2013). In terms of age and gender, eHealth adoption was highly correlated with younger ages (Hong & Zhou, 2018). Additionally, ALsharif (2022) did a study to evaluate the attitudes of chronic disease patients toward eHealth apps in the post-COVID era. His research included all Saudi Arabians over the age of 18 who used eHealth services. Male and female participants, as well as younger and older participants, showed considerably different perspectives on the future adoption of eHealth apps. Participants who were male and younger were less likely to utilize the eHealth application than participants who were female and older. Similarly, research undertaken in Bangladesh and Australia to investigate factors influencing the adoption of the eHealth system revealed that gender played a key role and that women were more interested than males about investigating and experimenting with new technologies (Alanezi, 2021). Faqih and Jaradat (2015) studied adoption among Jordanian patients within the context of mobile health. According to their findings, perceived ease of use, perceived usefulness, social impact, trust, and security/privacy all influence patients' perceptions of adopting mobile healthcare technologies. In addition, the present study reveals that demographic characteristics, such as age and gender, exert a substantial moderating effect on the adoption of mobile technology in Jordan's healthcare systems.

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3. MATERIAL AND METHODS

The primary objective of this chapter is to provide an overview and rationale for the research approach employed. The preceding section developed a conceptual framework to elucidate the factors that impact eHealth adoption in Jordan. The present section delves into multiple research strategies to ascertain the most effective methodology for validating this study's conceptual model.

3.1. MODEL OF DESIGNING RESEARCH METHODOLOGY

Many individuals organize their research based on a question or problem that must be answered or solved (in the current study, based on the patients' value model, what factors influence eHealth technology adoption in the Jordan healthcare system?) They then consider the data they need as well as the methods they will use to collect it (M. Saunders et al., 2019). For the preceding procedure to be organized, a scientific approach is required.

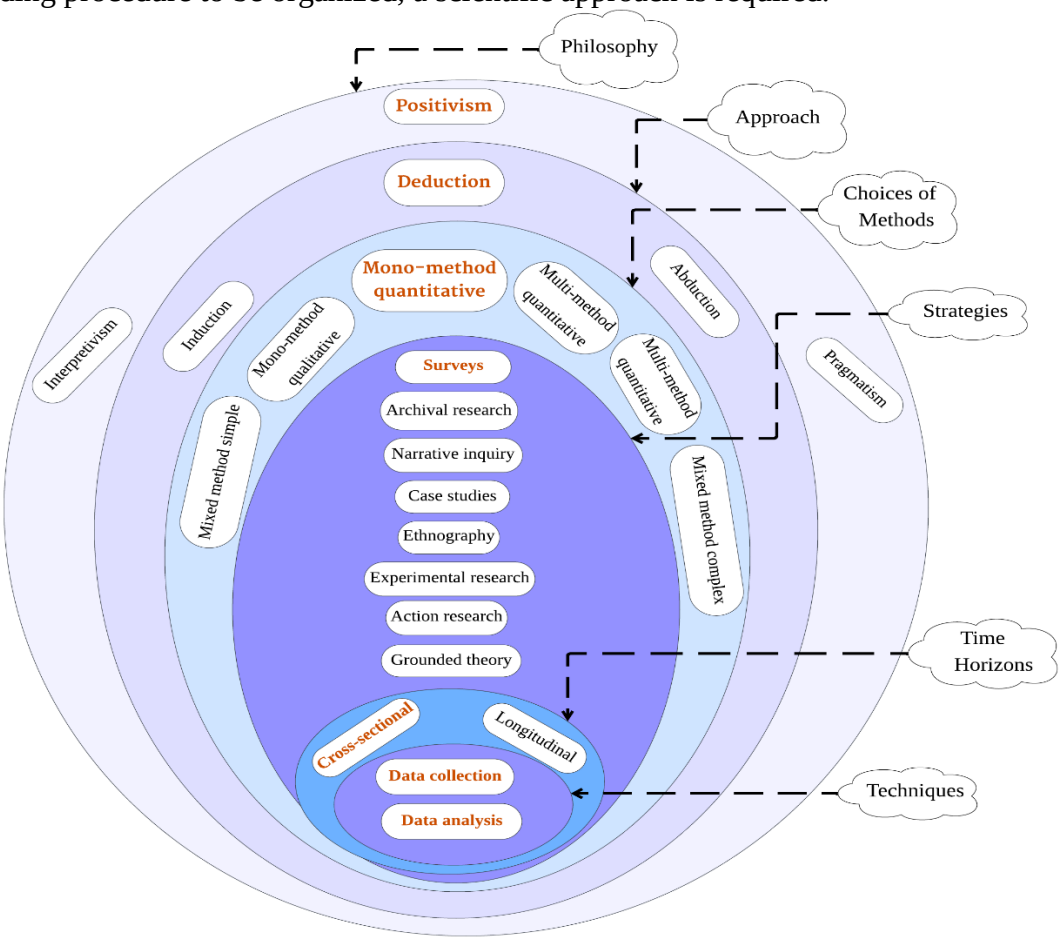

Figure 27. The research onion.
Source: Own elaboration adapted from Saunders et al. (2012).

At its core, a methodology is a comprehensive research plan that provides a framework for conducting research. It encompasses a set of core beliefs and philosophical principles that

shape how researchers approach their work and guide the selection of appropriate research methodologies. In a dissertation or thesis context, research methodology is a critical element, ensuring that the chosen tools, approaches, and underlying philosophy work in harmony to achieve the desired outcomes (Melnikovas, 2018).

In the realm of research, there are many methods and frameworks to choose from, each with its strengths and weaknesses. One of the most comprehensive and widely utilized frameworks is "the research onion" (Alturki, 2021), first proposed by Saunders and colleagues (refer to Figure 27). This framework has gained significant influence as it visualizes the various stages of research as layers of an onion, each representing a crucial step in the investigative process, ranging from broad to specific phases. By following this progressive approach, researchers can effectively gather and analyze data, which is the innermost layer. This metaphor and its accompanying content apply to many types of research, making it highly relevant (Iovino & Tsitsianis, 2020). Additionally, the research onion framework can help researchers achieve greater consistency in their studies and inform significant changes in socio-technical systems (Zolfagharian et al., 2019).

According to Melnikovas (2018), any research methodology follows a structured process. It involves defining the basic philosophy, selecting approaches, methods, and strategies, and establishing time horizons. These elements guide the research logic towards the research design, consisting of primary data collection and analysis techniques and procedures. (Saunders et al., 2019, 2012) further categorized the research process into three interconnected levels, with the first two levels focused on philosophy and theory development, followed by research design encompassing methodological choice, strategy, and time horizon. Finally, the third level involves techniques and procedures, which include data collection and analysis.

The present study adhered to the "research onion" framework developed by Saunders et al. (2012, 2019) to establish a practical and enduring approach. The study was grounded on an epistemological premise that relied on positivism as the research philosophy and deduction as the methodology to evaluate a conceptual model through empirical data (refer to Figure 27). A detailed explanation of the study's methodology will be provided in the following sections.

3.2. Research Philosophy and Approach

The research philosophy is regarded as the most essential aspect of the research investigation, as well as the defining characteristic of the research project as a whole. Adopting an appropriate philosophy is the first phase of the research methodology and, arguably, the first step that will set the tone for the succeeding steps(Iovino & Tsitsianis, 2020). The philosophy of scientific research is a framework of the researcher's ideas that guides the acquisition of trustworthy, novel knowledge about the subject of inquiry. Put simply, it constitutes the basis of the research endeavor, encompassing identifying an appropriate research approach, articulating a research question, and collecting, synthesizing, and evaluating data (Žukauskas et al., 2018).

The philosophy or paradigm of a study is an essential aspect of conducting research and achieving meaningful results (Guba & Lincoln, 1994). It encompasses the study's assumptions, knowledge, and nature and is concerned with a specific approach to acquiring knowledge.

Understanding this issue is crucial because researchers may hold different beliefs about the nature of truth and knowledge, and paradigms can help us comprehend their views (Dudovskiy, 2018; C. Wagner et al., 2012). A paradigm describes a worldview informed by philosophical assumptions about social reality, also known as ontology - what we believe about the nature of reality. Epistemology, the ways of knowing - how we know what we know, and axiology, ethics, and value systems - what we believe is true, are also significant components of a paradigm.

Thus, a paradigm encourages us to ask specific questions and employ systematic investigation methods, known as methodology, such as how we should investigate the universe

(C. Wagner et al., 2012). Consequently, there are three primary ways to consider research philosophical assumptions: epistemology, ontology, and axiology. Each has significant differences that will impact how researchers approach the research procedure (Saunders et al., 2012).

The term "Epistemology" is the study of how we know what we know (our "assumptions about knowledge"), what kind of knowledge is acceptable, valid, and legitimate, and how we can share our knowledge with others (Saunders et al., 2019). Al-Ababneh (2020) also argues that epistemology provides a conceptual foundation for what kinds of knowledge are possible and how we may ensure that they are appropriate and acceptable. The field of epistemology is concerned with the nature, origin, and scope of knowledge.

Therefore, it investigates the defining components, the sources, and the limits of knowledge. Given the essential significance of epistemology in the history and contemporary practice of philosophy, epistemologists will always have work to do. Only discussions regarding the analysis of knowledge, the sources of knowledge, and the status of skepticism will keep epistemology lively and fruitful(Moser, 2005).

Ontology, on the other hand, is described as the study that is undertaken to establish discoveries regarding the nature of the world. Richards describes ontology as our assumptions about the kind and nature of reality that exists(Denton, 2020). Historically, ontology has been concerned with what exists, the nature of the world, and reality(Vasilopoulos, 2021). Despite some consensus on the concept of ontology, there is no single way to interpret the social world. This is due to the fact that each group of researchers has a unique ontological worldview. This variation is related to the impression of how things differ from one individual to the next and from one situation to the next. To determine the ontological stance of a research, consider the nature of the phenomenon, entity, or social reality under consideration(Aldawod & Day, 2017).

Many researchers argue that ontology and epistemology issues cannot be resolved philosophically, despite the sometimes-heated argument between critics of both schools. Connell and Nord ask: (1) If reality is external and unknown to humans, how do we learn about it? (2) How do we know we're learning it? We cannot determine the existence or nature of reality; hence any philosophical dispute is pointless. Hughes and Sharrock agree that there are no rules for an adequate philosophical viewpoint. Of course, the nature of philosophy and its relationship to other types of knowledge is a fundamental philosophical issue, thus we cannot definitively state the relationship between philosophy and social science (Holden & Lynch, 2004).

The third and last assumption of research philosophy was axiology, which refers to the role of ethics and values in the process of research (Saunders et al., 2012). As a researcher, you must determine whether to accept your own opinions and beliefs as positive effects on your research. Therefore, you must determine how to achieve a balance between your values and those of your subjects. As Heron explains, our values are the basis for all human actions; therefore, it is essential that you actively notice and reflect on them in your research. Selecting one issue means that you place greater importance on it. Your data collection and research methods reflect your values. If you appreciate face-to-face interviews or ethnography as research methods, you may value them more than anonymous survey responses (Saunders et al., 2019).

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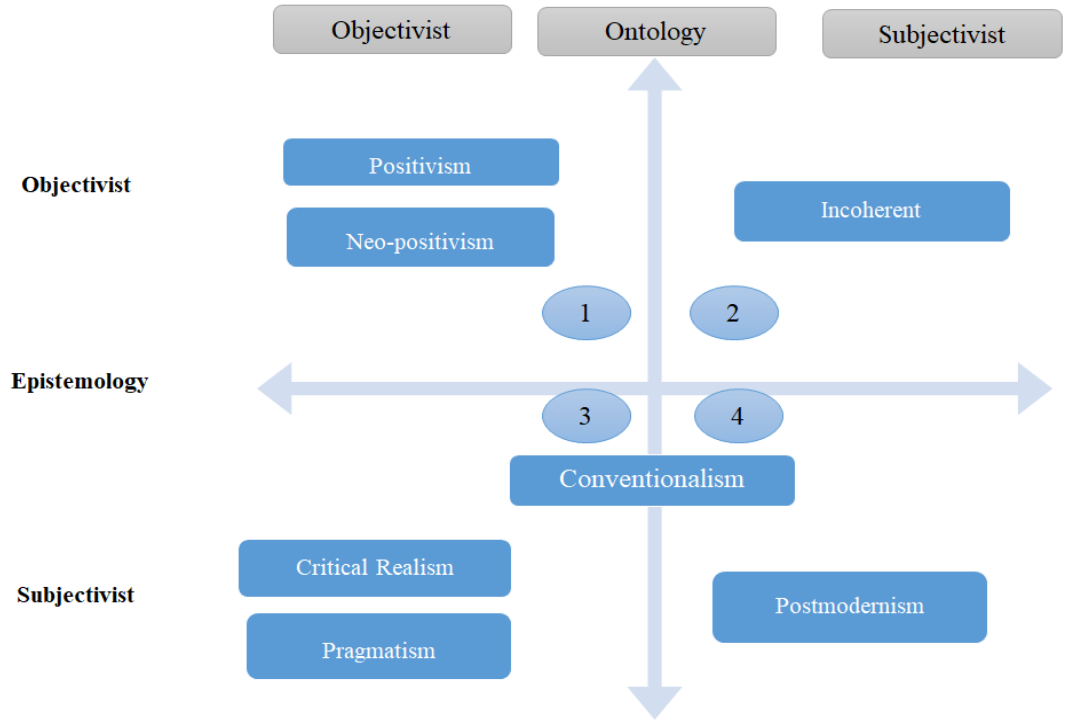

Figure 28. Reflexivity and management research philosophies.
Source: Own elaboration adapted from Wong Kee Mun et al. (2011).

Regarding the development of the present research philosophy and the design of the current study, it is crucial to note that philosophical differences are inherent to business and management research due to the fact that it draws its theoretical base from a mixture of disciplines (social sciences, natural sciences, applied sciences, and the humanities). Incorporating these disciplines resulted in the coexistence of numerous research philosophies and approaches (Saunders et al., 2019).

Although this allows for philosophical and methodological diversity, it also disperses business and management research perspectives along a multidimensional set of continuums between two conflicting extremes “objectivism and subjectivism” (M. Saunders et al., 2012). The ability of the researcher in epistemic reflexivity, "which is the extent to which the phenomena of research are shaped and framed by the disciplinary presuppositions and methodological prescriptions that are brought to bear (Whitaker & Atkinson, 2021)," influences the forms and outcomes of research, though levels of reflexivity vary across paradigms (see Figure 28.) In general, objective epistemology is dependent on objective ontology. Consequently, a person who views the realities of the research in an objective manner and recognizes that they cannot exist independently, as demonstrated by the incoherent area 2 in Figure 28. (Wong Kee Mun et al., 2011).

There are five primary philosophies in business and management research philosophy: positivism, critical realism, interpretivism, postmodernism, and pragmatism (Saunders et al., 2019). Positivism, also known as positivist and postpositivist research, empirical science, and postpositivism (Creswell & Creswell, 2017), positivism holds the philosophy that only "factual" information acquired through observation (using the senses) and measurement are reliable (Dudovskiy, 2018). Positivism guarantees a precise and clear understanding of the world and denotes something claimed or given. It seeks to establish a complete social theory that uses the scientific method to study society and humans for their benefit. Positive science is grounded in a genuine experience and not conjecture, with knowledge-based firmly and entirely on hypotheses and not speculation. Positive science (or positivism) is characterized by what is hypothesized or provided by direct experience and what is seen using scientific

procedures. The relationship between contemporary positivism and empirical science remains strong (Al-Ababneh, 2020).

In addition, positivism proposes that the purpose of scientific research is to observe and measure phenomena in order to discover the objective truth about them. Consequently, the need for objectivity is embedded in the positivist epistemology of the scientific method(Lazard & McAvoy, 2020). Positivism typically accepts objectivism in both epistemological and ontological viewpoints (see the upper-left side of Figure 28), despite the fact that the latter are susceptible to subjective epistemic assumptions. This field implies the theory of neutral observational language by employing an objective approach to observing reality. Here, new knowledge is often derived deductively from existing knowledge, testing positivism's empirical data-based constructs.

In other words, this field of study relies on empiricism and rationalism to justify its knowledge claims. Due to the limits imposed by social constructions, positivism investigates cause-and-effect relationships under the assumption that everything else is constant(Wong Kee Mun et al., 2011). Positivist research also presupposes a priori concepts with established relationships that may be evaluated using standardized instruments. Through the use of quantifiable variables and the testing of hypotheses, theories are evaluated in an effort to better understand phenomena (Rashid et al., 2019).

Critical realism, in contrast, maintains that there is an independent reality beyond humans, and scientific theories play a crucial role in describing the deep structures of this world (Alvesson & Skoldberg, 2009). This perspective allows for authentic, real-world experiences while recognizing that our senses and world representations can be flawed and misleading (Dudovskiy, 2018, 2022).

According to critical realism, understanding the world involves two steps: experiencing sensations and events and then engaging in mental processing to reason backward from those experiences to the fundamental reality that may have produced them (Saunders et al., 2019). This reasoning process is essentially abductive, but critical realists often refer to it as "retroduction."

Bhaskar argues that comprehending social phenomena requires understanding the social structures that have given rise to them. As a result, most critical realism research focuses on in-depth historical analyses of social and organizational structures and their evolution (ibid).

Interpretivism has a rich heritage in anthropology, much like positivism. However, it is often called "anti-positivism" due to its differing perspective. Interpretivism asserts that truth and knowledge are subjective, influenced by cultural and historical context, and grounded in personal experiences and perceptions. Researchers are inherently shaped by their values and beliefs, which can impact how they collect, interpret, and analyze data ((Pasipamire & Masuku, 2022; G. Ryan, 2018). Interpretivism involves researchers interpreting study elements, which imbues studies with a human element.

Therefore, interpretive scholars maintain that access to reality (whether given or socially constructed) is constrained by social constructs such as language, consciousness, shared meanings, and instruments. The social sciences' critique of positivism has led to the development of interpretivism, which prioritizes qualitative analysis over quantitative analysis. Interpretivism is associated with the philosophical perspective of idealism. It encompasses various approaches, such as social constructivism, phenomenology, and hermeneutics, which reject the objectivist concept that meaning exists independently of consciousness. The interpretive approach emphasizes recognizing individual differences for researchers as social actors. Interpretivism research often focuses on the meaning and may employ various methods to explore different aspects of the issue (Dudovskiy, 2018).

From the postmodernist viewpoint, reality is deemed inaccessible and cannot be fully comprehended through language. As a result, science is considered a "language game" or a

"form of life." Postmodernism offers various interpretations of reality, emphasizing the importance of management research remaining modest in its claims about the social world's reality. Postmodernists construct knowledge based on their self-knowledge and reflexivity by making sense of sensuous relativity. Deconstructionism heavily influences much of their management research (Wong Kee Mun et al., 2011).

As a postmodernist researcher, your focus would be on the ongoing processes that constitute entities like "management," "performance," and "resources." You would challenge organizational theories by exposing the perspectives and realities they overlook or disregard and whose interests they serve. You would be willing to deconstruct any form of information, such as words, photographs, dialogues, voices, and numbers, and conduct thorough investigations of events like interpretivists (Saunders et al., 2019).

Postmodernist research acknowledges that power relations between the researcher and the study subjects affect the knowledge produced throughout the research process. Hence, it is essential for researchers to be candid about their ethical and moral stances and to engage in radical reflexivity in their thoughts and writing. However, postmodernism has been criticized for being impractical and never-ending, leading to many voices emerging, fading away, and resurfacing through endless complexities of self-reflection (Wong Kee Mun et al., 2011).

The philosophy of pragmatism, which has its roots in the works of Peirce, James, Mead, and Dewey, offers another perspective on worldviews. While there are several variations of this philosophy, for most people, pragmatism as a worldview is based on acts, situations, and outcomes rather than antecedent conditions, as in postpositivism. The focus is on finding practical solutions and solving problems rather than methodologies. Researchers prioritize the study problem and employ all possible approaches to understand it, rather than just one particular methodology, as in other worldviews (Creswell & Creswell, 2017). Pragmatist research starts with a problem and aims to find practical solutions to inform real-world practice. The reflexive process of inquiry, initiated by doubt and a sense of something being amiss and ends with belief when the problem is resolved, is driven by the researcher's values (Saunders et al., 2019).

Pragmatism is popular among mixed-methods researchers. Instead of making assumptions about knowledge, it solves "real world" problems. Russell questioned James and Dewey's early pragmatism, notably on the difficulty of establishing what "works."(Hall, 2013). Many contemporary philosophers reject pragmatism as a philosophy because it chooses not to engage in metatheoretical arguments as a solution to many philosophical conflicts. Instead, pragmatism pursues knowledge that will enable us to deal with pertinent problems. Pragmatism has also been accused of neglecting philosophy and theory in favor of practical outcomes (Nowell, 2015). Moreover, pragmatics has been attacked for placing the research question above the underlying methodology and paradigm.

Pragmatists reject classic dualist paradigms in favor of eclecticism and pluralism, where methodological choice is determined by the necessity to address a research issue and not by philosophical alignment (ibid.). To sum up prior research philosophies, Saunders et al. (2019) compared the five research philosophies in terms of ontology (the nature of reality), epistemology (accepted knowledge), axiology (the role of values in research), and data collection strategies, as illustrated in Table 6. Each paradigm (e.g., Positivism, Realism, etc.) has a unique axiology, ontology, epistemology, method, and rhetoric of research standpoint. For example, positivism, one of the older approaches to social research, is typically linked with quantitative methods and highly formal terminology that emphasizes precision, generalizability, reliability, and repeatability. Positivist researchers consider the research process as a set of logically related phases and base their knowledge claims on objectivity, standardization, deductive reasoning, and control(Kaushik & Walsh, 2019).

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Also, certain scientific methodologies may be associated with specific paradigms, such as a positivistic paradigm, which often implies a quantitative methodology. A qualitative methodology is often used in a constructivist or interpretative paradigm (Ponterotto, 2005).Furthermore, the positivist research paradigm assumes that reality can be characterized objectively and quantitatively (Collis & Hussey, 2013). Positivist studies are largely focused on putting theory to the test in order to improve predictive understanding of certain occurrences. To acquire and analyze data, the positivist paradigm employs quantitative, scientific, and experimentalist methodologies. Deductive large sampling and measurement are common methodologies for investigations that employ the positivist philosophy (Collis & Hussey, 2013;Saunders et al., 2016).

Based on the previous discussion of the positivist research paradigm and as shown in Table 6, it can be argued that the current study follows this paradigm because it is focused on factors that motivate patients' adoption of eHealth technology (especially the Hakeem program) in the Jordanian healthcare system according to the UTAUT model and PV theory. to see if elements of public value motivate Jordanian patients to use eHealth technology through the "Hakeem program." Positivism will be selected as the suitable paradigm for this study.

Positivism is used to investigate factors that motivate Jordanian patients' acceptance of eHealth technology and to assess the public value gained from their involvement with eHealth technology. Based on earlier literature on technology adoption and public value, the current study created a conceptual model consisting of 16 factors. The positivist method was chosen due to the nature of the problem and previous research in a similar area.

To summarize, this methodology involves creating hypotheses, models, or causal connections between constructs, and then utilizing quantitative methods to investigate these relationships (W. Chen & Hirschheim, 2004). This approach is favored due to its ability to test theoretical models, clarify the causal connections between constructs, and gather a broad range of quantitative data for analysis.

The current study employs the UTAUT model and public value theory, explained in detail in Chapter 2 of the research. When designing a research study, the degree to which it focuses on testing or constructing a theory is a crucial question. This is often viewed as two contrasting modes of reasoning: deductive and inductive (Saunders et al., 2019).

In the social sciences, induction and deduction research logic are commonly used (Rashid et al., 2019). When research focuses on developing theories and hypotheses and designing a strategy to test them, the deductive method should be employed. In contrast, the inductive method should be utilized when collecting data and constructing a hypothesis based on the results of data analysis (Al-Ababneh, 2020).

Clearly, current research is based on deduction. Research begins with a theory (PV theory and UTAUT), which is frequently derived from reading academic literature (chapter 2), and the author constructs a research plan to evaluate the hypotheses (chapter 3).

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Table 6. The comparison between five philosophical frameworks.

		RESEARCH PHILOSOPHY				
		Positivism	Critical realism	Interpretivism	Pragmatism	Postmodernism
PHILOSOPHICAL ASSUMPTIONS	Ontology (nature of reality or being)	Real, external, independent One true reality (universalism) Granular (things) Ordered	Stratified/layered (the empirical, the actual and the real) External, independent Intransient Objective structures Causal mechanisms	Complex, rich. Socially constructed through culture and language Multiple meanings, interpretations, realities Flux of processes, experiences, practices	Complex, rich, external 'Reality' is the practical consequences of ideas Flux of processes, experiences and practices	Nominal Complex, rich Socially constructed through power relations Some meanings, interpretations, realities are dominated and silenced by others Flux of processes, experiences, practices
	Epistemology (what constitutes acceptable knowledge)	Scientific method Observable and measurable facts Law-like generalization Numbers Causal explanation and prediction as contribution	Epistemological relativism Knowledge historically situated and transient. Facts are social constructions. Historical causal explanation as contribution	Theories and concepts too simplistic Focus on narratives, stories, perceptions and interpretations New understandings and worldviews as contribution	Practical meaning of knowledge in specific contexts 'True' theories and knowledge are those that enable successful action Focus on problems, practices and relevance Problem solving and informed future practice as contribution	What counts as 'truth' and 'knowledge' is decided by dominant ideologies Focus on absences, silences and oppressed/ repressed meanings, interpretations and voices Exposure of power relations and challenge of dominant views as contribution
	Axiology (role of values)	Value-free research Researcher is detached, neutral and independent of what is researched Researcher maintains objective stance	Value-laden research Researcher acknowledges bias by world views, cultural experience and upbringing. Researcher tries to minimize errors Researcher is objective	Value-bound research Researchers are part of what is researched, subjective Researcher interpretations key to contribution Researcher reflexive	Value-driven research. Research initiated and sustained by researcher's doubts and beliefs Researcher reflexive	Value-constituted research. Researcher and research embedded in power relations Some research narratives are repressed and silenced at the expense of others Researcher radically reflexive
	Typical methods	Typically deductive, highly structured, large samples, measurement, typically, quantitative methods of analysis, but a range of data can be analyzed	Reproductive, in-depth historically situated analysis of pre-existing structures and emerging agency Range of methods and data types to fit subject matter	Typically, inductive. Small samples, in-depth investigations, qualitative methods of analysis, but a range of data can be interpreted	Following research problem and research question. methods: mixed, qualitative, quantitative, action research Emphasis on practical solutions	Typically, deconstructive – reading texts and realities against themselves. In-depth investigations of anomalies, silences and absences Range of data types, Typically, qualitative analysis

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Source: Own elaboration adapted from Saunders et al. (2019).

3.3. RESEARCH DESIGN

The research purpose and questions are good places to start when making a research design because they give researchers important clues about what they want to test (Wahyuni, 2012). Research design is the general plan of how a researcher addresses the specified research issue (Saunders, 2012). Setting a precise aim drawn from the research problem, identifying the data sources, analyzing the data, and handling ethical concerns are all part of the plan (Saunders et al., 2016; Zikmund et al., 2013).

The current study's design involves three stages: defining the research purpose, developing a research strategy, and analyzing data. The researcher conducted a literature evaluation on eHealth adoption and public value to determine any gaps in the literature. The research aim was then identified to examine the factors that influence Jordanian patients' adoption of the eHealth initiative "MyHakeem" in light of PV theory and UTAUT. A conceptual model was created, and 14 hypotheses were proposed.

This study's research strategy is based on primary data collection through a questionnaire. Additionally, this study includes some secondary data related to eHealth technology, the number of citizens, and the number of Jordanian patients using eHealth. The second stage of this study involves data collection, during which a pilot study is conducted, and the reliability and validity of the questionnaire are verified. The researcher then adjusted the questionnaire accordingly and submitted the final one. The third and final stage of this research is analyzing and discussing the results using IBM SPSS and IBM AMOS. This approach enables the research to achieve the goals and objectives mentioned in the introduction. The steps of the research methodology are summarized in Figure 29.

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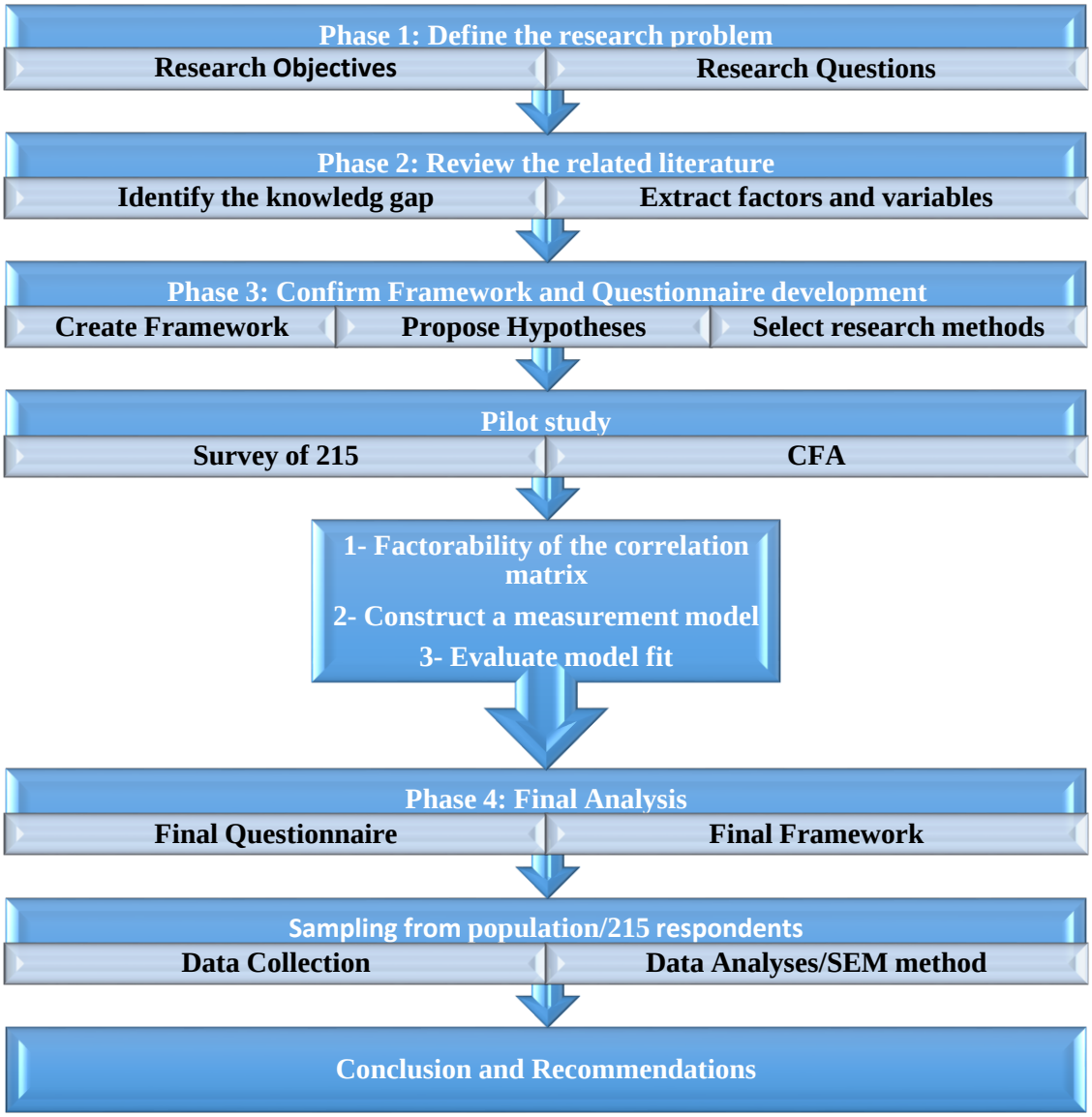

Figure 29. Thesis design.
Source: Author.

3.4. Research Methodology and Justifications

The study method is an investigation strategy that goes from basic assumptions to study design and data acquisition (Elock, 2010). Research methodology can also be viewed as a bridge that connects the philosophical standpoint with the research methods (Mayer, 2015). There are various ways to categorize research methods, but the two most prominent are qualitative and quantitative. Differences between qualitative and quantitative research can be traced back to the researcher's worldview and the study's overarching objectives (see Table 7) (Creswell & Creswell, 2017; Elock, 2010; Mayer, 2015). The terms also have a secondary meaning, referring to the processes involved in conducting research, including the techniques used to gather information and the conclusions and interpretations drawn from it (Elock, 2010).

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Table 7. Fundamental differences between quantitative and qualitative research.

	Quantitative	Qualitative
Principal orientation to the role of theory in relation to research	Deductive; testing theory	Inductive; generation of theory
Epistemological orientation	Natural science model, in particular positivism	Interpretivism
Ontological orientation	Objectivism	Constructivism

Source: Own elaboration adapted from Mayer (2015).

According to Flick, Dobrovolny, and Fuentes, quantitative research is a formal, objective, and systematic method for gathering information about the world through numerical data (Josephine, 2019). Quantitative research originates in natural science, which holds that knowledge of reality can only be achieved "through the researcher's eyes." It is primarily grounded in positivist beliefs and "embodies a view of social reality as an external objective reality" (Mayer, 2015). Despite its positivist roots, this research method can probe many aspects of social phenomena, including emotions and individual perspectives (Josephine, 2019). The quantitative approach is practical in situations involving many respondents, quantitative data measurement, and statistical analysis (May & Perry, 2022). Quantitative research also uses closed questions derived from established theories. These questions generate a problem definition that will remain the same during the study. The theory is tested in a deductive-empirical cycle (Mayer, 2015).

The qualitative approach, in contrast, is derived from the constructivist paradigm (Yaakob et al., 2019). *Qualitative research* is an inquiry that seeks to understand social phenomena in their natural context, focusing on the "why" rather than the "what." Its emphasis is on people's direct experiences as meaning-creating agents in their daily lives. Qualitative researchers use various methods to study human phenomena, including biography, case study, historical analysis, discourse analysis, ethnography, grounded theory, and phenomenology. Unlike logical and statistical procedures, these methods prioritize a comprehensive comprehension of the subject matter (Ahmad et al., 2019).

The researcher's epistemologically grounded beliefs determine whether quantitative or qualitative research methods will be employed (Graue, 2015). Moreover, the nature of a study has a significant impact on the selection of an appropriate research methodology (Srivastava & Thomson, 2009)

The current study uses a confirmatory approach to investigate the factors that influence eHealth adoption in Jordan. Sekaran and Bougie (2016) categorize research purposes into exploratory, descriptive, and confirmatory, with the latter involving hypothesis testing. This study falls under the confirmatory category as it seeks to test hypotheses drawn from the conceptual framework proposed, analyzing the use and acceptance of eHealth technology in Jordan. Confirmatory research typically utilizes a theoretical framework to guide the investigation, as emphasized by Christ (2009). Survey data is crucial in testing the theoretical framework to identify the criteria for evaluating eHealth technology use and adoption.

The study helps clarify the nature of specific interactions between variables, and hypothesis testing helps establish links between them. Therefore, a quantitative technique is necessary to achieve the study's confirmatory objectives. Quantitative research investigates the relationship between variables, putting objective theories to the test, as described by Creswell (2013).

Finally, there are several compelling reasons for utilizing a quantitative methodology in this study. Firstly, within the realm of management research, quantitative methods have proven to be both accurate and versatile (Zikmund, W; Babin, B.J.; Carr, J.C.; Griffin, 2020). Furthermore, this study is grounded in established theories related to the adoption of information systems and the creation of public value. As such, a quantitative positivist paradigm is an ideal approach for achieving the study's primary objectives, which include

identifying the key factors influencing eHealth adoption and assessing their impact on public value creation. Secondly, a quantitative approach is aligned with the principles of positivism, which emphasizes rigorous testing of theory in order to enhance our predictive understanding of specific phenomena (Creswell & Creswell, 2017; Saunders et al., 2016).

3.4.1. Data Collection Method

Once you have peeled away the methodological choice layer, you will find the next layer of the research onion: strategies. This layer highlights that researchers have the ability to utilize a variety of strategies within their research design to address and answer their research questions (Saunders & Tosey, 2012). A research strategy can be seen as a researcher's plan of action to achieve their goal. This involves the connection between their philosophy, their selection of data collection and analysis methods, and their plan for conducting the research (M. Saunders et al., 2012). The strategy may include a range of methods, such as experiments, surveys, archival research, case studies, action research, ethnography, ground theory, and narrative inquiry (ibid).

This research will employ a couple of practical methods. At first, the researcher reviewed the public value theory (PV) and UTAUT literature for clues as to the factors that influence eHealth adoption. Second, primary data was gathered via an online standardized questionnaire. Respondents fill out questionnaires by answering a series of questions. Statistical approaches are used to test hypotheses about the relationships between different variables to evaluate the outcomes.

3.4.2. Online Survey Research Justification

Saunders and his colleague (2012) outlined eight different research methods: experiment, survey, archival research, case studies, action research, ethnography, ground theory, and narrative inquiry. For a more detailed explanation of these methods, please refer to Table 8. It is important to note that the current study is based on quantitative research, which involves a systematic and empirical investigation of social phenomena using statistical, mathematical, or computational techniques. This type of research aims to construct and apply mathematical models, theories, and hypotheses relevant to the phenomenon being studied. In quantitative research, measurement is critical as it establishes a connection between empirical observation and the mathematical expression of quantitative relationships (Baptista & Negreiros, 2014).

Quantitative research projects frequently employ survey strategies to describe social phenomena (Bowling & Ebrahim, 2005; Brannen, 2017). Survey techniques are also commonly used to describe and investigate human behavior in social and psychological research (Ball, 2019), and adoption studies of eHealth technologies are no exception. Survey research aims to provide a quantitative or numerical description of trends, attitudes, or opinions by analyzing a population sample. It comprises cross-sectional studies that collect data using questionnaires to generalize from a sample to the population (Creswell & Creswell, 2017).

Surveys can be administered in various ways, including online surveys (Ball, 2019; Van Selm & Jankowski, 2006). Any online instrument that collects data is considered an online survey (Gordon & McNew, 2008). From the standpoint of the computer, a survey is any software that implements a form object, such as a text entry box, radio button, drop-down menu, checkboxes, or graphical hotspots, to gather data. There are three fundamental methods for gathering data online. The first is via e-mail, the second is via the Web, and the third is via personal digital assistants (PDAs) or handheld devices (Gordon & McNew, 2008). The current study will utilize web-based surveys for several reasons:

1. Automating sending and capturing survey questions and responses significantly reduces costs and errors associated with hiring researchers to ask face-to-face questions or input data (Ball, 2019).

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2. The survey can maintain anonymity by not disclosing the respondent's identity, which would require a court order to obtain, even though the respondent's IP address can be obtained (Gordon & McNew, 2008).
3. Web surveys allow for "skip" and "context" logic, automatically skipping questions based on previous responses. The study also includes a filter that asks participants if they are using the Hakeem program, and if they answer no, they are taken out of the questionnaire (Gordon & McNew, 2008).
4. Web surveys eliminate interviewer bias and the need for data entry when respondents enter data directly into an electronic file, making the process more convenient for respondents (Van Selm & Jankowski, 2006).

Table 8. Research strategies.

Method	Why is it inappropriate for current research?
Experimental research	A method used in psychology and education-based research in which a group of volunteers undergo an experience with varying environmental conditions in order to test a hypothesis that is frequently associated with a change in behavior (Camilleri et al., 2019). Thus, experimental research entails manipulating an independent variable and assessing the effect it has on a dependent variable. And this type of investigation can take the form of a laboratory-based artificial experiment (Silva, 2008).
Grounded Theory	Grounded theory can be viewed as both a research methodology and a set of tools for the development of theory via data analysis (Mayer, 2015). Current research utilizes and modifies existing theories.
Ethnography	When studying a society whose members have trouble expressing themselves verbally, the ethnographic approach can be quite helpful (Bryman, 2016; Zikmund, W; Babin, B.J.; Carr, J.C.; Griffin, 2020). The current research doesn't take into account cultural differences in eHealth adoption. The study's technique and goals are not compatible with ethnography as a research method.
Action research	Simply put, action research is "learning by doing": a group identifies a problem, attempts to solve it, evaluates the success of their efforts, and if unsatisfied, tries again (O'Brien, 1998). It lacks rigor and is susceptible to bias, which is a downside of action research. and their outcome is limited, situational, and constrained by context(Hamilton & Varey, 2020).
Archival research	The scope of archival research methods is extensive, covering a wide range of practices that aid in the examination of written materials and documents related to organizations. Typically, these methods involve scrutinizing historical papers or documents from bygone eras, offering us valuable insights into individuals, events, and organizations that would have otherwise remained inaccessible(Ventresca & Mohr, 2017).
Case studies	According to Easton, "case study research" is a method that entails the investigation of a single or a limited number of social entities or situations. The research process involves the collection of data from multiple sources. The issue of generalization is sometimes seen as the most significant shortcoming of case study research. Due to the small-N problem, case studies are commonly criticized on the grounds that their conclusions cannot be easily generalized to other contexts(Tsang, 2014).
Narrative inquiry	First and foremost, narrative inquiry is a technique of understanding experience. As a method, narrative inquiry incorporates a perspective on the phenomenon. To employ narrative inquiry methodology is to embrace a specific perspective of experience as the phenomenon being investigated (Clandinin & Huber, 2010). The objective of narrative inquiry is to understand the knowledge gained from an individual's description of their experiences. Experiences are investigated through the elements of temporality, sociality, and spatiality in narrative inquiry (Haydon & van der Riet, 2017). Consequently, it is appropriate for qualitative research.

Source: Own elaboration adapted from Mayer (2015), Camilleri et al. (2019), Silva (2008), Bryman (2016), Zikmund et al (2020), O'Brien (1998) Ventresca and Mohr (2017), Tsang (2014), Clandinin and Huber (2010), Haydon and van der Riet (2017).

3.4.3. Time Horizon of Thesis

The final layer of the research onion highlights the time horizon for which the study is conducted. Researchers often use cross-sectional methods such as surveys or case studies When they aim to answer a question or address an issue at a specific time. On the other hand,

longitudinal research is employed when data needs to be collected over an extended period to answer the research question. This involves techniques such as experiments, action research, grounded theory, and archival research (Saunders & Tosey, 2012). Cross-sectional field studies are commonly utilized in published research when there is a wealth of existing theories but uncertainty or discord regarding the constructs upon which these theories are based their interrelationships, or their empirical interpretation. This type of research typically falls under the umbrella of theory refinement to enhance the precision of theoretical concepts by presenting explicit statements that challenge, redefine, or refine current constructs and relationships (Lillis & Mundy, 2005).

In the current study, the researcher investigates the factors influencing patients' motives for adopting eHealth and extends the unified theory of acceptance and use of technology (UTAUT) with a public value scale to determine patients' intention and habit to adopt the eHealth initiative "My Hakeem." Therefore, a cross-sectional time horizon is used to conduct the research.

3.4.4. Population of Study

Jordan is a prominent Arab nation located in the southwestern region of Asia, widely regarded as the geographic center of the Middle East. It boasts a rich history and is a popular destination for global tourists seeking to explore its historical sites, with particular emphasis on Petra, an ancient city widely regarded as the heart of Nabataean Arab civilization and one of the most renowned archaeological sites in the world (Klaib & Nuser, 2019).

In recent years, Jordan has shown a keen interest in the domain of health service providers and eHealth systems. In October 2009, under the direction of His Majesty King Abdullah II Bin Al Hussein, Electronic Health Solutions (EHS) launched the Hakeem program, the country's first initiative of its kind to automate the public healthcare system in Jordan. The program's ultimate goal is to adopt an EHR system across the Kingdom to improve healthcare delivery efficiency and quality.

The Hakeem program has been successfully implemented by Electronic Health Solutions (EHS) at a total of 219 sites located across diverse urban centers in Jordan, including 43 hospitals, 72 comprehensive clinics, and 104 primary clinics. The program has executed an impressive 30,518,853 patient transactions, encompassing both inpatient and outpatient services, since its inception (report provided by EHS company). The following cartographic representation, as documented on the EHS website, illustrates the dissemination of the Hakeem initiative's execution.

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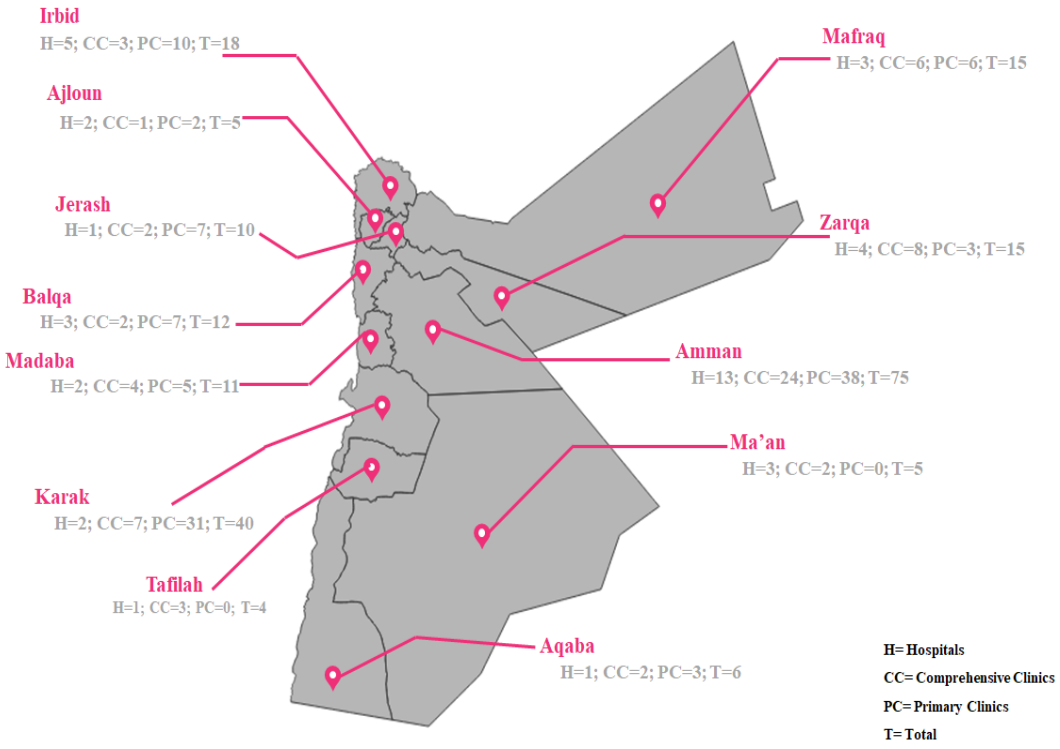

Figure 30. Implementation map of Hakeem program.
Source: Own elaboration adapted from Electronic Health Solutions (2023).

In recent years, Electronic Health Solutions (EHS) has been dedicated to enhancing healthcare facilities' quality of services and patient experience by achieving its established strategies and objectives. To support this mission, EHS developed the MyHakeem app on behalf of the Ministry of Health. MyHakeem is a mobile application that allows users to access and view their pre-booked medical appointments and medical information, including active and pending medications, recent vaccinations, pending and complete laboratory tests, allergies, and vital signs. These details are stored on their electronic health records registered within any healthcare facility. Additionally, users can arrange for the automatic delivery of monthly prescription drug refills. Patients can access MyHakeem services via the MyHakeem app or the MyHakeem platform on MyHakeem.jo anytime and anywhere they need them (MyHakeem App Store, 2023). As of August 2023, the MyHakeem app had been downloaded by approximately 100,000 users from the App Store and Google Play.

On the other hand, the present study endeavors to construct and authenticate an eHealth adoption scale that concentrates on patients' viewpoints and facilitates quantitative survey research. In order to attain this objective, the optimal population for sampling comprises patients who utilize the MyHakeem mobile application within the Jordanian public healthcare system.

3.4.4.1. Study Sample Size

Once the optimal research methodology has been identified, the subsequent phase involves formulating a strategy for selecting a suitable sample population. In the field of research, the concept of a "sample" is widely recognized as a limited portion or subset of individuals selected from the target population. The target population, in essence, denotes the complete cohort of individuals whose attributes are of significance to the team conducting the research (Martínez-Mesa et al., 2016). (Zikmund et al., 2013 p.67) proposes a set of consecutive determinations that must be taken into account prior to the acquisition of a sample.

Initially, it is essential to specify the targeted population. The present study focused on patients who utilized the MyHakeem app or website within the Jordanian public healthcare system. The aim was to assess patients' viewpoints regarding their experience with the MyHakeem app. There are no publicly available statistics regarding the actual usage of the MyHakeem app. Nevertheless, as per the data provided by Electronic Health Solutions (EHS), the Google App Store, and the App Store, it can be inferred that the application has been downloaded by a significant number of patients, reaching to around 100,000 in August 2023.

Selecting the sampling unit and sample size is the next step in addressing the sampling issue (Zikmund, W; Babin, B.J.; Carr, J.C.; Griffin, 2020). There are two main types of sampling methods: probability and non-probability sampling methods (P. G. Miller et al., 2010; Zikmund, W; Babin, B.J.; Carr, J.C.; Griffin, 2020). This study chose a probability sampling technique as it is the most effective method for avoiding a biased selection process (M. Saunders et al., 2016). Probabilistic random sampling is preferable because it enables the researcher to generate data for the entire population using a probabilistic method, which helps prevent sampling bias (Etikan & Bala, 2017).

Furthermore, the simple random sampling technique ensures that every unit within the population has an equivalent probability of being selected for inclusion in the sample. If the population is homogeneous, this technique can yield a more accurate and unbiased estimation of parameters (Singh & Masuku, 2014), as observed in the present study population (which is all patients who use the "MyHakeem" app in the Jordanian public healthcare system).

When conducting research with a limited timeframe and resources, it is essential for the researcher to carefully select the sampling method and size based on the population being studied. One common approach is random sampling, which involves drawing a random sample from a predetermined population. While some attempts have been made to adapt Structural Equation Modeling (SEM) techniques for smaller sample sizes, it has generally been agreed that SEM is best suited for analyzing extensive samples (Kline, 2015).

Empirical evidence suggests that a minimum of 200 respondents is necessary for effective SEM in quantitative research (Igundunasse, 2016; R. B. Kline, 2016; Siddiqui et al., 2015). In this study, the researcher used the Soper method (2023) by accessing the following website (http://www.danielsoper.com/statcalc/calculator.aspx?id=89) to determine the required sample size for SEM based on the effect size. Mizutani et al. (2015) state that an effect size of 0.1 to 0.3 is considered minor, 0.3 to 0.5 is moderate, and anything more than 0.5 is considered oversized. Therefore, a moderate effect size of 0.30 was deemed appropriate for this study.

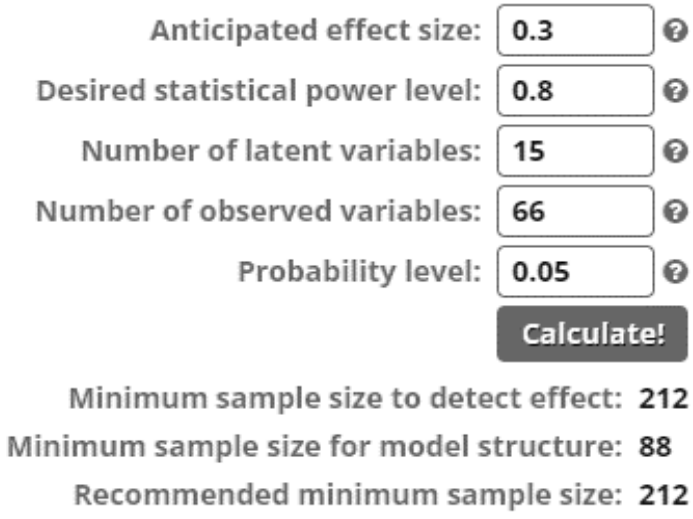

Figure 31. Calculate the required sample size for SEM.
Source: Own elaboration adapted from Soper (2023).

In order to accurately distinguish between strong and weak models in SEM, it is crucial to assess statistical power (Hermida et al., 2015; McQuitty, 2004). Business research, in particular, requires a minimum statistical power of 0.80 (Franck & Damperat, 2022). Cohen and Hemphill also recommend a statistical power of 0.80, a significance level of 0.05, and specific numbers of latent variables and study items for social management research (Gignac & Szodorai, 2016). This study examines 15 latent variables and 66 observed items. With a desired power of 0.8, effect size of 0.3, and significance threshold of 0.05, a minimum sample size of 212 is necessary for the model structure (as illustrated in Figure 31).

In addition, the present research employed both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) techniques to evaluate the proposed model. However, conducting EFA and CFA on the same data may result in unfavorable outcomes, as it may produce overly optimistic model fit indices and parameter estimates (Fokkema & Greiff, 2017). Consequently, it is advisable to split the sample equally into two halves (Kyriazos, 2018). The most optimal approach to splitting the dataset into subsamples is the SOLOMON approach, as introduced by Lorenzo-Seva (2022). This approach required at least 400 participants to divide the dataset appropriately (Lorenzo-Seva, 2022).

In order to address the issue of multivariate normality violation, it is necessary to plan for a larger sample size to enhance the robustness of the standard errors and parameter estimates, thereby yielding reliable results(Orathai et al., 2023). Finally, the researcher obtained 465 responses, which surpasses the minimum threshold for the EFA, CFA, and SOLOMON methodologies.

3.4.5. Questionnaire Administration

Academics utilize various tools, such as expert opinions, interviews, and questionnaires, to gather primary data that aligns with their research objectives (Sileyew, 2019). In this particular study, a questionnaire was employed as the primary data collection instrument, in line with Kabir's (2016)definition of a questionnaire as a tool comprising a sequence of questions and additional cues designed to collect participants' data.

Questionnaires are widely accepted as an appropriate instrument for collecting primary data in research settings that require reliable and consistent information about the subjects being studied. One of the key advantages of using questioning as a research method, as opposed to observation, is the ability to gather a more diverse range of data. Questioning methods can elicit information about attitudes, intentions, motivations, and past behavior that is typically concealed in observational research. In essence, questioning methods can be used to determine how a person behaves and why (Hair J.F. et al., 2017).

The current research utilized a questionnaire to achieve several benefits, including its usefulness in collecting information on sensitive topics. Questionnaire research is also cost-effective and provides an efficient means of gathering data (Patten, 2016).

The questionnaire items utilized in this study were derived from prior research. The process of administering questionnaires involves three distinct stages:

1. The creation of the questionnaire and selection of an appropriate scale of measurement
2. The translation of the questionnaire into Arabic and design of it on Google Forms
3. The dissemination of the finalized questionnaire through a link to patients

3.4.5.1. Initial Design for The Questionnaire

The questionnaire was carefully designed using insights from prior research in technology acceptance models and public value theory. The initial draft included 66 items, outlined in Appendix (10). The first section gathered essential patient demographic information, including gender, age, educational background, frequency of MyHakeem portal

usage, medical consultation history, and illness incidence. The second section assessed patients' public values and their direct impact on the use of the MyHakeem app, utilizing instruments created by Mynhardt (2021), Meng et al. (2022), Wu et al. (2021), and Bozeman (2007). The third section focused on seven stimulus factors (refer to Appendix 10), sourced from studies featured in Appendix 13, to evaluate their impact on patients' public values. The fourth section centered on patients' responses to adopting an eHealth application, with three constructs related to habit, implementation intention, and usage behavior. Lastly, the fifth section aimed to identify common method bias in patients' responses through a marker variable, referred to as "blue attitude," consisting of four items from Simmering et al. (2015) (see appendix 10).

3.4.5.2. Scale of Measurement

Scales are essential for assessing clients' attitudes, behaviors, and intentions. Utilizing well-designed scales enhances the accuracy of measuring phenomena and provides decision-makers with more reliable data (Hair et al., 2017). Among the commonly used response scales in survey design is the Likert scale. Developed by American social psychologist Rensis Likert in the 1930s, this psychometric scale features a five-point rating system for measuring a sequence of attitude-related statements (Chyung et al., 2017).

The Likert scale's unique format prompts respondents to indicate their agreement or disagreement with a given statement (Hair et al., 2017). This study aimed to evaluate the adoption of eHealth (MyHakeem app) technology in the Jordanian healthcare system, making the Likert scale an appropriate choice. Research has shown that using a five-point scale significantly increases reliability and validity (Dawes, 2008). The study questionnaire employed a 5-point Likert scale with the following options: strongly disagree, disagree, neutral, agree, and strongly agree.

3.4.6. Data Analysis Techniques

In this research project, statistical techniques will be used to analyze primary data. Descriptive statistics will offer valuable insights into the participants and their demographics and information on the research variables. Structural Equation Modeling (SEM) is a crucial tool for assessing the structural model, testing hypotheses, and validating the measurement model. This will be accomplished through data collected from patients who use the Hakeem application in public health institutions. SEM enables both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), which will be primarily used to evaluate the validity and reliability of the conceptual framework and hypotheses.

3.4.7. SEM Over Other Methodologies

Scholars utilize various first-generation multivariate data analysis techniques such as multiple regression, logistic regression, discriminant analysis, and variance analysis to test the hypothesized relationships among the variables of interest empirically. These techniques have three primary limitations:

1- Assuming a simple model structure.
2- Requiring all variables to be observable.
3- Assuming that all variables are measured without errors.

To overcome these limitations, researchers increasingly rely on second-generation techniques, such as structural equation modeling (SEM) (Hair et al., 2021). In modern research, investigating the interaction of numerous independent variables with the dependent variable is crucial, and their influence can be direct or indirect. Structural equation modeling (SEM) enables researchers to simultaneously model the interactions between several independent and dependent components, allowing them to answer a set of interrelated research questions in a single, systematic, and thorough manner (Elangovan & Rajendran, 2015).

Using data from Jordanian users of eHealth technology, Structural Equation Modeling (SEM) will be essential for evaluating the structural model, testing hypotheses, and validating the measurement model. A structural equation model comprises two models: the measurement model (confirmatory factor analysis) and the structural model (refer to Figure 32) (Hair et al., 2006).

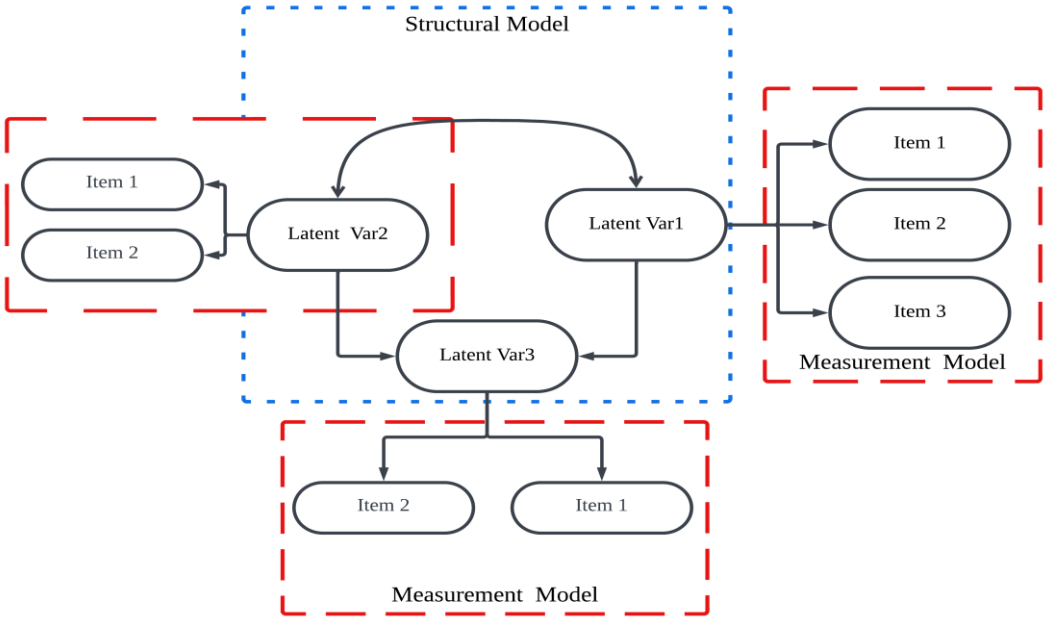

Figure 32. A structural equation models.
Source: Own elaboration adapted from Beran and Violato (2010).

In Figure 32, the measurement model consists of observable variables (1-3) and latent variables that are commonly used in research. These latent variables are created through factor analysis and are composed of two connected observable variables. They are thought to better represent the research constructs due to their lower measurement errors (Beran & Violato, 2010).

The structural model, on the other hand, supports the anticipated relationships between variables in order to represent the hypotheses formulated in SEM research (R. Kline, 2011). According to Hair et al. (2006), the structural model is a set of dependent relationships that connects the elements of the hypothetical model, as seen in Figure 32. The current study's model, the "Patient Value Model," will describe direct and indirect relationships between constructs through a structural model and account for the amount of explained and unexplained variance.

3.4.7.1. Components of SEM

There are two types of SEM: covariance-based SEM (CB-SEM) and partial least squares SEM (PLS-SEM) (Hair et al., 2021). CB-SEM utilizes a maximum-likelihood function to minimize the differences between the sample's covariance and those estimated by the theoretical model (Byrne, 2013a). On the other hand, PLS-SEM iteratively estimates partial model relationships in ordinary least squares regressions to maximize the explained variance of endogenous latent variables (Hair et al., 2021).

CB-SEM is particularly useful for investigating the extent to which the hypothesized model is supported by the sample data and rejecting hypotheses if the sample data does not match the theoretical model (Byrne, 2013a). When the prior theory is robust, researchers typically employ CB-SEM for theory testing and confirmation (Schumacker & Lomax, 2004). CB-SEM is best suited for large samples, ideally based on power analysis of a specific model, with minimal suggestions ranging from 200 to 800 (Chin & Newsted, 1999).

CB-SEM will be used in this study due to the large sample size and low to moderate model complexity (Chin & Newsted, 1999). The choice between CB-SEM and PLS-SEM should depend on the study's objectives (Hair, Hult, et al., 2017), with CB-SEM being appropriate for confirmatory research (Schumacker & Lomax, 2004). Therefore, CB-SEM will be utilized for data analysis to accomplish the study objective of undertaking confirmatory research (Chin & Newsted, 1999; Hair et al., 2017).

3.4.7.2. SEM Method Steps:

According to Beran & Violato, (2010), the process of generating and assessing a model in SEM consists of five steps. The steps are as follows:

3.4.7.2.1. Identify The Research Problem

Scholars develop hypotheses regarding the connections between variables, relying on existing empirical evidence, theory, or a combination of both. Next, they create a model by identifying the measurable and latent variables and their relationships. To facilitate this process, a path diagram showcasing the measurement and structural models can be helpful.

3.4.7.2.2. Identify The Model

The purpose of model identification is to determine whether the model is over-identified, under-identified, or just-identified (Fan et al., 2016). The most important factor in identification of the measurement model is that there are "enough" indications of each latent variable. There should be at least two indicators per latent variable, and the errors of those indicators must be uncorrelated. The one main exception to this criterion is that if the model contains only one latent variable and no other variables, there must be three uncorrelated indicators of the latent variables (Kenny et al., 1998)

The process of model identification involves determining whether the model is over-identified, under-identified, or just-identified, according to Fan et al. (2016). An essential aspect of identifying the measurement model is ensuring sufficient indications for each latent variable. This requires a minimum of two indicators per latent variable with uncorrelated errors. However, if the model has only one latent variable and no other variables, there must be three uncorrelated indicators of the latent variables (Kenny et al., 1998).

In the structural model, there are two common rules (Kenny, 2012): firstly, Minimum Condition of Identifiability “Let k be the number of constructs in the structural model. Let q = k (k - 1)/2. The minimum condition of identifiability is that q must be greater than or equal to “p” where p equals the sum of: a. number of paths, b. number of correlations between exogenous variables that are not caused by any other variable, c. number of correlations between the disturbance and some exogenous variables, and d. number of correlations between disturbance.” And the second rule is an Apparent Necessary Condition which state that all models that satisfy the following condition appear to be identified: If between any pair of constructs, X and Y, no more than one of the following is true:

- X directly causes Y
- Y directly causes X
- X and Y have a correlated disturbance
- X and Y are correlated exogenous variables

Furthermore, according to Kline (2016), There are two critical factors that can influence whether model determination is achieved or not:

A. Scale must be allocated to each latent variable (including error terms and disturbances) within a model.
B. The model degrees of freedom are ≥ 0.

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3.4.7.2.3. Estimate The Model

SEM utilizes various estimation methods such as Maximum Likelihood (ML), Generalized Least Squares, Weighted Least Squares, and Partial Least Squares. Most SEM software packages, including AMOS, default to ML estimation (Fan et al., 2016), which is suitable for normally distributed data. If assumptions regarding data distribution, independence, and asymptotic sample size are violated, Least Squares (LS) are used. For skewed or peaked data, asymptotically distribution-free (ADF) estimation procedures (Weighted Least Squares) are more appropriate. However, ML estimation is considered more reliable than ADF (Beran & Violato, 2010).

3.4.7.2.4. Determine The Model's Goodness of Fit

The estimating techniques are used to assess how well the model fits the data. Fitting the latent variable path model requires reducing the gap between the sample covariance and the predicted covariance (Beran & Violato, 2010). Various techniques exist for evaluating the adequacy of a model's fit.

Nonetheless, the issue at hand pertains to the rationales for implementation, the fluctuating thresholds of acceptance, and the determinations rendered for a satisfactory fit. Furthermore, a limitation of the utilization of multiple indicators was the need to take into account the fundamental assumptions underlying each fit index and the strategies employed to address potential issues with a particular method (such as the number of variables in the model and the sample size, which are inversely related to the model's goodness of fit) (Crawford & Kelder, 2019; Gaskin & Lim, 2017).

Thus, the current study followed Crawford and Kelder's (2019) and Gaskin & Lim's (2017) guidelines for best practices for researchers to follow when selecting model fit indices. This checklist takes into account the number of variables in the model as well as the size of the sample. They indicated that the P close, Chi-square/df, p-value for the model, CFI, SRMR, and RMSEA were the most robust indices for testing the model using the SEM methodology (Crawford & Kelder, 2019; Gaskin & Lim, 2017).

Table 9. Model Fit Thresholds.

Measure	Threshold
Chi-square/df (χ^2/df)	<3 Good; <5 sometimes permissible
p-value for the model	>.05
CFI*	>.95 great; >.90 Satisfactory; >.80 sometimes permissible
SRMR*	<.09
RMSEA*	<.05 good; .05 - .10 Moderate; >.10 bad
P close	>.05

Source: Own elaboration adapted from Crawford and Kelder (2019) and Gaskin (2018).
***Note*: CFI= Comparative Fit Index; RMSEA= Root Mean Square Error of Approximation; SRMR= Standardized Root Mean Square Residual.**

3.4.7.2.5. Re-specify The Model if Necessary

For more accurate fitness outcomes, it is advisable to repeat the steps above until the model is as concise as possible. Inspecting the standardized residual values between variables is recommended to enhance the accuracy of the model estimates. If the residuals are sizeable, it may indicate that the model's fit is inadequate. Recalculating the model may improve the fit and reduce the residual values, as per Beran and Violato (2010).

3.4.8. SEM Software

Although there are several statistical software packages that can be utilized to analyze the concept of Structural Equation Modeling (SEM), the researcher opted to restrict himself to a single package. The software program IBM SPSS Amos v26, which stands for Analysis of

Moment Structures, is a tool utilized in academic research for statistical analysis. IBM® SPSS® Amos is a robust software for structural equation modeling that facilitates the reinforcement of research and theories by expanding conventional multivariate analysis techniques such as regression, factor analysis, correlation, and analysis of variance. SPSS Amos enables the construction of attitudinal and behavioral models that depict complex connections with greater precision than conventional multivariate statistical methods, utilizing either an intuitive graphical or programmatic user interface (Dash & Paul, 2021).

Nonetheless, the present investigation utilized IBM SPSS version 26, the R program, and SPSS Syntax to conduct preliminary analyses of the data. Table 10 lists all the statistical techniques employed in the current research.

Table 10. Statistical tests and tools used in the study.

Required analysis	Analytical method	Software used	Purpose for use
Detect multivariate outliers	Cook's distance and Mahalanobi's distance	IBM SPSS 26	Identify and address outliers.
Multivariate & univariate normality tests	the Henze-Zirkler test, Mardia's multivariate, Skewness, kurtosis and graphical methods (histogram, normal P-P plot)	R* Program/ IBM SPSS 26	Assess the normality of the items.
Demographics	Descriptive statistics (Mean, Standard Deviation, Percentages).	IBM SPSS 26	Describe the respondent demographics.
Cross-validation design	SOLOMON method	R* Program	Splitting a study's sample into equivalent subsamples in factor analysis
Exploratory Factor Analysis	To perform exploratory factor analysis and create a pattern matrix, Cronbach's alpha coefficient and McDonald's omega coefficient	IBM SPSS 26 and plugin's Andrew F. Hayes	To check the factorability of the 66 items of the patients' public value scale and reliability (Omega and Alpha). An estimate of omega is based on the factor loadings of a forced single-factor maximum likelihood factor analysis using SPSS's built-in FACTOR procedure.
Optimal number of factors	Parallel Analysis	R* Program/ SPSS syntax	Double-check the optimal number of factors.
Check the measurement model	Structural Equation Modelling (SEM) Confirmatory Factor Analysis (CFA), Average Variance Extracted (AVE), Composite reliability Maximal Reliability, HTMT validity	IBM SPSS 26/ AMOS 26 with the plugins of Gaskin & Lim, 2017	Examine the reliability, convergent validity, and discriminant validity of items and constructs.
Common Method Bias	The confirmatory factor analysis (CFA) marker approach	AMOS 26	Determine whether there is a common method bias.
Test the structural model	Structural Equation Modelling (SEM)	IBM SPSS 26/ AMOS 26	Analyze the relationship between independent, dependent, and mediator factors.

Source: Author.

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3.5. Initial Data Examination, Screening and Preparation

Data screening is a crucial step in statistical analysis that involves verifying the cleanliness and readiness of data before proceeding with subsequent analyses. It is also commonly known as "data screaming." The screening of data is essential for determining its usability, reliability, and validity for the purpose of testing theoretical constructs (Gaskin & Lim, 2017). The present part of the study encompassed three stages of data screening and initial analysis: 1) Outliers among cases 2) Sample size and missing data 3) Assumption of Normality(Tabachnick & Fidell, 2007).

3.5.1. Analysis of Outliers

A multivariate outlier is a data point that shows uncommon (infrequent) values on two or more variables, and the detection of it is the vital mission of statistical analysis of multivariate data. (Doulah, 2018). To detect multivariate outliers in the current study, Cook's distance and Mahalanobi's distance were used due to their high sensitivity to detecting multivariate outliers (Dashdondov & Kim, 2023; Kannan & Manoj, 2015).

Cook’s distance (Di) is defined as a tool for identifying one influential point or sets of influential observations (Díaz-García & González Farías, 2004). To identify multivariate outliers through Cook’s distance (Di), Aguinis et al. (2013) suggested the following steps: At first, it is necessary to compute Cook's distance score. As a rule of thumb, outliers are identified by a Cook distance of 1.0 or higher. For smaller sample sizes or larger datasets, a more conservative approach is recommended, with a threshold of 4/(n-k-1), where n represents the sample size and k represents the number of independent variables.

The present study involved a total of 15 predictors and 465 observations. Consequently, the threshold value was found to be 0.0089 by employing the formula 4/ (465-15-1). A recommended threshold of 4/N has also been suggested by researchers. The value of 0.0086 can be obtained by dividing 4 by the sample size of 465 in the present study. Consequently, the author decided to select the minimum value of 0.0086 in order to attain a heightened level of precision (Blatná, 2006; Bollen & Paxton, 1998; Hair et al., 2019). second draw a scatter plot chart for it (see figure 33), and third, any value that sticks out from the others should be omitted, (like the 25 cases higher than 0.0086 in figure 33). See Aguinis et al. (2013).

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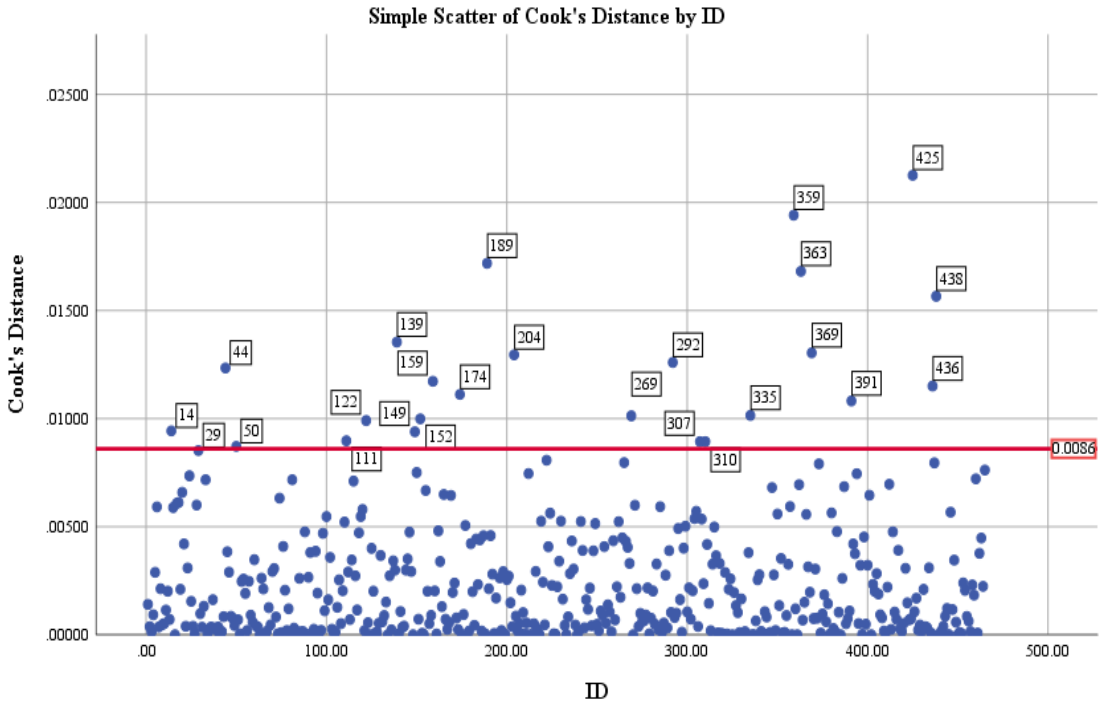

Figure 33. Simple Scatter of Cook's Distance by ID.
Source: Author.

Multivariate outliers are additionally detectable through the use of Mahalanobis distance, which is the distance between a data point and the calculated centroid of the other cases, where the calculated centroid is the intersection of the means of the factors being evaluated. Each point is identified as an X~Y combination, and multivariate outliers are positioned at a predetermined distance from the other cases. The distances are interpreted using a $p < 0.001$ and the corresponding $\chi 2$ value, with the degrees of freedom equal to the number of variables (Dashdondov & Kim, 2023). The present research had 15 degrees of freedom, corresponding to a Chi-square value of 112.719 (at P =.001). There was 1 case where the distance tally exceeded this critical value.

In a nutshell, the sample contains a total of 26 outliers identified by Cook's distance and Mahalanobi's distance. There are three primary approaches to handling outliers within a dataset, one of which includes the removal of outliers from the dataset (Kwak & Kim, 2017). Excluding outliers was previously an accepted approach for handling outlier data points. The exclusion of outliers was deemed a desirable approach for the purpose of robust statistics, as noted by (Ghosh & Vogt, 2012; Hair et al., 2019). The current study involves the exclusion of outliers from the dataset due to their potential violation of the assumptions of numerous statistical techniques, particularly those predicated on a normal distribution of the data (Knief & Forstmeier, 2021).

In addition, it has been noted that the presence of an outlier alone has the potential to significantly impact the slope of the regression line, thereby reducing its fit to the data (Erceg-Hurn & Mirosevich, 2008). And Statistical parameters, such as means, standard deviations, and regression coefficients, can be significantly impacted by outliers. Eliminating outliers can result in less biased estimates that are more reflective of the majority of the data points. The argument is supported by various scholars (Aguinis et al., 2013; Osborne & Overbay, 2004; Sullivan et al., 2021)

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3.5.2. Sample Size and Missing Data

The unit of analysis in this study comprised patients who either downloaded the MyHakeem mobile application or utilized the web-based version of the MyHakeem app. The questionnaire was distributed between April 19th and July 5th. The distribution of 478 questionnaires yielded a response rate of 97.3%, as only 465 completed forms were returned. No missing values were observed across all variables. However, the dataset contained 26 outlier values and 9 straight-lining or response biases, accounting for 7.5% of the sample. Ultimately, the final sample size consisted of 430 respondents. The sample size was adequate for conducting Structural Equation Modeling (SEM).

3.5.3. Multivariate Normality Test

Numerous parametric multivariate statistical techniques, including SEM, linear discriminant analysis, principal component analysis, etc., require evaluating the assumption of multivariate normality (Hair et al., 2019; Korkmaz et al., 2014). It is necessary to evaluate multivariate normality before proceeding with these statistical methods. There are numerous proposed analytical methods for determining multivariate normality. However, deciding which method to use is a difficult task because each method may yield various results under specific circumstances.

In light of this, it can be concluded that there is no optimal method that is applicable under all circumstances for normality checking. In addition to numerical results, graphical methods are extremely useful for determining multivariate normality. Combining the numerical results of multiple methods with graphical approaches can be beneficial and lead to more trustworthy decisions (Korkmaz et al., 2014).

In this study, several methods were used to assess the multivariate normality test, including skewness and kurtosis, the Henze-Zirkler test, Mardia's multivariate, and graphical methods (histogram, normal P-P plot) to identify the shape of the distribution. Skewness is a measure of the degree of symmetry in a distribution, while kurtosis relates to the degree of peakedness or flatness of a distribution relative to a normal distribution (Cain et al., 2017). According to George's (2011) recommendations, a normal univariate distribution can be considered acceptable if the values for asymmetry and kurtosis fall within the range of -2 to +2. Kline (2011) proposed that data can be deemed as normally distributed when its skewness falls within the range of 3 to -3 and its kurtosis falls within the range of 10 to -10. And as shown in appendix 11, all items fall within this range.

Additionally, the study data underwent multivariate normality testing using Henze-Zirkler's and Mardia's tests. Following are the hypotheses underlying these tests: H0: The respondents' scores have a multivariate normal distribution; H1: The respondents' scores do not have a multivariate normal distribution. Table 11 displays the results of both tests (Oppong & Agbedra, 2016). The null hypothesis of multivariate normality has been accepted at a significance level of 0.05. Consequently, it can be inferred that both tests indicate the multivariate normality of the data.

Table 11. Test for MVN Using Henze-Zirkler's test and Mardia's test.

Test	Henze-Zirkler's MVN	Mardia's MVN			
		Skewness		Kurtosis	
		b	z	b	z
Test Statistics	0.9998314	706.19	50610.42	4486.6477	- 0.1480
P value	**0.075**	**0.0595**		**0.8823**	

Source: Own elaboration adapted from Korkmaz et al. (2014).
***Note*: * MVN = Multivariate Normality.**

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Finally, the graphical methods (histogram and normal P-P plot) of residuals show that they are normally distributed. And the plot of standardized residuals versus standardized predicted

values indicated no show signs of funneling, suggesting the assumption that the variance of the residuals is constant (Hair et al., 2019) (see figure 34).

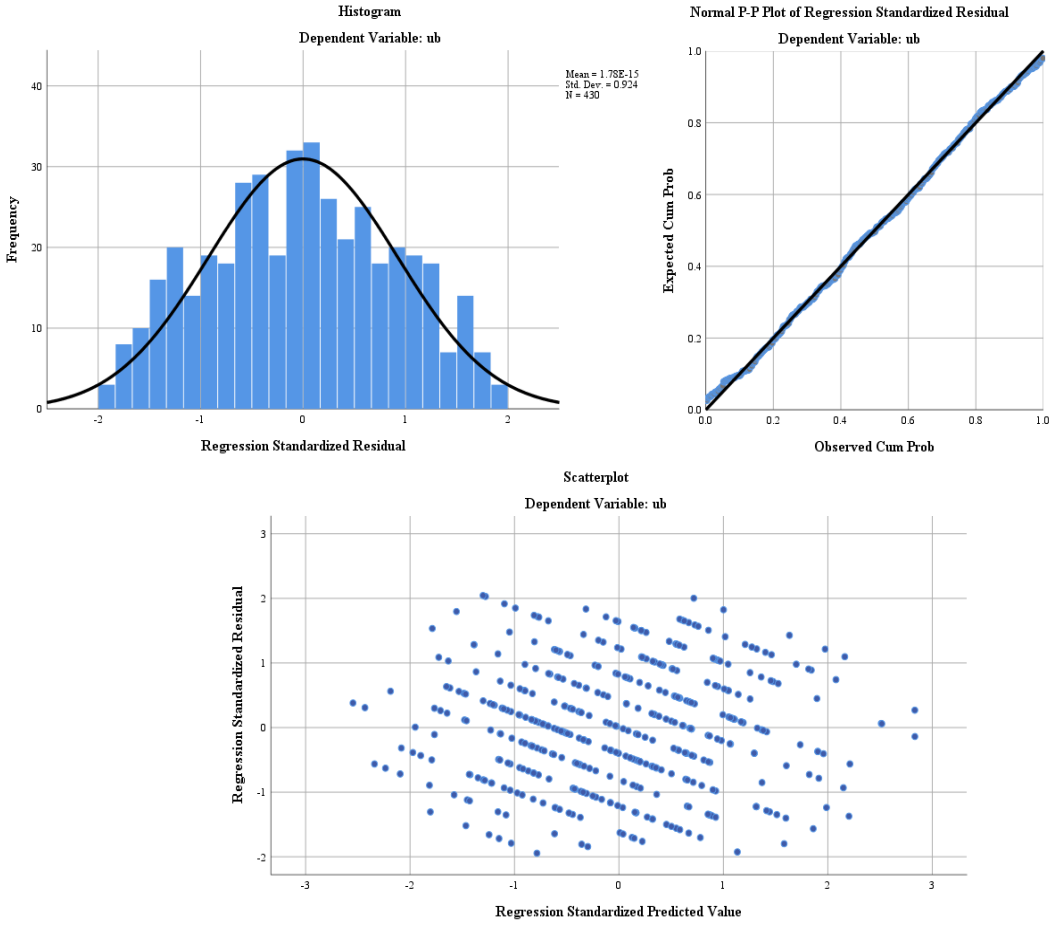

Figure 34. Graphical methods for testing the normal distribution. Source: Author.

3.5.4. Cross-Validation Design (EFA, and CFA)

Factor analysis can be conducted using two distinct approaches: exploratory factor analysis and confirmatory factor analysis (Matsunaga, 2010). Both CFA and EFA are statistically solid methods. Examples of CFA and EFA include the creation of measurement instruments, such as a satisfaction scale, a survey of health-related attitudes, or a customer service questionnaire (Suhr, 2006). At the same time, both techniques are employed to investigate the fundamental factor structure of the data (Matsunaga, 2010).

On the one hand, Exploratory Factor Analysis (EFA) can be employed as a statistical technique to explore the underlying patterns that exist within a given data set. Consequently, the application of Exploratory Factor Analysis (EFA) can facilitate the explication of the interrelationships among diverse items and constructs as well as contribute to the formulation of novel theoretical frameworks. The utilization of EFA is deemed appropriate in the initial phases of the development of an instrument. Through the utilization of Exploratory Factor Analysis (EFA), the researcher can identify items that lack empirical association with the intended construct and thus require removal from the survey instrument.

Moreover, Exploratory Factor Analysis (EFA) can be utilized to investigate the dimensionality of the instrument (Knekta et al., 2019) Furthermore,, the utilization of exploratory factor analysis (EFA) is deemed significant in the process of scale development and in preparing for confirmatory factor analysis (CFA) (Crawford & Kelder, 2019).

On the other hand, confirmatory factor analysis (CFA) is a method of determining how well a predetermined measurement theory made up of measured variables and factors fits reality as seen in the data (Hair et al., 2019). The utilization of CFA has gained recognition as a significant analytical instrument across various domains of the social and behavioral sciences. This technique is classified under the family of structural equation modeling methods, which facilitate the exploration of causal relationships among observed and latent variables within predetermined models derived from theoretical frameworks. The primary benefit of the CFA methodology is its capacity to assist scholars in reconciling the often observed gap between theoretical constructs and empirical data (Mueller & Hancock, 2001).

Unlike the CFA approach, the EFA method is derived from statistical data rather than theory. This indicates that the researcher executes the software and allows the underlying data pattern to determine the factor structure. Thus, EFA and Principal Components (PCA) analyses are conducted without knowing the number of actual factors (if any) or the variables that pertain to which constructs. When either method is used, the researcher employs predetermined guidelines to determine which variables are best loaded onto a factor and how many factors to retain. Following exploratory analysis, the researcher identifies the factors.

In this regard, CFA and EFA are different (Hair et al., 2019). In contrast, the application of CFA in scale adaptation studies varies in practice. In some adaptation studies, both EFA and CFA are utilized, whereas in others, only CFA is employed. The exclusive use of CFA in adaptation studies may pose some difficulties. For instance, if a translation error occurred during an adaptation study, using the CFA alone could result in a situation that differs from what would actually occur, and the model could be misleading. In addition, a data set may be compatible with multiple CFA models (Hair et al., 2019; ORCAN, 2018), so it would be preferable to conduct an EFA first in order to identify potential cultural differences in the adaptation. In such a situation, if an EFA is not conducted, a researcher will not test a second model, as the first model already fits the data. Therefore, it is necessary to conduct an EFA to identify the potential error (ORCAN, 2018).

To overcome the EFA-CFA difference mentioned just above, Thompson offers a specific approach to determining the target construct's factor structure. This method employs both EFA and CFA at distinct stages, as follows: (a) An initial set of items is first screened by PCA; (b) the remaining items are then evaluated by EFA; and (c) the extracted factor solution is then examined by CFA (Matsunaga, 2010). Presently, exploratory and confirmatory factor analyses have become two crucial sequential components in a comprehensive analytical procedure. (Lorenzo-Seva, 2022).

In additional, if a researcher decides that Exploratory Factor Analysis (EFA) is the optimal method for analyzing the data, it is recommended that the outcomes of the EFA be validated through a Confirmatory Factor Analysis (CFA) prior to utilizing the measurement instrument for research purposes. It is not advisable to perform this confirmation on the identical sample used for the initial exploratory factor analysis (EFA). The act of doing so does not yield information that can be generalized, given that the CFA is essentially duplicating numerous relationships that were previously established via the EFA. Furthermore, there may be subtleties in the manner in which the specific sample reacts to stimuli that may not be present in a subsequent sample. Performing exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) on independent samples is considered a recommended approach for various reasons. When a researcher possesses a sufficiently large sample size, it is feasible to randomly partition the original sample into two independent groups (Knekta et al., 2019; Lorenzo-Seva, 2022).

Various techniques can be employed for splitting a dataset into equivalent parts, including the SOLOMON method proposed by Lorenzo-Seva (2022) and this method optimally splits the sample in two equivalent halves, and guarantees the representativeness of the subsamples

(i.e., all possible sources of variance are enclosed in the subsamples). In this study, a cross-validation was conducted using the SOLOMON method, which involves randomly dividing the total sample into two subsamples, as illustrated in Table (12). One subsample was designated for exploratory factor analysis (EFA), while the other was designated for confirmatory factor analysis (CFA). To obtain two equivalent subsamples, the KMO of the first subsample was 0.701 and the KMO of the second subsample was 0.674; therefore, the communality ratio (S) was calculated as S = min (KMO1, KMO2)/max (KMO1, KMO2) and equaled 0.989. Thus, a sample is considered successfully split (i.e., the two sub-samples are equivalent) if the value of the communality ratio (S) is close to 1 (Lorenzo-Seva, 2022). And this is what happened in the current study.

Table 12. SOLOMON method for split study's dataset.

Groups of Study's Sample	N	KMO*	Communality Ratio (S)
First Solomon subsample	215	0.701	0.989
Second Solomon subsample	215	0.674	

Source: Own elaboration adapted from Lorenzo-Seva (2022).
Note: *KMO: The Kaiser-Meyer-Olkin Measure of Sampling Adequacy.

In brief, currently, the utilization of exploratory and confirmatory factor analyses is considered a crucial sequential procedure within an overarching analytical process. The initial step in the comprehensive analysis involves conducting an exploratory factor analysis to investigate the data and formulate a hypothesis for the factor model in the population. Subsequently, it is recommended to proceed with a confirmatory factor analysis to evaluate the viability of the hypothesis posited during the exploratory phase within the population (Lorenzo-Seva, 2022).

3.5.5. Sample Characteristics

In this study, the demographic data of the sample was analyzed and presented in Table 13. The table provides information on gender, age, education level, frequency of product usage, doctor visits, and overall health status. Out of the total sample size of 430 individuals, 51.4% were male and 48.6% were female. Regarding age distribution, 41-50 years represented the largest percentage of participants (45.1%), followed 31-40 years (38.6%), ≥50 years (8.8%) and 18-30 years (7.4%). In terms of education level, the majority had a bachelor's degree (47.9%), followed by postgraduate (41.6%) and high school (10.5%). When it comes to the frequency of the MyHakeem app's usage, 12.8% reported using it only once, 40.9% used it 2-3 times, and 46.3% used it 3 times or more. In terms of participants visits to doctors in the last 3 months, 54.7% of the participants reported visiting a doctor, while 45.3% did not. In terms of health status in the last 3 months, 51.6% reported being sick, while 48.4% reported not being sick. To more details see below table

Table 13. Demographic Data.

Demographic data	Categories	subsample				Total sample	
		EFA sample		CFA sample			
		Count	N %	Count	N %	Count	N %
Gender	Male	108	50.2%	113	52.6%	221	51.4%
	Female	107	49.8%	102	47.4%	209	48.6%
	Total	215	100.0%	215	100.0%	430	100.0%
Age	18-30 years	15	7.0%	17	7.9%	32	7.4%
	31-40 years	73	34.0%	93	43.3%	166	38.6%
	41-50 years	106	49.3%	88	40.9%	194	45.1%
	50 years and more	21	9.8%	17	7.9%	38	8.8%
	Total	215	100.0%	215	100.0%	430	100.0%
Education level	High school	24	11.2%	21	9.8%	45	10.5%
	Bachelor	111	51.6%	95	44.2%	206	47.9%
	postgraduate	80	37.2%	99	46.0%	179	41.6%
	Total	215	100.0%	215	100.0%	430	100.0%

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How many times a week do you use MyHakeem app?	Once times	34	15.8%	21	9.8%	55	12.8%
	2-3 times in week	89	41.4%	87	40.5%	176	40.9%
	More than 3 times	92	42.8%	107	49.8%	199	46.3%
	Total	215	100.0%	215	100.0%	430	100.0%
Have you visited a doctor in the last three months?	yes	123	57.2%	112	52.1%	235	54.7%
	No	92	42.8%	103	47.9%	195	45.3%
	Total	215	100.0%	215	100.0%	430	100.0%
Have you been sick in the last three months?	Yes	110	51.2%	112	52.1%	222	51.6%
	No	105	48.8%	103	47.9%	208	48.4%
	Total	215	100.0%	215	100.0%	430	100.0%

Source: Author.

3.6. EXPLORATORY FACTOR ANALYSIS

The current study used a five-step approach that Matsunaga (2010) recommended in order to investigate the factorial structure of the patients' value scale. He states that there are various steps in the process of factor analysis, including assessing the adequacy of sample size through techniques such as the correlation matrix, Kaiser-Meyer-Olkin (KMO), and Bartlett's Test. Next, factor extraction methods must be chosen, such as principal components analysis, principal axis factoring, image factoring, maximum likelihood, alpha factoring, unweighted least squares, generalized least squares, and canonical. Factor retention methods must also be selected, including cumulative percentage of variance, K1-Kaiser's, scree test, and parallel analysis. Additionally, rotational methods must be chosen, either orthogonal rotations or oblique rotations. Finally, the factors must be interpreted and labeled appropriately.

The factorability of the 66 items of the patients' public value scale was examined based on a previous protocol. Several established criteria for the factorability of a correlation were applied. First, it was observed that 58 of the 66 items had sufficient correlation with at least one other item. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.763, which was above the commonly recommended value of 0.6, and Bartlett's test of sphericity was significant $\chi 2$ (1653) = 11764.65, p <.001, indicating that correlation structure is adequate for factor analyses. Additionally, all diagonals of the anti-image correlation matrix were greater than 0.5. Finally, communalities were all greater than 0.30 (see Table 14), confirming further that each item shared some variance with other items. Given these overall indicators (Field, 2013; Hair et al., 2019), only 58 items were deemed sufficient for factor analysis.

The utilization of Maximum Likelihood Factoring (MLF) analysis was preferred over Principal Components Analysis (PCA) due to the latter's assumption of error-free data, which is not consistent with the social science field. Furthermore, the PAF methodology utilizes shared characteristics. The utilization of maximum likelihood factoring (MLF) is deemed appropriate when the data demonstrate multivariate normality, as in the current study data (Brenner, 2019). Therefore, all 58 items of the instrument were subjected to MLF extraction with oblique rotation (Promax). The maximum likelihood factor analysis with a cut-off point of 0.40 and the Kaiser's criterion of eigenvalues greater than 1 (see Field, 2013; Matsunaga, 2010) yielded a fifteen-factor solution as the best fit for the data, accounting for 75.99% of the variance (see table 14). The fifteen-factor solution is deemed more favorable due to: (a) its prior theoretical backing (see chapter 2); (b) the 'leveling off' of eigenvalues on the scree plot after fifteen-factor (see figure 35.); and (c) the parallel analysis approval for extracting the fifteen-factor solution (refer to appendix 2).

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A fifteen-factor solution was examined using oblique rotation (Promax), as recommended by Field (2013). 7 items were excluded from the analysis due to their inability to conform to a basic factor structure and failure to satisfy the minimum requirement of possessing primary factor communalities of 0.30 or higher. Additionally, 1 item displayed cross-loading near 0.4 into two factors. The factor loading matrix for this final solution is presented in Table 14. Additionally, Appendices 9 and 10 contained the questionnaire's initial draft and final version, which could be used to verify the items that were eliminated.

The ultimate stage of the exploratory factor analysis entails the assignment of appropriate labels to the identified factors. The naming of the factors in the present study is derived from a comprehensive review of the literature (see Chapter 2). In additional, the study assessed the internal consistency of the scale (patients' public value scale) by utilizing both Cronbach's alpha and McDonald's omega coefficients. The coefficients of alpha and omega exceeded 0.8, a threshold deemed acceptable according to Doval et al. (2023).

In contrast, composite scores were generated for each of the 15 factors by computing the mean of the items that were loaded on each factor. Higher scores indicated greater factors on the patients' public value scale. The patients' public value scale revealed that hedonistic motivation was most commonly reported, with a distribution that was negatively skewed. On the other hand, the quality of eHealth delivery was the least reported and had a distribution that was positively skewed. Table 15 displays the descriptive statistics.

According to Hair et al. (2019), the skewness and kurtosis values were within an acceptable range to assume a normal distribution. The study conducted an examination of multicollinearity pertaining to composite scores, and the results indicated that the range was deemed acceptable in accordance with the recommendations put forth by Daoud (2017) see appendix (1).

In summary, EFA analysis suggests that 15 factors underlie the sample responses to the patient's value scale items. Out of 66 items, eight were excluded, leaving 58 items. The composite score data showed a normal distribution, indicating suitability for confirmatory factor analysis.

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Table 14. Descriptive Statistics and Factor loadings for 215 patients on Patients Values Scale Items.

Items	α	ω	Factor Loadings																h2
EP12	0.944	0.945	.898																.802
EP1			.887																.835
EP2			.872																.789
EP13			.830																.734
EP11			.826																.763
EP10			.802																.678
IMI5	0.912	0.918		.862															.758
IMI6				.839															.708
IMI4				.819															.752
IMI3				.780															.643
IMI2				.779															.748
IMI1	0.903	0.913		.741															.643
HJ1					.929														.850
HJ2					.914														.806
HJ4					.891														.834
HJ3					.661														.535
HJ6					.514														.567
PC1	0.929	0.931				.912													.805
PC2						.907													.852
PC3						.896													.827
PC4						.807													.712
HB3	0.920	0.922					.952												.840
HB1							.914												.861
HB4							.779												.692
HB2							.779												.682
UM2	0.905	0.905						.940											.876
UM1								.846											.700
UM3								.844											.783
UM4								.735											.623
PU4	0.897	0.906							.897										.793
PU3									.890										.783
PU1									.821										.661
PU2									.784										.801
PTV2	0.896	0.900								.876									.736
PTV4										.842									.776
PTV3										.836									.693
PTV1										.818									.695
SV3	0.943	0.944									.984								.933

SV1											.910						.847
SV2											.877						.818
HM2	0.924	0.925										.965					.885
HM1												.869					.806
HM3												.830					.762
SI1	0.929	0.929											.910				.841
SI3													.893				.795
SI2													.865				.842
EPV3	0.904	0.909												.940			.848
EPV2														.870			.835
EPV1														.808			.705
QHD1	0.867	0.874													.907		.834
QHD3															.864		.697
QHD2															.757		.696
UB2	0.855	0.859														.911	.850
UB1																.802	.758
UB3																.715	.624
PB3	0.882	0.883														.894	.802
PB2																.870	.715
PB1																.670	.540
Eigenvalues			11.850	5.099	4.104	3.447	3.103	2.680	2.608	2.227	2.158	2.046	1.993	1.814	1.484	1.477	1.419	

EP: Patients empowerment; HJ: eHealth justice; IMI: Implementation intention; PC: Privacy Concerns; HB: Habit; UM: Utilitarian motivation; PU: Perceived usefulness; PTV: Public Trust Value; SV: Social value; HM: Hedonistic motivation; SI: Social influence; EPV: Ethical public value; QHD: Quality of eHealth delivery; PB: Perceived benefits; UB: Use behavior, h2 = communality; α= Cronbach's Alpha coefficient; ω=McDonald's Omega coefficient. Factor loadings < .4 are suppressed. Structure coefficients were almost identical to pattern coefficients

Source: Author.

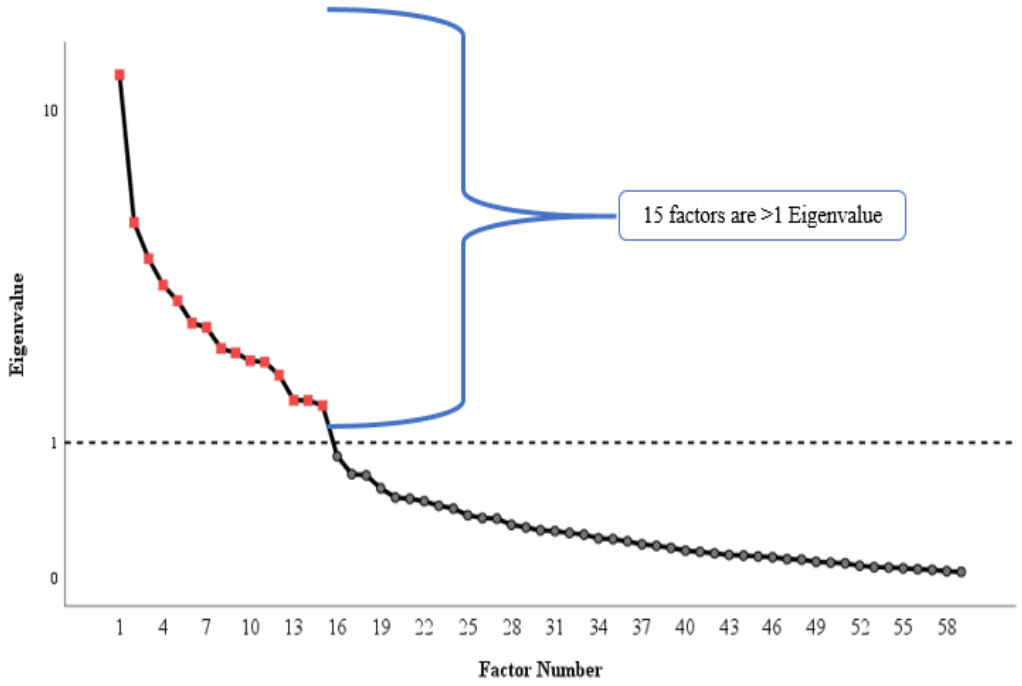

Figure 35. The scree plot of eigenvalues. Source: Author.

Table 15. Descriptive Statistics of EFA factors.

Constructs	Number of Items	N	M(SD)	Skewness	Kurtosis
Hedonistic motivation	3	215	3.06 (0.938)	-0.124	-0.318
Utilitarian motivation	4	215	2.78 (.708)	-0.203	-0.411
Social value	3	215	2.70 (1.026)	0.257	-0.45
Ethical public value	3	215	2.76 (0.933)	0.236	-0.407
Public Trust Value	4	215	2.75 (0.936)	0.216	-0.483
Empowerment of patients	6	215	2.89(0.896)	-0.124	-0.683
Social influence	3	215	2.76(1.005)	0.076	-0.651
Perceived benefits	3	215	2.92(1.028)	-0.095	-0.617
Perceived usefulness	4	215	2.87(0.902)	0.033	-0.535
Quality of eHealth delivery	3	215	2.54 (0.793)	0.051	-0.571
eHealth justice	6	215	2.65 (0.793)	-0.107	-0.668
Privacy Concerns	4	215	2.90 (0.946)	0.043	0.491
Implementation intention	6	215	2.76 (0.801)	0.008	-0.382
Habit	4	215	2.80 (0.903)	-0.056	-0.554
Use behavior	3	215	2.94 (0.924)	-0.129	-0.661

Source: Author.

3.7. MEASUREMENT THEORY (CFA)

The present study utilizes structural equation modeling as a crucial statistical methodology for data analysis. There are two distinct categories of SEM, namely measurement models and structural models. Measurement models define the associations between the manifest variables and the unobserved variables Indeed, an entire subfield of psychology, known as psychometrics, is devoted to determining how to quantitatively measure latent psychological constructs. The framework of psychometric theory enables researchers to establish a valid measurement theory. CFA, which is a type of factor analysis, is the primary multivariate statistical technique for psychometricians. Structural models serve the purpose of evaluating

the hypothesized relationships between constructs in a proposed model. The measurement model is converted into a structural model by establishing the relationships between constructs according to theoretical principles (this happen in chapter 4) (Hair et al., 2019).

In contemporary research, it has become customary to perform a sequence of factor analyses during the process of constructing a novel measurement instrument. Typically, researchers start their analysis by defining an exploratory factor analysis (EFA) model to assess a preliminary set of items. Subsequently, they transition to a confirmatory factor analysis (CFA) framework to conduct a more comprehensive evaluation of the extent to which a theoretical model accurately reflects the empirical data.

By means of this methodology, scholars can ascertain the optimal quantity of unobserved variables that accurately embodies the concepts of concern, as well as the configuration of relationships (i.e., factor loadings) between the observable indicators and the unobserved variables. Consequently, the utilization of Confirmatory Factor Analysis (CFA) can assist scholars in determining the appropriate emphasis on either the overall score of a measurement or the subcategories that consist of specific items from the aforementioned measurement. The utilization of CFA offers more advanced techniques for assessing various psychometric properties, including reliability, in comparison to conventional approaches like Cronbach's alpha. Due to these factors, it is highly recommended that researchers utilize CFA during the process of constructing and verifying novel measurement instruments (Gallagher & Brown, 2013).

In this study, the proposed model was evaluated using both types of structural equation modeling (SEM). The CFA was utilized to evaluate a proposed theory. The "CFA" was guided by pre-existing theoretical assumptions and the "EFA" concerning the optimal number of factors and the most suitable factor theories or models. while Structural models are used to evaluate the hypothesized relationships between constructs in a proposed model. In order to conduct a structural equation modeling (SEM) analysis on the data collected from patients for the current study, the author followed Hair et al.'s (2019) six-step methodology. Step 1: Defining individual constructs Step 2: Developing the overall measurement model Step 3: Designing a study to produce empirical results Step 4: Assessing the measurement model's validity Step 5: Specifying the structural model Step 6: Evaluating the structural model's fit indices

Stage 1: Defining Individual Constructs: A sound measurement theory is a prerequisite for deriving meaningful outcomes from Structural Equation Modeling (SEM). The reliability and validity of hypotheses tests that pertain to the structural relationships among constructs are contingent upon the measurement model's ability to elucidate the process by which these constructs are formed. Academic: Scholars frequently possess a variety of established scales at their disposal, each exhibiting slight variations from one another. In certain circumstances, the researcher encounters a dearth of a pre-existing scale and is required to devise a novel scale or make significant alterations to an extant scale to suit the novel context. The foundation of the entire SEM analysis is established by the researcher's selection of items to measure each construct in each case. It is imperative for the researcher to allocate a substantial amount of time and exertion in the initial stages of the research endeavor to ensure that the measurement quality is of a standard that would facilitate the drawing of solid and valid findings (Hair et al., 2019).

The present study developed a measurement tool through a comprehensive review of Public Value, acceptance technology, and eHealth literature. The present review offers a sound theoretical explication of the constructs under investigation, as expounded in Chapter 2. In the context of survey research, the process of operationalizing a latent construct involves the creation of a set of scaled indicator items that conform to a standardized format, such as the

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Likert scale (Hair et al., 2019). The present study employs a 5-point Likert scale to achieve this objective.

Step 2: Developing The Overall Measurement Model: At this stage, it is essential for the researcher to carefully consider the combination of all distinct constructs in order to establish a comprehensive measurement model. The present study employed the one-factor congeneric measurement model and utilized confirmatory factor analysis. As per Dragovic (2004) research, there exist three separate measurement models: parallel, tau-equivalent, and congeneric. The findings indicate that the congeneric model showed greater superiority in comparison to the other two models. The study employed a one-factor congeneric measurement approach to assess each construct individually and subsequently utilized confirmatory factor analysis (CFA) to evaluate the adequacy of the model fit for each construct. Furthermore, it is noteworthy that every construct comprises a minimum of three indicators, thereby satisfying the criteria for an overidentified model, which denotes a model with a greater number of distinct covariance and variance terms than parameters requiring estimation (Hair et al., 2019).

Regarding the CFA, the nature of the association between the indicators and the latent construct can either be formative or reflective (Freeze & Raschke, 2007). Reflective measurement models are widely employed in the social sciences as the primary measurement theory. Common constructs in social science, including personality, individual traits, work-related traits, and behavioral intentions, are reflective measures. Therefore, the current study employed the reflective measurement model (Hair et al., 2019). Following is a discussion of the initial measurement models for each construct measure.

3.7.1. Exogenous Variables in Patients' Value Model (PVM)

The study examined seven exogenous factors, namely patients' empowerment, eHealth justice, privacy concerns, perceived usefulness, social influence, quality of eHealth delivery, and perceived benefits. The aforementioned constructs were identified as imperative prerequisites for attaining the sub-dimensions of public value among patients who utilize eHealth applications.

Table 17 displays that the exogenous constructs' initial measurement model (generic model) demonstrated adequate levels and a suitable fit based on the indicators. However, the findings pointed out the potential for improving the model through modifications in order to achieve optimal fitting. In order to enhance the model fitting, two statistics, namely the modification index (MI) and standardized residual covariance, can be employed in making adjustments to a generic model, as suggested by Whittaker (2012). The researchers utilized standardized residual covariance and modification indices (MI) in order to improve the fit of the model. Upon modification, the revised model, as depicted in Figure 36, shows enhanced model fit indices, as presented in Table 16.

Typically, it is recommended that the factor loading of a variable should not fall below 0.5 in order to be considered significant (Dell'Olio et al., 2018; Hair et al., 2019). Additionally, the T value should be within the range of ±1.96 with a P-value that does not exceed 0.05 (Byrne, 2013). The results indicate that the standardized loading estimates surpassed the 0.5 threshold, and all the critical ratios (t-values) were statistically significant at a level of $p < 0.001$ and fell within the range of ±1.96 (see table 16).

Table 16. Parameter estimates and regression weights for exogenous variables of patients' value model.

Models			Generic Model				Revised Model			
Indicators			SRW*	URW*	SE*	T value /p *	SRW *	URW *	SE *	T value /p *
EP1	<--	PE	0.906	1			0.889	0.971	0.048	20.392*
EP2	<--	PE	0.902	0.935	0.044	21.157*	0.911	0.946	0.043	21.755*

EP12	<--	PE	0.904	0.983	0.046	21.303*	0.909	1		
EP11	<--	PE	0.877	0.953	0.048	19.677*	0.877	0.954	0.048	19.723*
EP13	<--	PE	0.853	0.922	0.05	18.446*	0.862	0.934	0.049	18.958*
EP10	<--	PE	0.829	0.812	0.047	17.328*	0.805	0.788	0.048	16.259*
HJ1	<--	HJ	0.887	1			0.836	0.959	0.059	16.165*
HJ4	<--	HJ	0.864	0.916	0.053	17.273*	0.900	1		
HJ6	<--	HJ	0.819	0.871	0.056	15.648*	0.827	0.91	0.057	15.88*
HJ2	<--	HJ	0.790	0.861	0.059	14.673*	0.726	0.814	0.065	12.62*
HJ3	<--	HJ	0.774	0.875	0.062	14.176*	0.793	0.928	0.063	14.763*
PC3	<--	PC	0.856	1			0.881	1		
PC2	<--	PC	0.797	0.808	0.063	12.886*	0.809	0.797	0.062	12.925*
PC4	<--	PC	0.773	0.74	0.06	12.432*	0.733	0.681	0.059	11.524*
PC1	<--	PC	0.665	0.647	0.063	10.267*	0.611	0.578	0.063	9.127*
PU2	<--	PU	0.833	0.985	0.08	12.252*	0.906	1		
PU4	<--	PU	0.793	1			0.696	0.817	0.078	10.453*
PU1	<--	PU	0.749	0.905	0.082	11.052*	0.644	0.724	0.076	9.523*
PU3	<--	PU	0.723	0.863	0.081	10.628*	0.765	0.852	0.073	11.6*
PB2	<--	PB	0.844	1			0.845	1		
PB1	<--	PB	0.818	0.849	0.069	12.256*	0.817	0.847	0.069	12.243*
PB3	<--	PB	0.760	0.829	0.072	11.529*	0.759	0.827	0.072	11.511*
SI3	<--	SI	0.916	1			0.919	1		
SI2	<--	SI	0.810	0.831	0.067	12.467*	0.808	0.826	0.066	12.473*
SI1	<--	SI	0.667	0.636	0.062	10.254*	0.666	0.633	0.062	10.247*
QHD2	<--	QHD	0.753	0.868	0.066	13.232*	0.752	0.868	0.066	13.219*
QHD1	<--	QHD	0.950	1			0.950	1		
QHD3	<--	QHD	0.829	0.813	0.054	15.125*	0.829	0.814	0.054	15.108*

Source: Author.

***Note*: *P value <0.001; EP: Patients empowerment; HJ: eHealth justice; PC: Privacy Concerns; PU: Perceived usefulness; SI: Social influence; QHD: Quality of eHealth delivery; PB: Perceived benefits; SRW=Standardized Regression Weights, URW= Unstandardized Regression Weights, S.E.= Standard Error.**

Table 17. Models fitness indices for exogenous variables in patients' value model.

Models	x2	DF	x2/DF	CFI*	SRMR*	RMSEA*	P value
Generic model	586.995	329	1.784	0.933	0.059	0.61	0.016
Interpretation	-----	----	Excellent	Acceptable	Excellent	Acceptable	Acceptable
Revised Model	513.571	326	1.575	0.951	0.071	0.052	0.353
Interpretation	-----	----	Excellent	Excellent	Excellent	Excellent	Excellent
Threshold*			Between 1 and 3	>0.90	<0.08	<0.08	>0.05

Source: Own elaboration adapted from Gaskin and Lim (2017) and Crawford and Kelder (2019).

***Note*: * CFI= Comparative Fit Index; RMSEA= Root Mean Square Error of Approximation; SRMR= Standardized Root Mean Square Residual.**

The path diagram was utilized to examine the verification of modification indices (MIs) for indicators that exhibited high correlation, with the aim of refining the generic model and attaining an improved-fit model. The model was revised using MI to account for the correlation among measurement errors, as depicted in the Figure 37. Given that the factor loading exhibited a positive value, none of the indicators were excluded from the measurement model prior to its revision. Furthermore, it is noteworthy that all of the factor loadings surpassed the predetermined threshold of .50 (Dell'Olio et al., 2018; Hair et al., 2019).

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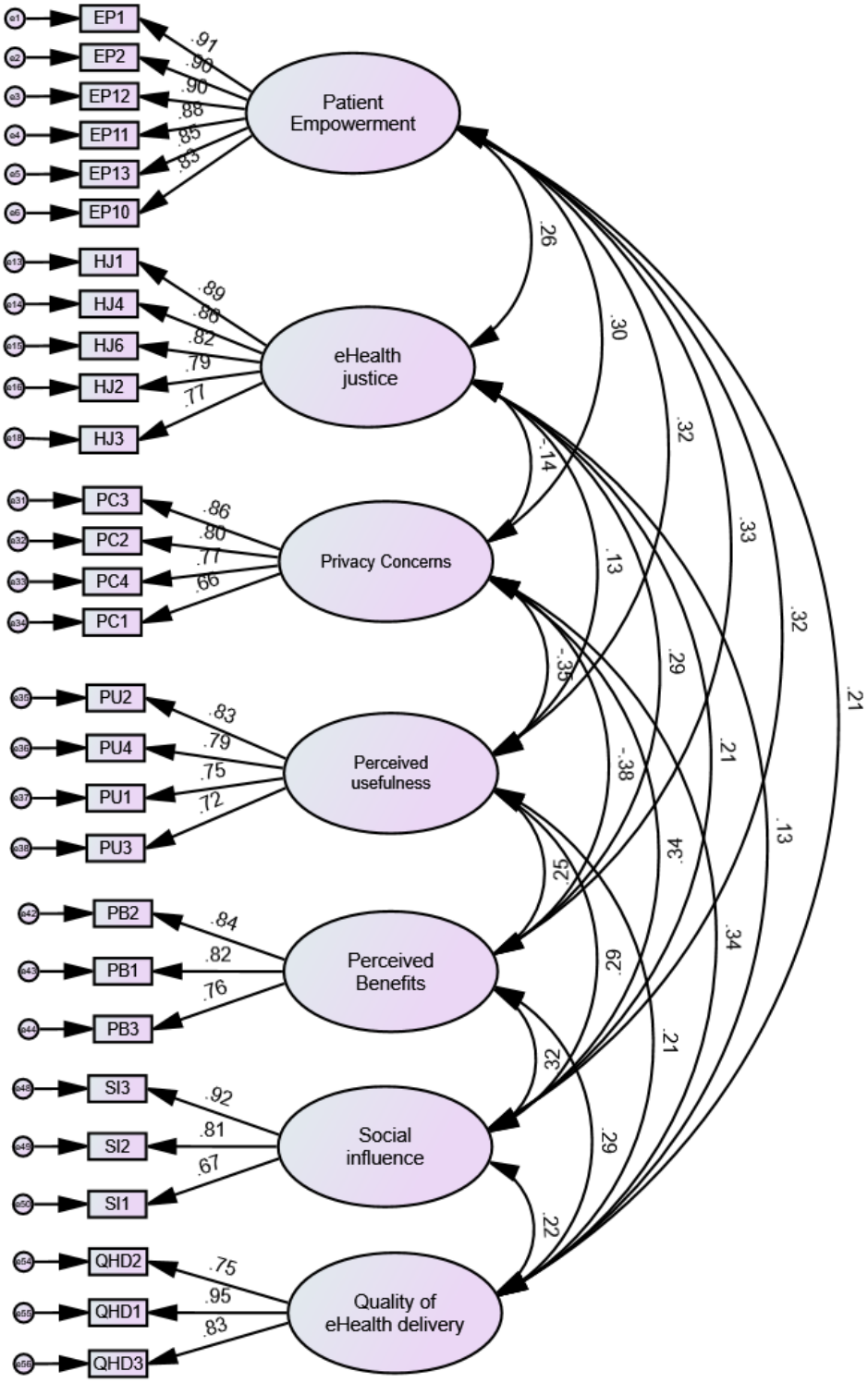

Figure 36. Generic measurement model of exogenous constructs.
Source: Author.

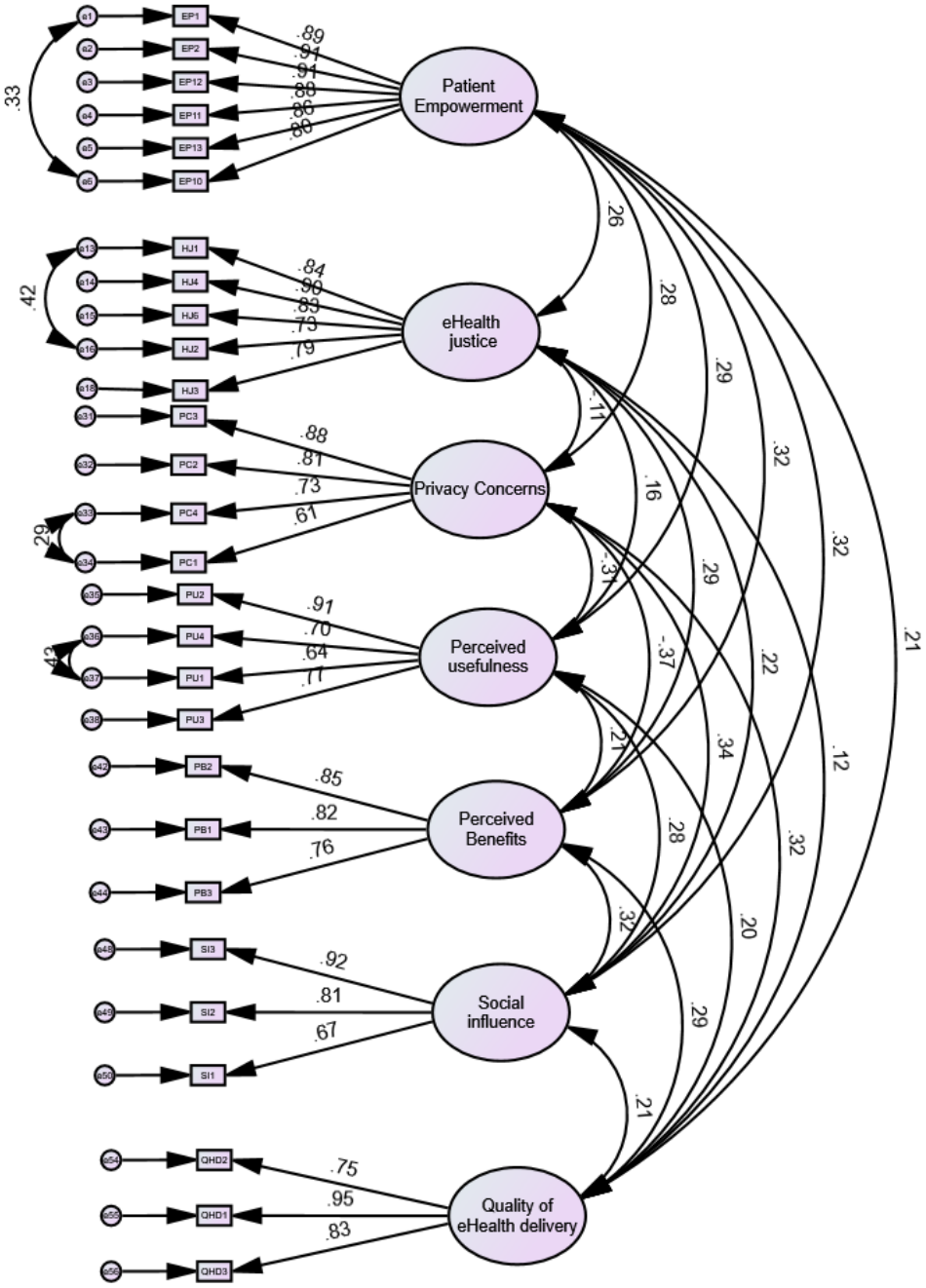

Figure 37. Revised measurement model of exogenous constructs.
Source: Author.

3.7.2. Patients' Value Model (Patients' Organism)

The patients' public value construct comprised 17 items and represented five sub-dimensions (Figure 38). These sub-dimensions were hedonistic motivation, utilitarian motivation, social value, public trust value, and ethical public value. Acceptable values were reached by the initial one-factor congeneric measurement model indicators for the total patients' public value construct, and a good fit was found. On the other hand, the findings highlighted that there is scope for enhancing the model by applying adjustments to obtain optimal fitting. The researcher used modification indices, also known as MI, to increase how well the model fits the data. As a result of the modifications made, the new model, seen in Figure 39, demonstrates improved model fit indices, which can be found in Table 19.

In general, the factor loading of a variable should not be less than 0.5 in order to be considered significant (Dell'Olio et al., 2018; Hair et al., 2019). Furthermore, the T value should be in the 1.96 range, with a P-value no greater than 0.05 (Byrne, 2013). The results show that the standardized loading estimates above the 0.5 threshold, and all of the crucial ratios (t-values) were statistically significant at the p 0.001 level and fell within the range of 1.96 (see Table 18).

Table 18. Parameter estimates and regression weights for endogenous variables.

Models			Generic Model				Revised Model			
Indicators			SRW*	URW*	SE*	T value /p *	SRW *	URW *	SE *	T value /p *
UM3	<--	UM	0.859	1			0.858	1		
UM2	<--	UM	0.800	0.83	0.059	13.982*	0.800	0.831	0.059	13.976*
UM4	<--	UM	0.858	0.859	0.055	15.534*	0.859	0.86	0.055	15.517*
UM1	<--	UM	0.791	0.752	0.055	13.745*	0.791	0.753	0.055	13.74*
PTV2	<--	PTV	0.869	0.953	0.062	15.362*	0.801	0.96	0.062	15.425*
PTV3	<--	PTV	0.852	1			0.779	1		
PTV4	<--	PTV	0.790	0.855	0.063	13.463*	0.825	0.976	0.084	11.646*
PTV1	<--	PTV	0.726	0.778	0.065	11.947*	0.769	0.902	0.082	10.989*
EPV3	<--	EPV	0.842	0.813	0.054	14.932*	0.842	0.814	0.054	14.934*
EPV1	<--	EPV	0.887	1			0.886	1		
EPV2	<--	EPV	0.792	0.801	0.058	13.772*	0.793	0.802	0.058	13.786*
HM1	<--	HM	0.863	1			0.865	1		
HM3	<--	HM	0.785	0.752	0.057	13.093*	0.787	0.752	0.057	13.131*
HM2	<--	HM	0.832	0.911	0.065	14.063*	0.829	0.907	0.065	14.01*
SV3	<--	SV	0.938	1			0.938	1		
SV2	<--	SV	0.801	0.805	0.056	14.389*	0.801	0.805	0.056	14.396*
SV1	<--	SV	0.743	0.722	0.056	12.915*	0.743	0.723	0.056	12.925*

Source: Author.

***Note*: *P value <0.001; UM: Utilitarian motivation; PTV: Public Trust Value; SV: Social value; HM: Hedonistic motivation; EPV: Ethical public value; #SRW=Standardized Regression Weights, URW= Unstandardized Regression Weights, S.E.= Standard Error.**

Table 19. Models Fitness Indices for endogenous variables in patients' public value.

Models	x^2	DF	x^2/DF	CFI*	SRMR*	RMSEA*	P value*
Generic model	215.526	109	1.977	0.955	0.058	0.068	0.017
Interpretation	-----	----	Excellent	Excellent	Excellent	Acceptable	Acceptable
Revised Model	200.630	108	1.858	0.961	0.052	0.063	0.056
Interpretation	-----	----	Excellent	Excellent	Excellent	Acceptable	Excellent
Threshold*			Between 1 and 3	>0.90	<0.08	<0.08	>0.05

Source: Own elaboration adapted from Gaskin and Lim (2017) and Crawford and Kelder (2019).

***Note:* * CFI= Comparative Fit Index; RMSEA= Root Mean Square Error of Approximation; SRMR= Standardized Root Mean Square Residual.**

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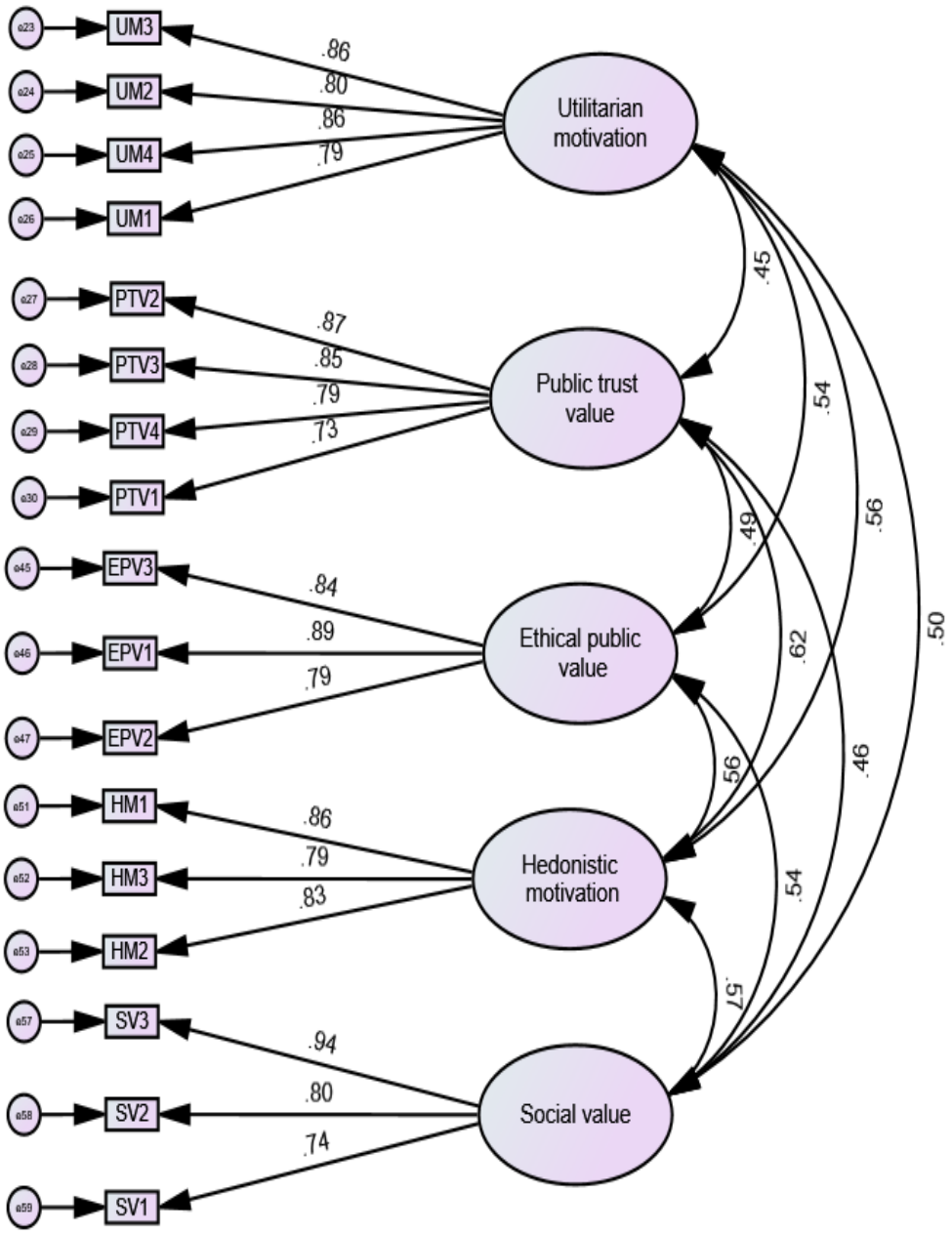

Figure 38. Generic measurement model of endogenous constructs.
Source: Author.

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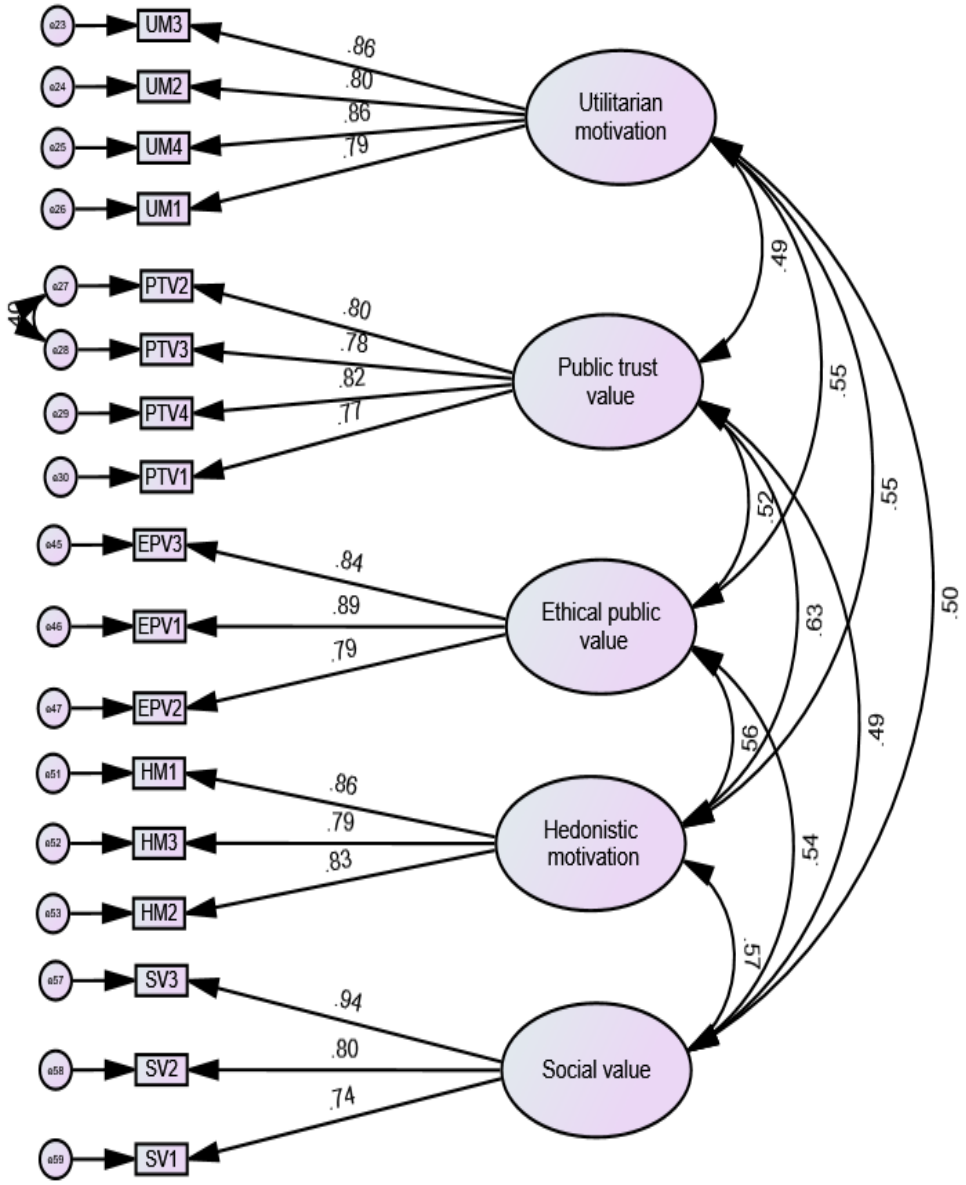

Figure 39. Revised measurement model of endogenous constructs.
Source: Author.

3.7.3. Endogenous in Patients' Value Model (Patients' Response)

In the patients' value model (PPV), the third layer, which represents patients' responses, needed to be modified to fit better with the data. This is because the cut-off range for multiple fit indices needed to be more appropriate, as shown in Table 21. These findings indicate that the model did not accurately represent the data and required modification to achieve the best fit. AMOS provides two types of information, standardized residuals, and modification indices, which can be used to identify model misspecification. Standardized residual covariance and modification indices (MI) were used to improve the model fit.

The researcher discovered that the high standardized residual covariance between IMI6, IMI4, IMI3, and IMI1 was primarily responsible for the poor fit of the patients' response layer. Consequently, the researcher conducted iterations for error variance terms for items (IMI6, IMI4, IMI3, and IMI1). These results confirmed that the model attained acceptable levels and a decent fit. Figures 40 and 41 illustrate the CFA model during the initial and final iterations, respectively. Table 21 details the iteration and its respective model fit indices.

Table 20. Parameter estimates and regression weights for endogenous variables (patients' response).

Models			Generic Model				Revised Model			
Indicators			SRW #	URW#	SE #	CR/p #	SRW #	URW#	SE#	CR/p#
IMI6	<--	IMI	0.939	0.949	0.032	29.387*	0.941	0.946	0.032	29.447*
IMI4	<--	IMI	0.955	1			0.959	1		
IMI5	<--	IMI	0.900	0.842	0.034	24.784*	0.889	0.828	0.035	23.565*
IMI3	<--	IMI	0.897	0.935	0.038	24.487*	0.886	0.919	0.039	23.519*
IMI1	<--	IMI	0.863	0.87	0.04	21.552*	0.862	0.864	0.041	21.292*
IMI2	<--	IMI	0.848	0.854	0.042	20.48*	0.849	0.851	0.041	20.661*
HB1	<--	HB	0.939	1			0.939	1		
HB3	<--	HB	0.923	0.999	0.041	24.401*	0.923	0.999	0.041	24.399*
HB4	<--	HB	0.865	0.94	0.046	20.254*	0.865	0.94	0.046	20.252*
HB2	<--	HB	0.838	0.849	0.045	18.686*	0.838	0.849	0.045	18.688*
UB3	<--	UB	0.788	0.99	0.066	14.935*	0.788	0.99	0.066	14.936*
UB1	<--	UB	0.899	0.947	0.051	18.440*	0.899	0.947	0.051	18.439*
UB2	<--	UB	0.918	1			0.918	1		

Source: Author.

Note: *** P value <0.001; IMI: Implementation intention; HB: Habit; UB: Use behavior; #SRW=Standardized Regression Weights, URW= Unstandardized Regression Weights, S.E.= Standard Error, CR= Critical Ratio.**

The statistical analysis of the regression parameter estimates for the generic and revised models of the patients' public value (use behavior) scale revealed that all of its items were statistically significant at a significance level of 0.001, as presented in Table (20). Furthermore, it is noteworthy that all the factor loadings surpassed the pre-established threshold of 0.50. All items were retained for the measurement model of the patients' response layer based on the obtained results.

Table 21. Models Fitness Indices for endogenous variables (patients' response) in patients' public value.

Models	x^2	DF	x^2/DF	CFI	SRMR	RMSEA	P Close
Generic model	157.179	62	2.535	0.967	0.032	0.085	0.000
Interpretation	-----	----	Excellent	Excellent	Excellent	Insufficient	Insufficient
Revised Model	104.070	59	1.764	0.984	0.030	0.060	0.190
Interpretation	-----	----	Excellent	Excellent	Excellent	Excellent	Excellent
Threshold*			Between 1 and 3	>0.90	<0.08	<0.08	>0.05

Source: Own elaboration adapted from Gaskin and Lim (2017) and Crawford and Kelder (2019).

Note: ***CFI= Comparative Fit Index; RMSEA= Root Mean Square Error of Approximation; SRMR= Standardized Root Mean Square Residual.**

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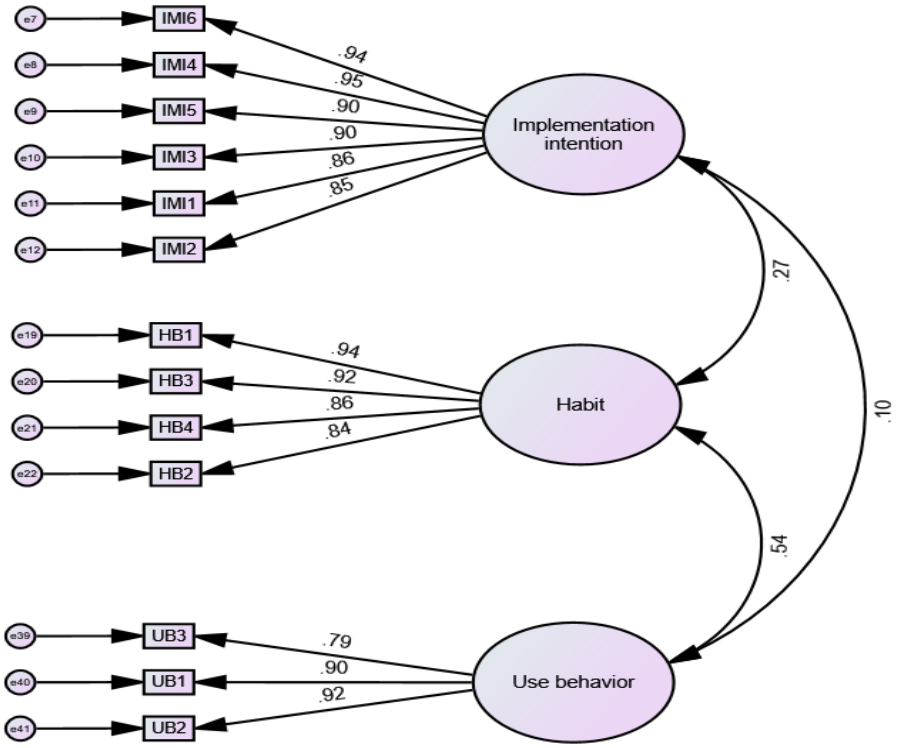

Figure 40. Generic measurement model of endogenous constructs for patients' response layer. Source: Author.

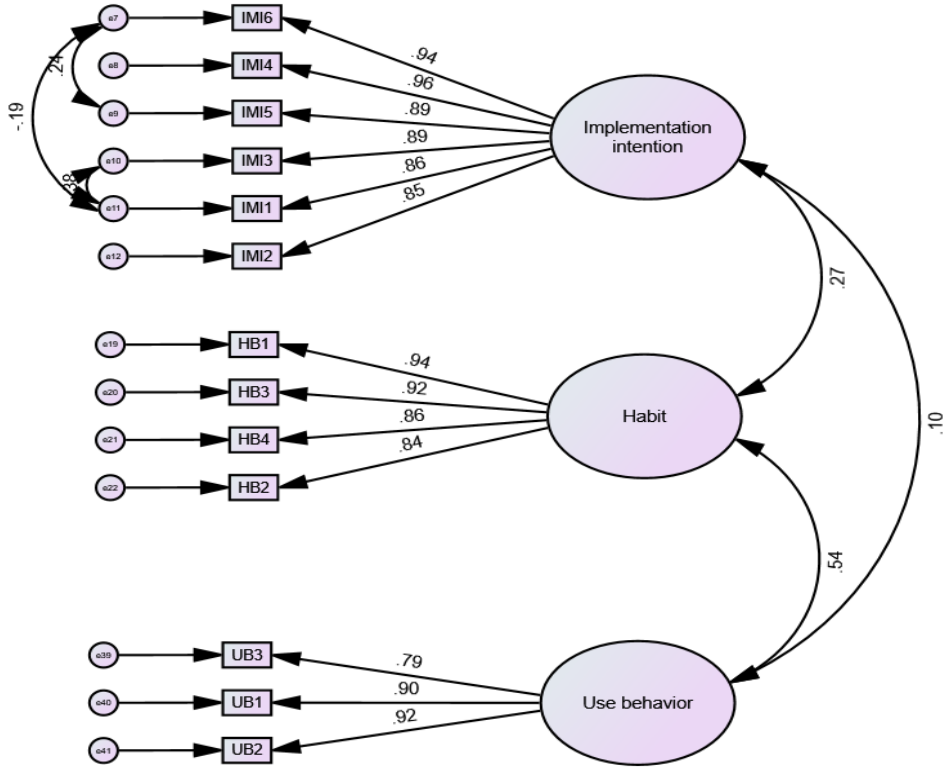

Figure 41. Revised measurement model of endogenous constructs for patients' response layer. Source: Author.

Stage 3: Designing Study to Produce Empirical Results: The third phase entails formulating a research plan that is aimed at generating results that validate the hypothesis. Stated differently, the evaluation of the researcher's measurement theory will be conducted.

The application of valid descriptive research necessitates adherence to established rules and procedures, such as conducting a multivariate normality test, detecting missing data, and identifying outliers, as outlined at the beginning of this chapter. Assuming successful implementation of the measurement model, the structural model is subsequently evaluated using the identical sample in a structural equation modeling (SEM) analysis. Following the completion of initial analyses, all constructs presented in the proposed model of this study have been evaluated in terms of individual measurement model fit. Several modification indices (MI) were utilized in this procedure. The goal was to create a suitable model. CFA can be used to represent the measurement model by integrating the exogenous and endogenous models into a single model. The purpose of establishing an overall measurement model fit was to evaluate the validity of the measurement model, which tested the covariance structures for all constructs.

Again, the present study employed a two-step approach: firstly, an in-depth assessment of the measurement model(s) to determine the degree of model-data fit, and secondly, an examination of the structural model, as outlined by Schumacker & Lomax (2004). The study employed the maximum likelihood (ML) estimation technique for the purpose of ensuring the convergent and discriminant validity of the constructs in the context of the CFA. The findings of the Confirmatory Factor Analysis (CFA) revealed that the measurement model demonstrated a good fit with the data ($\chi 2$ (1486) = 2238.098, $\chi 2$/df = 1.506, CFI = 0.922, SRMR =0.067, RMSEA = 0.049, and P value = 0.705). Furthermore, the goodness-of-fit indices related to the model constructs were found to be within the recommended threshold, as suggested by Gaskin and Lim (2016) and Hu and Bentler (1999). The findings suggest a high level of conformity between the model and the data, as illustrated in Table 23.

The findings presented in Table 22 reveal that the CFA results demonstrate factor loadings surpassing 0.5, and the critical ratio of regression weight (t-values) for each indicator surpasses the threshold range of ±1.96, indicating statistical significance (p<.001).

Table 22. Parameter estimates and regression weights for overall study model.

Items		Factors	SRW	URW	S.E.	C.R.	P
EP1	<---	Patient Empowerment	0.889	0.972	0.048	20.369	***
EP2	<---	Patient Empowerment	0.911	0.947	0.044	21.725	***
EP12	<---	Patient Empowerment	0.908	1			
EP11	<---	Patient Empowerment	0.877	0.956	0.048	19.742	***
EP13	<---	Patient Empowerment	0.863	0.935	0.049	18.966	***
EP10	<---	Patient Empowerment	0.805	0.788	0.049	16.248	***
IMI6	<---	Implementation intention	0.947	0.955	0.031	30.917	***
IMI4	<---	Implementation intention	0.957	1			
IMI5	<---	Implementation intention	0.906	0.844	0.033	25.502	***
IMI3	<---	Implementation intention	0.886	0.919	0.039	23.565	***
IMI1	<---	Implementation intention	0.849	0.852	0.041	20.657	***
IMI2	<---	Implementation intention	0.851	0.853	0.041	20.796	***
HJ1	<---	eHealth justice	0.837	0.963	0.059	16.22	***
HJ4	<---	eHealth justice	0.896	1			
HJ6	<---	eHealth justice	0.831	0.919	0.057	16.063	***
HJ2	<---	eHealth justice	0.721	0.811	0.065	12.509	***
HJ3	<---	eHealth justice	0.794	0.933	0.063	14.83	***
HB1	<---	Habit	0.939	0.999	0.04	24.813	***
HB3	<---	Habit	0.926	1			
HB4	<---	Habit	0.870	0.943	0.047	20.06	***
HB2	<---	Habit	0.842	0.85	0.046	18.519	***
UM3	<---	Utilitarian motivation	0.863	1			

UM2	<---	Utilitarian motivation	0.800	0.825	0.058	14.212	***
UM4	<---	Utilitarian motivation	0.866	0.862	0.054	16.082	***
UM1	<---	Utilitarian motivation	0.789	0.745	0.054	13.889	***
PTV2	<---	Public Trust Value	0.871	0.947	0.06	15.78	***
PTV3	<---	Public Trust Value	0.858	1			
PTV4	<---	Public Trust Value	0.794	0.852	0.062	13.806	***
PTV1	<---	Public Trust Value	0.725	0.769	0.064	12.088	***
PC3	<---	Privacy Concerns	0.872	1			
PC2	<---	Privacy Concerns	0.811	0.808	0.062	12.983	***
PC4	<---	Privacy Concerns	0.741	0.696	0.06	11.657	***
PC1	<---	Privacy Concerns	0.619	0.591	0.064	9.244	***
PU2	<---	Perceived usefulness	0.914	1			
PU4	<---	Perceived usefulness	0.682	0.792	0.075	10.513	***
PU1	<---	Perceived usefulness	0.637	0.709	0.073	9.656	***
PU3	<---	Perceived usefulness	0.767	0.845	0.07	12.076	***
UB3	<---	Use behavior	0.789	0.978	0.064	15.311	***
UB1	<---	Use behavior	0.900	0.939	0.048	19.488	***
UB2	<---	Use behavior	0.926	1			
PB2	<---	Perceived benefits	0.843	1			
PB1	<---	Perceived benefits	0.815	0.846	0.068	12.37	***
PB3	<---	Perceived benefits	0.764	0.835	0.071	11.683	***
EPV3	<---	Ethical public value	0.848	0.82	0.054	15.273	***
EPV1	<---	Ethical public value	0.885	1			
EPV2	<---	Ethical public value	0.797	0.806	0.058	14.017	***
SI3	<---	Social influence	0.909	1			
SI2	<---	Social influence	0.812	0.839	0.066	12.638	***
SI1	<---	Social influence	0.676	0.649	0.062	10.46	***
HM1	<---	Hedonistic motivation	0.863	1			
HM3	<---	Hedonistic motivation	0.792	0.757	0.056	13.454	***
HM2	<---	Hedonistic motivation	0.838	0.918	0.063	14.511	***
QHD2	<---	Quality	0.751	0.871	0.066	13.28	***
QHD1	<---	Quality	0.945	1			
QHD3	<---	Quality	0.836	0.824	0.053	15.438	***
SV3	<---	Social value	0.942	1			
SV2	<---	Social value	0.805	0.802	0.053	15.051	***
SV1	<---	Social value	0.746	0.718	0.054	13.348	***

Source: Author.

Note: ***** P value <0.001; IMI: Implementation intention; HB: Habit; UB: Use behavior; #SRW=Standardized Regression Weights, URW= Unstandardized Regression Weights, S.E.= Standard Error, CR= Critical Ratio.**

Table 23. Models Fitness Indices for overall study model.

Measure	Estimate	Threshold	Interpretation
x^2	2238.098	--	--
DF	1486.000	--	--
x^2/DF	1.506	Between 1 and 3	Excellent
CFI	0.922	>0.90	Acceptable
SRMR	0.067	<0.08	Excellent
RMSEA	0.049	<0.06	Excellent
P value	0.705	>0.05	Excellent

Source: Own elaboration adapted from Gaskin and Lim (2017) and Crawford and Kelder (2019).

Note: ***CFI= Comparative Fit Index; RMSEA= Root Mean Square Error of Approximation; SRMR= Standardized Root Mean Square Residual.**

The modification indices (MIs) were used to verify highly correlated indicators for a better-fit model of endogenous and exogenous variables. This is shown in the path diagram. The use of MI allowed for the correlation of measurement errors, as seen in Figure 42. The measurement model was revised without removing any indicators because the factor loading had a positive value. Additionally, none of the factor loadings fell below the preset minimum value of 0.50. Based on these findings, it was decided to keep all components while developing the measuring model for the patient public value scale.

The revised measurement model for the endogenous and exogenous variables "patient empowerment, eHealth justice; implementation intention; privacy concerns; habit; utilitarian motivation; perceived usefulness; public trust value; social value; hedonistic motivation; social influence; ethical public value; quality of eHealth delivery; perceived benefits; use behavior" is also depicted in the Figure (42). The figure shows that there were 15 factors that were measured by a total of 58 items.

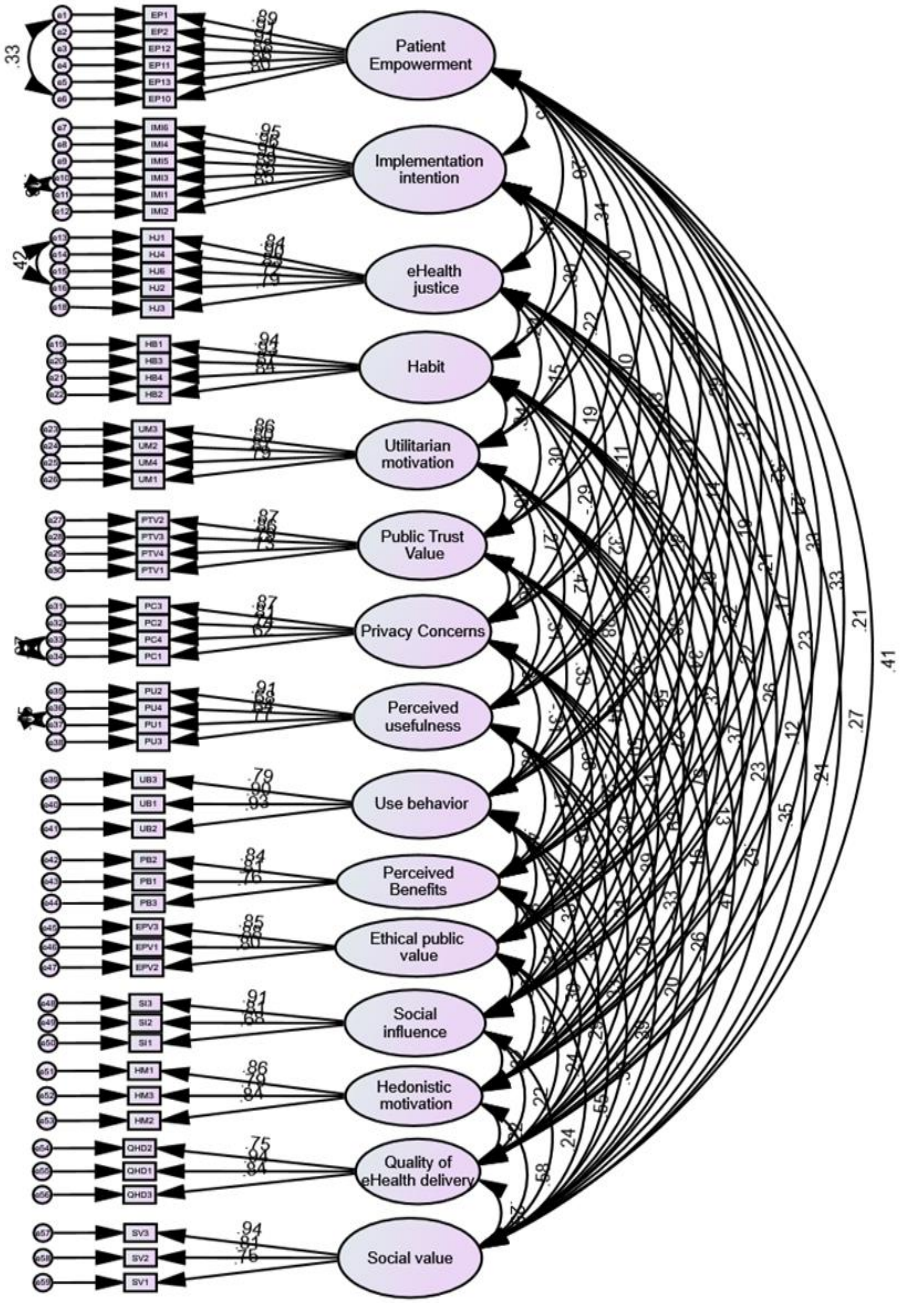

Figure 42. First-order of measurement model of overall study model. Source: Author.

Stage 4: Assessing the Measurement Model's Validity: After specification of the measurement model, collecting adequate data, and determining critical decisions such as the estimation technique, the researcher faces the essential question in SEM testing: "Does the measurement model demonstrate validity?" The validity of a measurement model is dependent upon two factors: firstly, the finding of acceptable levels of goodness-of-fit for the measurement model, also known as fit validity (it was found in the previous section), and secondly, the identification of additional evidence related to construct validity (Hair et al., 2019).

Before continuing to check the construct validity of the study's model, it is necessary to know that a rigorous method is an important aspect of the editors' and reviewers' assessments of any manuscript to ensure more trustworthy findings. This is something that should be known before continuing to examine the construct validity of the study's model. However, attaining such rigor is not always as simple as it may seem. Consequently, one phenomenon known as common method bias (CMB) is capable of having an impact on the level of rigor of research (Jordan & Troth, 2019). In the subsequent phase, the researcher conducted a common method bias (CMB) evaluation to ensure that the present study adhered to a rigorous methodology in arriving at its findings.

3.8. COMMON METHOD BIAS

Self-administered surveys are a prevalent method of data collection employed in research. Questionnaire-based studies typically operationalize variables of interest by utilizing a set of items that comprise either an established or newly created scale. Surveys are a frequently employed technique in the field of social sciences; however, they carry the potential for common method variance and common method bias, which may have an impact on the dependability and accuracy of the empirical findings.

The two aforementioned terminologies are frequently utilized in literature and often used interchangeably, notwithstanding their different conceptual underpinnings. The term "common method variance" refers to a type of variance that arises from a systematic error in measurement resulting from the use of a single method to measure the constructs under investigation in a study. The presence of common method bias can be inferred when the relationship between the measured variables is influenced by common method variance. The label common method bias (CMB) will be utilized for the sake of simplicity (Kock et al., 2021). The phenomenon of common method bias (CMB) arises in survey research when all variables, including independent, dependent, mediating, and moderating variables, are measured using the same method (same questionnaire). This may lead to an artificial inflation of relationships between the variables (Jordan & Troth, 2019). It can also undermine the validity of a study (Kock et al., 2021).

Given that this study evaluates the independent, mediating, and dependent variables simultaneously using a single tool and at a single point in time, it is possible that common method variance (CMV) may be present. Various approaches exist for detecting common method bias (CMB) (Jordan & Troth, 2019).

The current study employed statistical techniques, specifically the confirmatory factor analysis (CFA) marker approach, to identify the presence of common method bias (CMB) in the responses of patients. The researcher's utilization of the CFA marker was based on several considerations. Firstly, the CFA marker technique has demonstrated a reasonable ability to detect the presence of CMV(Miller & Simmering, 2022; Simmering et al., 2015). Secondly, the current study was designed using SEM, and the CFA marker was deemed suitable for this design (Williams et al., 2010). Lastly, other statistical strategies, such as Harman's single-factor test, were found to be insensitive(S.-J. Chang et al., 2010). Therefore, as a preventative measure to reduce the potential risk of CMV, the author incorporated a "marker variable" within his survey questionnaire (Miller & Simmering, 2022).

As per the guidelines established by Simmering et al. (2015), the selection of "blue marker" as a marker variable for the present study was based on its absence of theoretical association with other variables under investigation. Additionally, the variable showed the lowest correlation with other variables, as evidenced by Figure 43. Moreover, the items related to the blue marker utilized in this study have been delineated at the end of the study's questionnaire (see Appendix10).

This study conducted the CFA marker in accordance with the methodology proposed by Williams et al. (2010). he put forth a CFA-based marker technique consisting of three steps in order to detect and manage potential method biases. The quality of a marker variable is primarily determined by the extent to which it is affected by the same causes of CMB (e.g., blue marker) as the focal variables without being theoretically related to them. The current study performed the CFA marker through the following stages: Initially, a Confirmatory Factor Analysis (CFA) was conducted using a marker. The results, as illustrated in Figure 43, indicate that the blue attitude marker exhibited low correlation coefficients within the range of 0.00-0.19. The baseline model was constructed by imposing a constraint of zero covariance between the blue marker factor and the remaining factors in the model (see Figure 44).

Furthermore, it was demonstrated that there was no alteration in the fit indices of the model. The third point to consider is that the Method-C model incorporates a 58 arrow originating from the blue marker and imposes consistent factor loadings on the model's items (see Figure 45). In the ultimate phase, the baseline model and Method-C model were compared to examine the null hypothesis that the method factor loadings, which were assumed to be equivalent, linked to the marker variable, were not associated with any of the 58 substantive indicators. The results of the chi-square difference test suggest that the common method bias can be rejected. The study reveals that the comparison results in a chi-square difference of 1.283 with a single degree of freedom; as presented in Table 24, this value surpasses the significance level of 0.05. Therefore, there is no common method variance (CMV) issue with the data (Haneem et al., 2019).

Table 24. Model Fit Indices and Model Comparisons for CFA Models with Marker Variable.

Model	χ^2 (df)	CFI	RMESA 90 CI	LR of $\Delta\chi^2$	Model comparison	Decisions
CFA with marker	2524.991 (1705)	0.920	0.047 (0.043-0.051)			
Baseline	2544.383 (1728)	0.920	0.047 (0.043-0.051)			
Model-C	2543.100 (1727)	0.920	0.047 (0.043-0.051)	1.283; df=1; P=0.257 (NS)	vs Baseline	No method bias founded
Model-U	2531.405 (1671)	0.916	0.049 (0.045-0.053)	12.978; df=58; P= 1.000 (NS)	vs. Method-C	CMV same for all indicators
Model-R	2453.409 (1774)	0.934	0.042 (0.038-0.046)	77.996; df= 105; P= 0.978 (NS)	vs. Method-U	CMV doesn't skew relationship between IVs

Source: Author.

***Note*: * NS= Not significant; CFA =Confirmatory factor analysis; CFI= Comparative Fit Index; RMSEA= Root Mean Square Error of Approximation; LR= Likelihood Ratio Test; C = Common; U= Unconstrained; R= restricted; CMV= Common method variance.**

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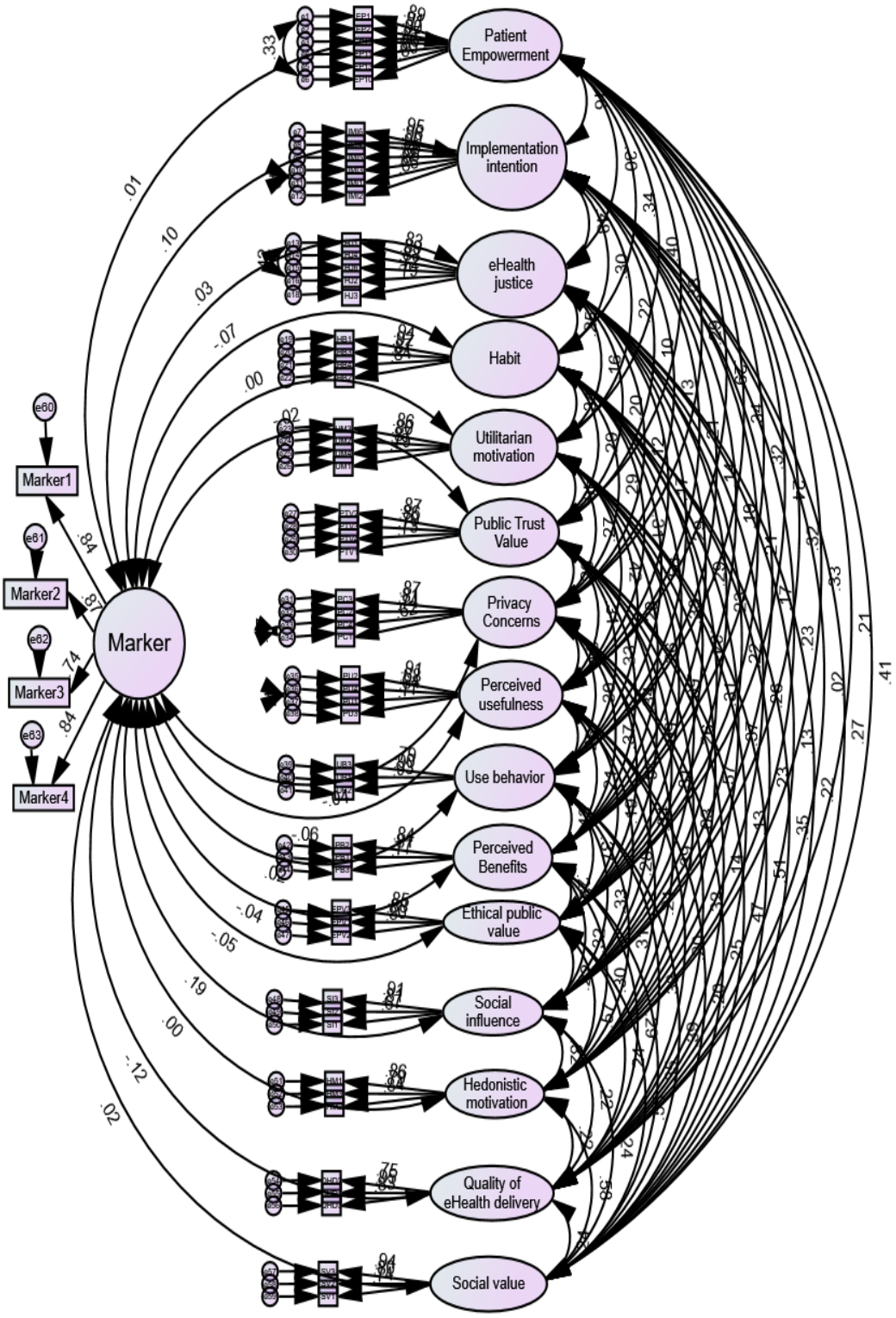

Figure 43. CFA with blue color attitude marker.
Source: Author.

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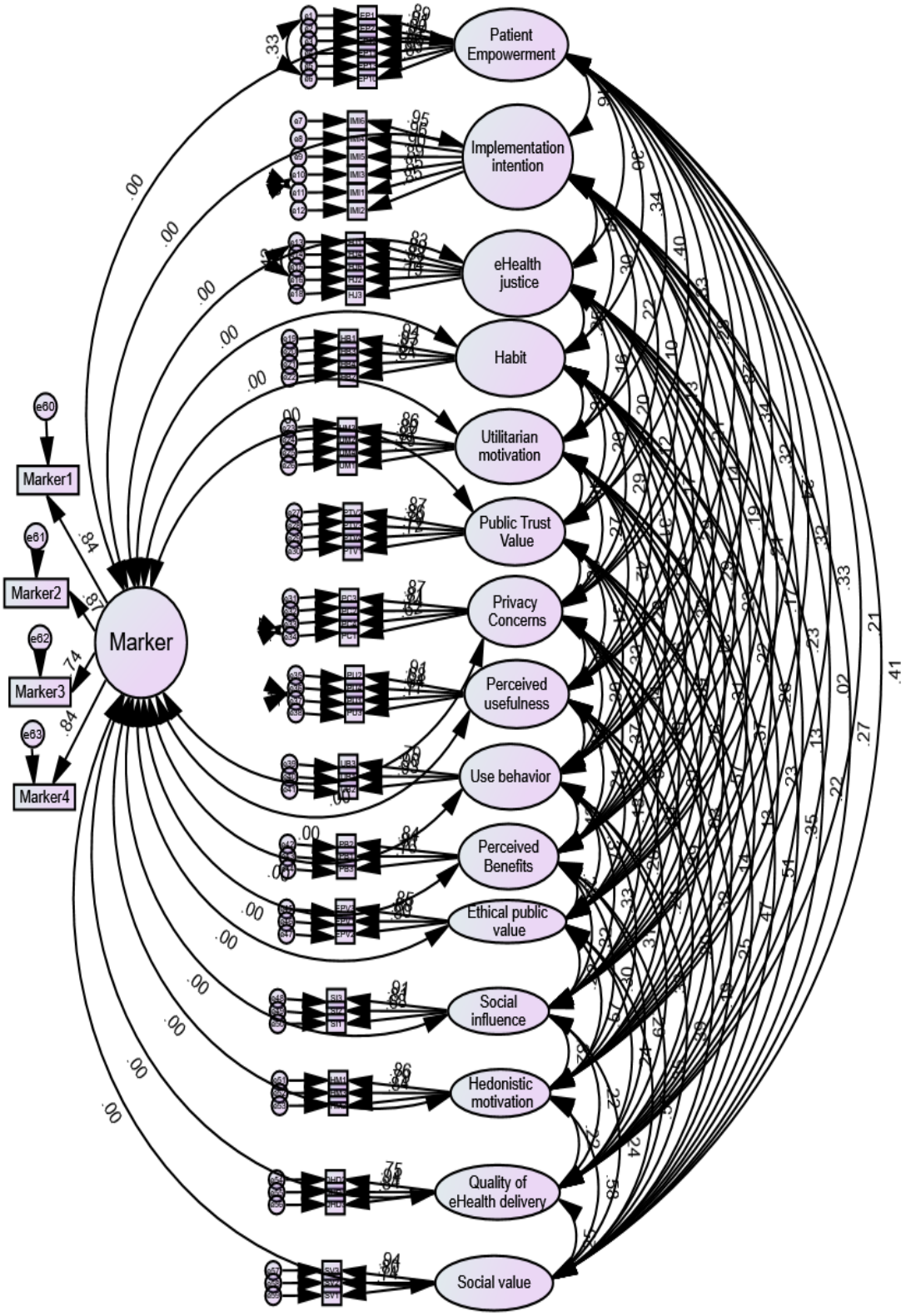

Figure 44. Baseline Model for CFA with marker.
Source: Author.

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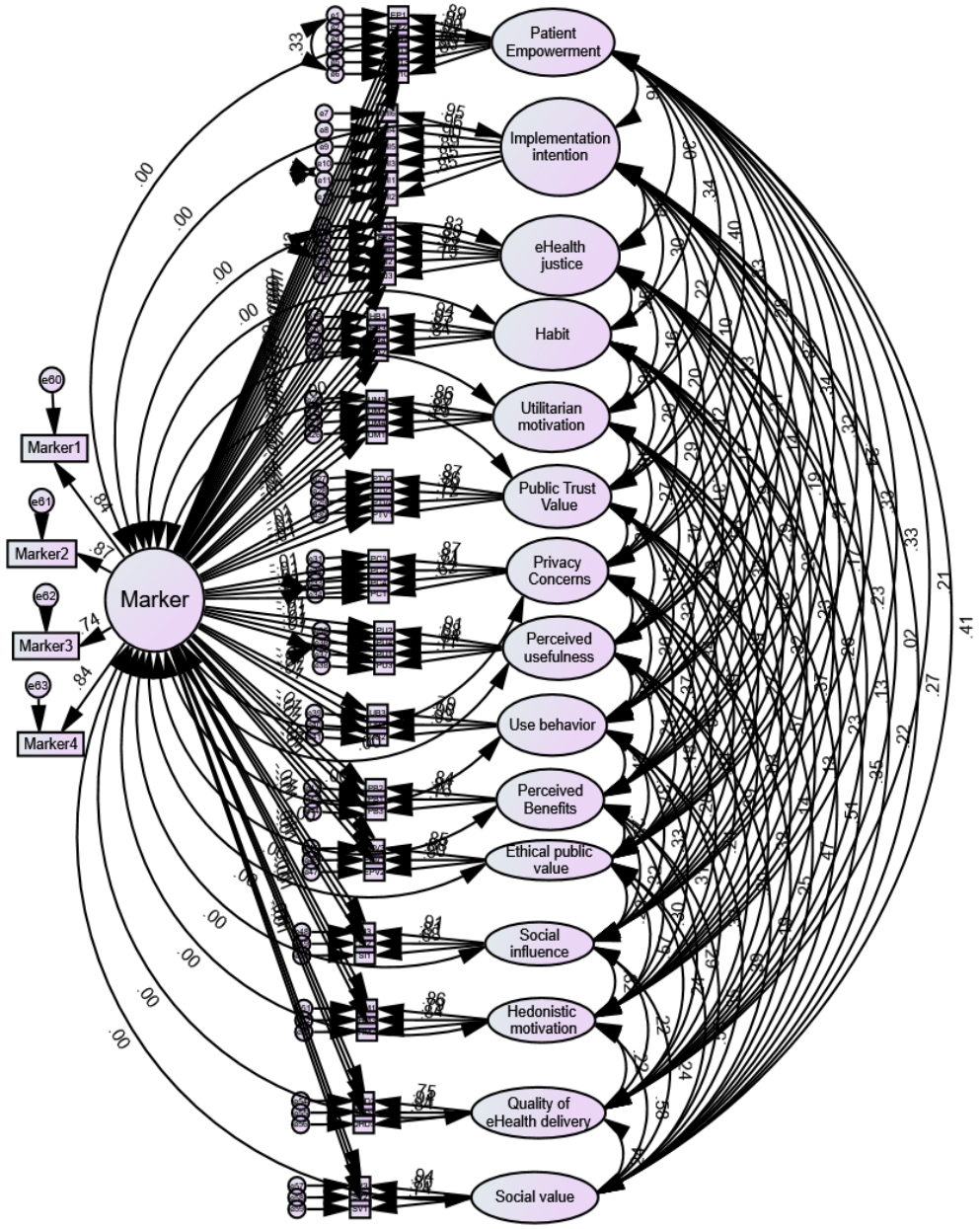

Figure 45. Constraint Model for CFA with marker.
Source: Author.

3.9. DISCRIMINANT, CONVERGENT VALIDITY, AND COMPOSITE RELIABILITY

The assessment of the measurement model's validity and reliability is a crucial step in the research process. The poor levels of reliability or validity of a measurement instrument can have adverse implications for the quality of data utilized in subsequent stages of the analysis process. It is essential to assess the reliability and validity of the measurement model in this context. The outcomes derived from the evaluation of the comprehensive measurement model were utilized as input to evaluate the reliability and validity of the suggested model (De et al., 2022; Mohajan, 2017). The present study utilized a total of four tests to evaluate the validity of the proposed model, namely Cronbach's Alpha; McDonald's Omega (Hair et al., 2019); composite reliability(Cheung et al., 2023; Field, 2013); and Maximal Reliability (Fu et al., 2018). Cronbach's alpha and McDonald's omega were evaluated during the exploratory factor analysis phase and were found to be within an acceptable range (refer to Table 14).

As shown in Table 25, composite reliability, and maximal reliability were tested during the CFA stage. Composite reliability is a statistical metric that evaluates the internal consistency reliability of a measurement instrument. Unlike Cronbach's alpha, composite reliability does not presume that the indicator loadings are equally weighted (Hair et al., 2019). According to Cheung et al. (2023)(Cheung et al., 2023), a composite reliability level of 0.70 is deemed acceptable. Table 25 displays the results of the composite reliability value for each proposed construct in this study. The results indicate that the range of construct reliability is between 0.962 and 0.841. All of these values were above the acceptable threshold, indicating a high level of reliability. In addition, maximal reliability (H) was utilized to evaluate reliability. The H coefficient is known as the maximal reliability H was evaluated as a method for estimating reliability using an optimally weighted composite with the standardized factor loadings as the weighting factors (Sideridis et al., 2018). The results in Table 25 show that all the constructs of model exceeded the acceptable level of 0.70 (Cheung et al., 2023)

In contrast, validity relates to the precision of measurements (Sekaran & Bougie, 2016). According to Zikmund's definition, validity relates to the capacity of a scale to accurately measure the intended construct (Al-Muwil et al., 2019). In relation to the assessment of validity, the proposed model of this study was evaluated using two tests: convergence validity and discriminant validity.

According to Cheung et al. (2023), convergence validity is a distinct situation in which indicators of a particular construct are projected to show high levels of correlation with one another and demonstrate a consistent pattern of intercorrelations. In addition, Hair et al. (2019) posited that convergent validity is a comprehensive measure of a reflective measurement model that gauges the degree to which the indicators of a construct converge, thus accounting for the variance of the items. The construct commonly known as communality is measured through the evaluation of the average variance extracted (AVE) from all indicators associated with it. The AVE is referred to as the average (mean) of the squared loadings of all indicators related to a specific construct. The general rule for an acceptable AVE is 0.50 or greater. This level or higher implies that the construct, on average, explains at least half of the variance of its indicators. As demonstrated in table 25, AVE for all model's constructs exceeded the acceptable level of 0.50 range between 0. 0.573 and 0.811. However, the discriminant validity of two measures designed to assess separate constructs is established when the measures exhibit a low correlation value, after adjusting for measurement error, indicating that they indeed measure distinct constructs (Rönkkö & Cho, 2020). In other words, discriminant validity is the degree to which a construct's indicators reflect a single construct and are different from the indicators of other constructs in the model (Hair et al., 2014).

There are multiple methods available to evaluate discriminant validity, but the predominant method involves utilizing the Fronell-Larcker criterion. This guideline states that in order to assess discriminant validity, the square root of the average variance extracted (√ AVE) for each construct must surpass its correlation with other constructs (Hair et al., 2014; Malhotra & Dash, 2011). Another additional approach for assessing discriminant validity used in this study involves comparing the average variance extracted (AVE) to the maximum shared squared variance (MSV). If the AVE exceeds the MSV, it indicates that discriminant validity has been established (Almén et al., 2018). Table 25 presents the results of the implementation of these techniques, which achieved a satisfactory level of discriminant validity. The heterotrait-monotrait (HTMT) ratio of correlation is an additional metric utilized to assess discriminant validity. The HTMT metric serves as an indicator of the degree of a similarity between unobserved constructs. According to Henseler et al. (2015), the establishment of discriminant validity can be inferred if the HTMT value is significantly less than 0.85. The table 26 indicates that none of the study factors surpass the HTMT0.85 criteria.

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Table 25. Discriminant, Convergent validity, and Composite Reliability.

Factors	CR*	AVE*	MSV*	MaxR(H)*	PE	IMI	HJ	HB	UM	PTV	PC	PU	UB	PB	EPV	SI	HM	QHD	SV
PE	0.952	0.768	0.167	0.955	0.876														
IMI	0.962	0.811	0.233	0.971	0.151	0.900													
HJ	0.910	0.669	0.233	0.920	0.265	0.483	0.818												
HB	0.942	0.802	0.313	0.950	0.345	0.299	0.242	0.895											
UM	0.899	0.689	0.325	0.903	0.404	0.220	0.147	0.344	0.830										
PTV	0.887	0.663	0.397	0.897	0.328	0.098	0.192	0.296	0.465	0.814									
PC	0.849	0.588	0.155	0.874	0.288	-0.131	-0.114	-0.288	-0.275	-0.261	0.767								
PU	0.841	0.573	0.177	0.890	0.287	0.211	0.160	0.315	0.421	0.309	-0.311	0.757							
UB	0.906	0.764	0.313	0.923	0.343	0.137	0.282	0.560	0.278	0.333	-0.305	0.255	0.874						
PB	0.849	0.653	0.188	0.854	0.321	0.189	0.291	0.335	0.263	0.338	-0.375	0.210	0.434	0.808					
EPV	0.881	0.713	0.323	0.888	0.243	0.208	0.224	0.343	0.557	0.501	-0.257	0.184	0.370	0.231	0.844				
SI	0.844	0.647	0.117	0.883	0.325	0.169	0.219	0.316	0.266	0.312	0.342	0.280	0.330	0.324	0.226	0.804			
HM	0.870	0.691	0.397	0.874	0.328	0.228	0.257	0.373	0.571	0.630	-0.394	0.214	0.313	0.298	0.569	0.318	0.831		
QHD	0.884	0.718	0.111	0.923	0.213	0.024	0.123	0.234	0.132	0.146	0.325	0.198	0.333	0.290	0.240	0.222	0.218	0.848	
SV	0.873	0.698	0.339	0.917	0.409	0.268	0.207	0.354	0.516	0.468	-0.257	0.196	0.388	0.352	0.547	0.242	0.583	0.246	0.835

Source: Author.

***Note*: *Composite Reliability (CR), Average Variance Extracted (AVE), Maximum Shared Variance (MSV). Shorts: EP: Patients empowerment; HJ: eHealth justice; IMI: Implementation intention; PC: Privacy Concerns; HB: Habit; UM: Utilitarian motivation; PU: Perceived usefulness; PTV: Public Trust Value; SV: Social value; HM: Hedonistic motivation; SI: Social influence; EPV: Ethical public value; QHD: Quality of eHealth delivery; PB: Perceived benefits; UB: Use behavior; Diagonal values show the Square Root of the AVE.**

Table 26. Discriminant validity using the heterotrait-monotrait (HTMT) test.

	PE	IMI	HJ	HB	UM	PTV	PC	PU	UB	PB	EPV	SI	HM	QHD	SV
PE															
IMI	0.06														
HJ	0.03	0.47													
HB	0.30	0.29	0.19												
UM	0.39	0.18	0.06	0.33											
PTV	0.29	0.08	0.12	0.29	0.49										
PC	0.29	0.12	0.10	0.30	0.30	0.31									
PU	0.31	0.16	0.08	0.32	0.42	0.31	0.34								
UB	0.28	0.12	0.20	0.55	0.25	0.31	0.31	0.24							
PB	0.29	0.17	0.22	0.32	0.25	0.33	0.39	0.25	0.41						
EPV	0.22	0.21	0.18	0.35	0.57	0.52	0.31	0.24	0.36	0.23					
SI	0.32	0.14	0.15	0.36	0.28	0.33	0.33	0.32	0.35	0.34	0.24				
HM	0.30	0.21	0.18	0.37	0.56	0.63	0.42	0.23	0.28	0.27	0.57	0.34			
QHD	0.18	0.02	0.06	0.19	0.08	0.12	0.33	0.16	0.30	0.25	0.20	0.23	0.19		
SV	0.39	0.24	0.15	0.36	0.53	0.51	0.27	0.26	0.37	0.33	0.57	0.25	0.61	0.25	

Source: Author.

***Note*: *EP: Patients empowerment; HJ: eHealth justice; IMI: Implementation intention; PC: Privacy Concerns; HB: Habit; UM: Utilitarian motivation; PU: Perceived usefulness; PTV: Public Trust Value; SV: Social value; HM: Hedonistic motivation; SI: Social influence; EPV: Ethical public value; QHD: Quality of eHealth delivery; PB: Perceived benefits; UB: Use behavior.**

3.10. SECOND-ORDER MEASUREMENT MODEL OF PATIENTS' VALUE MODEL (PVM)

While the discourse surrounding the concept of public value remains ongoing, Meynhardt's (2009) concept serves as a valuable starting point. His concept of public value posits that it depends on the relationship between the individual and society. This relationship is rooted in the individual and is shaped by subjective assessments of basic needs. Furthermore, it is activated by and shown in emotional and motivational states and is generated and maintained through experience-intense practices. Meynhardt's public value conceptualization paves the way for developing a scale because (1) it provides subjectively based micro-foundations of public value that are, however, (2) theoretically connected to the macro-level (i.e., the public level) and are, moreover (3) structured in four psychologically based dimensions (hedonistic, utilitarian, ethical, social).

In contrast, Meyerhardt's concept of public value ignores the crucial psychological aspect of trust as patients' public value component, which substantially impacts an individual's self-perception and conduct. Trust is commonly recognized as a crucial element of human relationships, and it holds noteworthy implications for individuals' self-perception and perception of others (Colquitt et al., 2007; Hillen et al., 2011; B. B. Nielsen, 2004). The establishment of patients' trust in physicians is a crucial factor in the provision of public value in the field of eHealth. The ability of a physician to achieve improved health outcomes or heightened patient satisfaction depends upon the establishment of trust, irrespective of their clinical competence. Patients must perceive that the appropriate course of action is being undertaken, while physicians must have faith in patients to confidently diagnose and anticipate the efficacy of treatment. Mistrust in this connection would undoubtedly reduce the public value (Bend, 2004).

Furthermore, establishing trust between patients and healthcare providers has been identified as crucial in generating real value within the healthcare experience(Osei-Frimpong et al., 2015). The current study developed a second-order reflective measurement model for

patients' public value by drawing on Meynhardt's concept of public value and the concept of trust value.

This model was formulated in accordance with Brown's (2015) guidelines. The three-step process involved in this study includes, firstly, constructing a first-order CFA solution that is both well-fitting and conceptually sound, which has been achieved in the preceding section of this chapter. Secondly, analyzing the correlations among the factors in the first-order solution, which are presented in Table 25, the results indicate that the correlation coefficients between the five components of patients' public value surpass their correlations with other constructs, with moderate to high correlations ranging from 0.421 to 0.630 (Bosco et al., 2015). Lastly, the second-order factor model is fitting with data, as evidenced by the following fit indices: $\chi 2$ (1531) = 2308.892, $\chi 2/df$ = 1.508, CFI = 0.919, SRMR =0.070, RMSEA = 0.049, and P value = 0.695; (see table 27).

This model is also presented in Figure 46. As shown in this figure, patients' public value is comprised of five first-order dimensions: public trust value, social value, hedonistic motivation, utilitarian motivation, and ethical public value. Each of these elements is examined in greater depth in Chapter 2.

Table 27. Models Fitness Indices for second-order CFA model.

Measure	Estimate	Threshold	Interpretation
x^2	2308.892	--	--
DF	1531.000	--	--
x^2/DF	1.508	Between 1 and 3	Excellent
CFI	0.919	>0.95	Acceptable
SRMR	0.070	<0.08	Excellent
RMSEA	0.049	<0.06	Excellent
P value	0.695	>0.05	Excellent

Source: Own elaboration adapted from Gaskin and Lim (2017) and Crawford and Kelder (2019).
Note: ***CFI= Comparative Fit Index; RMSEA= Root Mean Square Error of Approximation; SRMR= Standardized Root Mean Square Residual.**

Figure 46 depicted a path diagram explaining how modification indices (MIs) were validated for highly correlated indicators to second-order CFA model variables to produce a model that was more fit. Modifying the model by utilizing MIs enabled the correlation of measurement errors (Figure 46).

In addition, none of the factor loadings was lower than the predetermined minimum value of 0.50. This was especially true for the factor loadings of second-order patients' public value, which ranged from 0.70 to 0.81 in terms of their factor loading. In light of the findings, keeping all components while developing the measuring model for the patient public value scale was decided.

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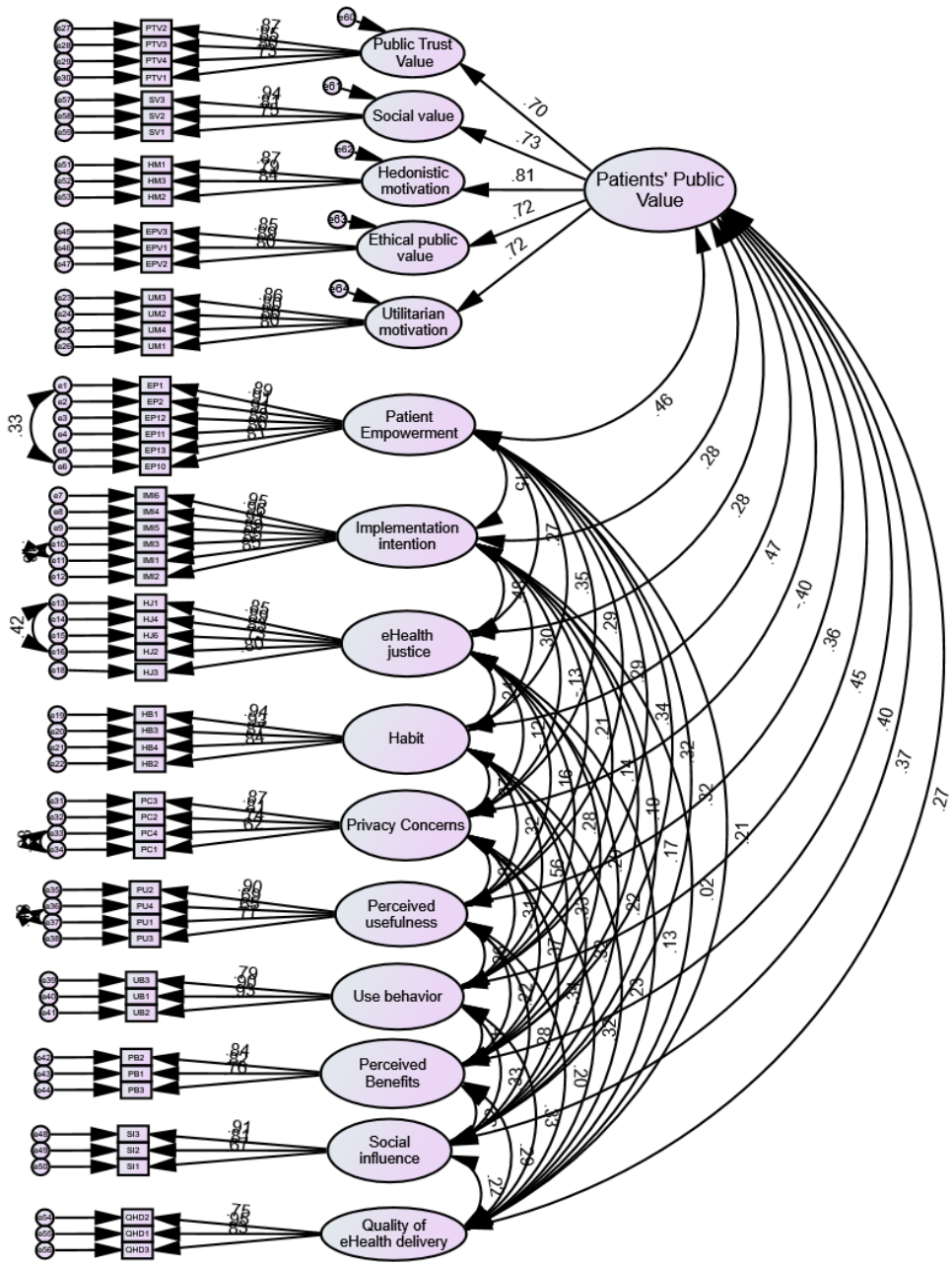

Figure 46. Second order CFA for patients' value model.
Source: Author.

As mentioned earlier, The present study utilized a total of four tests to evaluate the validity of the proposed model, namely Cronbach's Alpha, McDonald's Omega (Hair et al., 2019); composite reliability (Cheung et al., 2023; Field 2013); and Maximal Reliability (Fu et al., 2018). During the exploratory factor analysis phase, Cronbach's alpha and McDonald's omega were analyzed, and it was discovered that both were within a suitable range (for reference, see Table 14).

As seen in Table 28, the composite reliability and the maximal reliability were put to the test once more during the second-order CFA. All of these tests met the specified criteria. Regarding the evaluation of validity, the second-order confirmatory factor analysis (CFA) underwent assessment through two distinct examinations: convergence validity and discriminant validity. Furthermore, the tests mentioned above satisfied the predetermined criteria. as indicated in Tables 28 and 29

Table 28. Discriminant, Convergent validity, and Composite Reliability for second-order CFA.

Factors	CR	AVE	MSV	MaxR (H)	PE	IMI	HJ	HB	PC	PU	UB	PB	SI	QHD	Patients Public Value
PE	0.952	0.768	0.215	0.956	0.876										
IMI	0.962	0.811	0.233	0.971	0.152	0.900									
HJ	0.911	0.673	0.233	0.920	0.266	0.483	0.820								
HB	0.942	0.802	0.314	0.950	0.346	0.300	0.243	0.895							
PC	0.849	0.587	0.158	0.875	0.288	-0.130	-0.115	-0.288	0.766						
PU	0.843	0.577	0.129	0.882	0.293	0.211	0.163	0.320	-0.315	0.759					
UB	0.906	0.763	0.314	0.924	0.344	0.138	0.284	0.560	-0.306	0.263	0.874				
PB	0.849	0.653	0.189	0.854	0.322	0.189	0.291	0.334	-0.374	0.216	0.435	0.808			
SI	0.844	0.647	0.136	0.886	0.325	0.170	0.220	0.316	0.341	0.283	0.327	0.322	0.805		
QHD	0.883	0.718	0.111	0.928	0.211	0.025	0.126†	0.234	0.323	0.200	0.333	0.290	0.217	0.848	
Patients Public Value	0.856	0.544	0.217	0.860	0.464	0.282	0.284	0.465	-0.398	0.360	0.453	0.400	0.368	0.268	0.738

Source: Author.

***Note*: EP: Patients empowerment; HJ: eHealth justice; IMI: Implementation intention; PC: Privacy Concerns; HB: Habit; UM: Utilitarian motivation; PU: Perceived usefulness; PTV: Public Trust Value; SV: Social value; HM: Hedonistic motivation; SI: Social influence; EPV: Ethical public value; QHD: Quality of eHealth delivery; PB: Perceived benefits; UB: Use behavior; Diagonal values show the Square Root of the AVE.**

Table 29. Discriminant validity using the heterotrait-monotrait (HTMT) test.

Factors	PE	IMI	HJ	HB	PC	PU	UB	PB	SI	QHD	Patients Public Value
PE											
IMI	0.06										
HJ	0.03	0.47									
HB	0.30	0.29	0.19								
PC	0.29	0.12	0.10	0.30							
PU	0.31	0.16	0.08	0.32	0.34						
UB	0.28	0.12	0.20	0.55	0.31	0.24					
PB	0.29	0.17	0.22	0.32	0.39	0.25	0.41				
SI	0.32	0.14	0.15	0.36	0.33	0.32	0.35	0.34			
QHD	0.18	0.02	0.06	0.19	0.33	0.16	0.30	0.25	0.23		
Patients Public Value	0.40	0.22	0.17	0.43	0.41	0.38	0.39	0.36	0.37	0.20	

Source: Author.

***Note*: *EP: Patients empowerment; HJ: eHealth justice; IMI: Implementation intention; PC: Privacy Concerns; HB: Habit; UM: Utilitarian motivation; PU: Perceived usefulness; PTV: Public Trust Value; SV: Social value; HM: Hedonistic motivation; SI: Social influence; EPV: Ethical public value; QHD: Quality of eHealth delivery; PB: Perceived benefits; UB: Use behavior.**

3.11. ETHICAL CONSIDERATIONS

Individuals' general understanding of ethics or morals involves distinguishing right and wrong actions. These principles include the Golden Rule ("Treat others as you would like to be treated"), professional conduct codes such as the Hippocratic Oath ("First, not harm"), religious creeds like the Ten Commandments ("Do not kill"), or wise sayings like those of Confucius (David, 2015). Al-Quran 7:31 contains Allah's command, "Eat and drink, but do not waste, for Allah does not love the wasteful." Honesty, restraint, self-purity, trust, truth, chastity, modesty, and integrity are examples of individual ethics in Islam (Ebrahimi & Yusoff, 2017).

The most common approach to defining "ethics" involves setting behavioral standards that differentiate between appropriate and inappropriate actions. *Ethics* is a systematic approach, methodology, or perspective used to determine appropriate actions and assess complex issues and concerns (David, 2015). In business research, the concept of ethics pertains to a set of principles or societal standards of conduct during the research process. Applying ethical principles is vital to the organization and its members who fund the research, the researchers who conduct the study, and the participants who provide the necessary data (Sekaran & Bougie, 2016).

Therefore, ethical research requires that researchers balance knowledge-seeking with respect for the privacy and well-being of others (Neuman, 2007).

Due to the involvement of human subjects, a letter requesting research facilitation was submitted to the Scientific Research Ethics Committees at the Ministry of Health. The ethical research procedures outlined by the Ministry of Health were followed. All data collected from the survey will be kept confidential and securely stored according to established protocols. Before data collection began, the Scientific Research Ethics Committees of the Ministry of Health granted ethics approval for this study. The researcher was responsible for conducting the study ethically and reliably. As of March 23, 2023, this study has been granted ethics approval under the reference number MOH/REC/2023/100. Appendix 4 contains additional information.

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4. DATA ANALYSIS

Patients' values are essential to the successful implementation of eHealth initiatives; therefore, evaluating the adoption of eHealth technology in the Jordanian healthcare system from the perspective of patients' public values is crucial for understanding patient perspectives, addressing their concerns, and aligning digital health solutions with their preferences. By considering values such as trust, privacy, social value, hedonistic value, patient empowerment, etc., healthcare providers can optimize the adoption and impact of eHealth technology in Jordan and provide patient-centered care.

The present research endeavors to overcome the limitations identified in present adoption technology models by constructing and verifying an eHealth adoption measurement that centers on the perspectives of patients. The measurement in question has been split into three tiers according to the stimulus-organization-response (S-O-R) framework. The initial tier indicates the direct influence of stimulus factors on the primary values of patients, while the subsequent tiers relate to the direct and indirect impact of patients' values on the adoption of eHealth.

This chapter encompasses the final stages of Structural Equation Modeling (SEM) as proposed by Hair et al. (2019), which involve the specification of the structural model and the assessment of the fit indices of the structural model.

4.1. DETERMINANTS OF PATIENTS' PUBLIC VALUE (STIMULUS FACTORS)

After validating the measurement model, a structural equation analysis was employed to evaluate the influence of the stimulus factors on the sub-dimensions of patients' public value. This analysis also aimed to determine how these factors stimulate patients by affecting their values towards the adoption of the "MyHakeem app." Additionally, the relationship between stimulus variables and the public values of patients is extremely particular, leading to the categorization of this relationship into three primary models: the utilitarian motivation model, the social value model, and the ethical public value model. Path diagrams for each of these models are also depicted in Figures 47, 48, and 49.

The model fit results of each of the aforementioned models are presented in Table 30. The resulting indices indicated that the utilitarian motivation model, social value model, and ethical public value model all demonstrated an appropriate level of fit. the utilitarian motivation model ($\chi 2/df = 1.812$, CFI = 0.967, SRMR = 0.064, RMSEA = 0.062, p=0.135); the social value model ($\chi 2/df = 1.602$, CFI = 0.984, SRMR = 0.052, RMSEA = 0.053, p=0.388); and the ethical public value model ($\chi 2/df = 1.352$, CFI = 0.988, SRMR = 0.063, RMSEA = 0.041, p=0.724). These results were consistent with the established cutoff criteria in the literature (Crawford & Kelder, 2019; Gaskin & Lim, 2017).

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Table 30. Goodness-of-Fit Indices of the Structural Model (stimulus factors).

Structure model	x2	df	x2/df	CFI*	SRMR*	RMSEA*	P value
Utilitarian motivation model	121.381	67	1.812	0.967	0.064	0.062	0.135
Social value model	78.479	49	1.602	0.984	0.052	0.053	0.388
Ethical public value model	66.239	49	1.352	0.988	0.063	0.041	0.724
Threshold	--	--	Between 1 and 3	>0.90	<0.08	<0.08	>0.05

Source: Own elaboration adapted from Gaskin and Lim (2017) and Crawford and Kelder (2019).
Note: ***CFI= Comparative Fit Index; RMSEA= Root Mean Square Error of Approximation; SRMR= Standardized Root Mean Square Residual.**

Based on the information in Table 30, the models provided a reliable foundation for assessing the proposed direct relationships between the constructs, ultimately resulting in structural models. Initially, an analysis was conducted to explore the direct relationships among these constructs. Table 31 reveals that perceived usefulness has a clear positive impact on utilitarian motivation, thereby confirming H8 (β = 0.397; t = 4.523; and p <0.001). Additionally, there was a significant direct effect between positive patients' empowerment and Social value, which supports H9 (β = 0.328; t = 4.614; and p < 0.001).

Furthermore, the study found that eHealth justice (β = 0.166; t = 2.227; and p =0.026) and privacy concerns (β = -0.221; t = 2.893; and p =0.004) had a significant impact on patients' ethical values, which supports hypotheses H11 and H12. To put it simply, the ethical value of patients in adopting an eHealth app (such as MyHakeem) is affected by the eHealth justice and privacy concerns associated with these apps. However, the perceived benefits (β = 0.139; t = 1.7709; and p =0.087) and quality of eHealth delivery (β = -0.009; t = 0.118; and p =0.906) did not have a statistically significant impact on utilitarian motivation. Therefore, the hypotheses H6 and H7 were not supported. Finally, the findings indicated that the impact of social influence on social value was not statistically significant, leading to the rejection of H10 (β = 0.116; t = 1.611; and p =0.107).

Table 31. Summary of hypothesis testing results related to stimulus factors.

Hypothesis path description			SRW*	URW*	S.E.*	T value	P	Results
Perceived benefits	→	Utilitarian motivation	0.139	0.161	0.094	1.709	0.087	NS*
Quality of eHealth delivery	→	Utilitarian motivation	-0.009	-0.012	0.103	0.118	0.906	NS*
Perceived usefulness	→	Utilitarian motivation	0.397	0.464	0.103	4.523	**<.001**	Supported
Social influence	→	Social value	0.116	0.120	0.075	1.611	0.107	NS*
Patients empowerment	→	Social value	0.328	0.419	0.091	4.614	**<.001**	Supported
eHealth justice	→	Ethical public value	0.166	0.187	0.084	2.227	**0.026**	Supported
Privacy Concerns	→	Ethical public value	-0.221	-0.219	0.076	2.893	**0.004**	Supported

Source: Author.
Note**: * NS = Not significant; SRW=Standardized Regression Weights, URW= Unstandardized Regression Weights, S.E. = Standard Error.**

Figures 47, 48, and 49 illustrate that the coefficient of determination (R^2) values for utilitarian motivation, social value, and ethical public value were 20%, 14%, and 8%, respectively. The findings indicate that the utilitarian model's three independent constructs accounted for 20% of the variance in utilitarian motivation, whereas the construct factors of the social value model accounted for 14%. The ethical public value model posits that eHealth justice and privacy concerns account for 8% of the variance in ethical public value. Furthermore, the structural

models exhibited predetermined hypotheses paths and standardized regression weight coefficients.

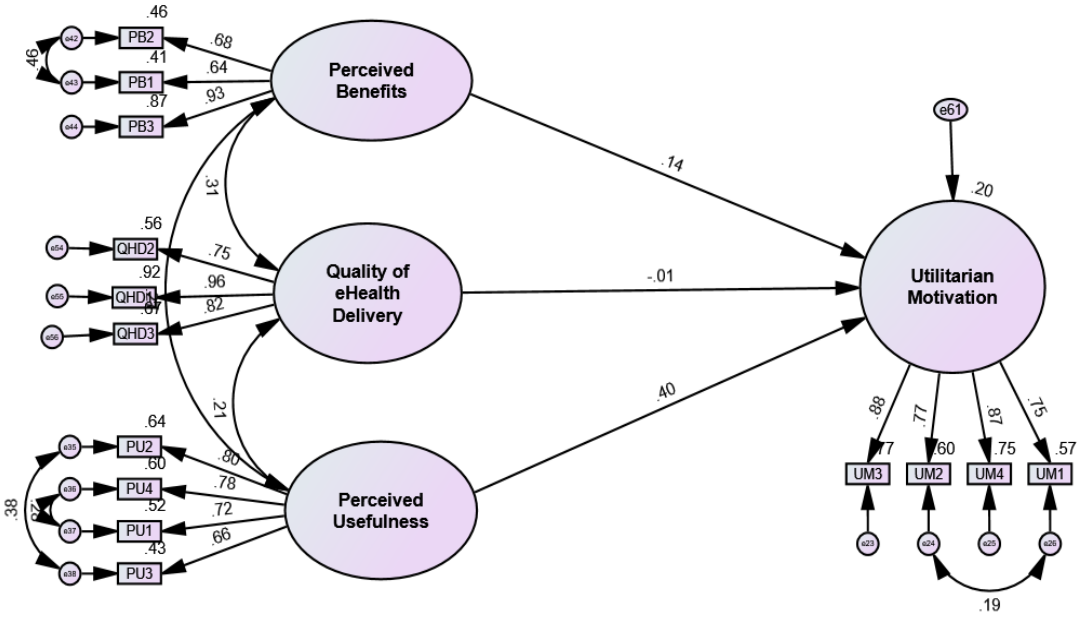

Figure 47. The utilitarian motivation model.
Source: Author.

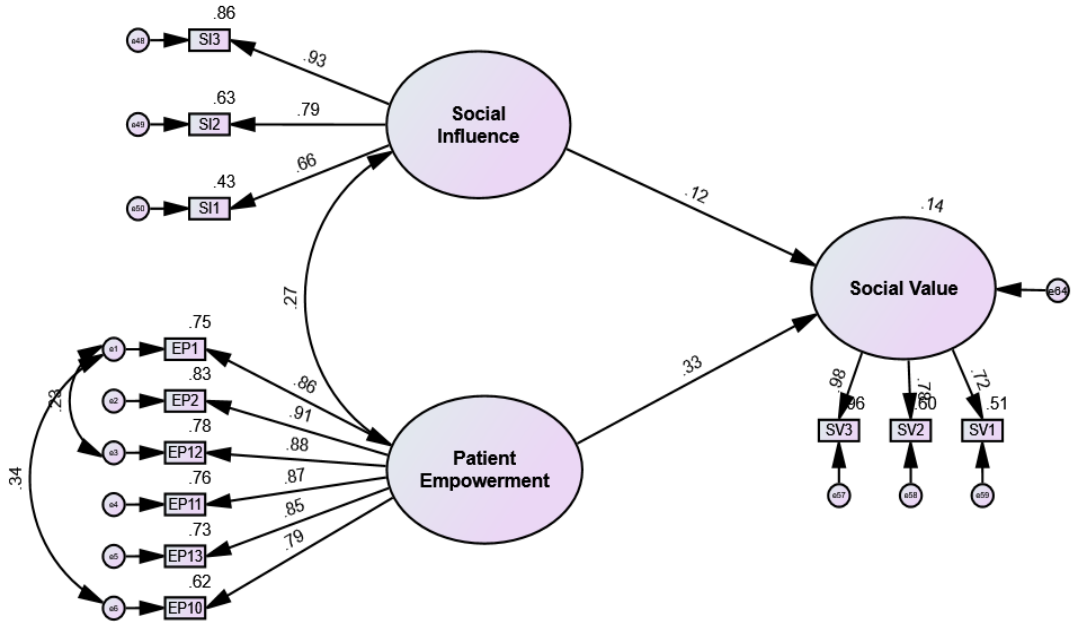

Figure 48. The social value model.
Source: Author.

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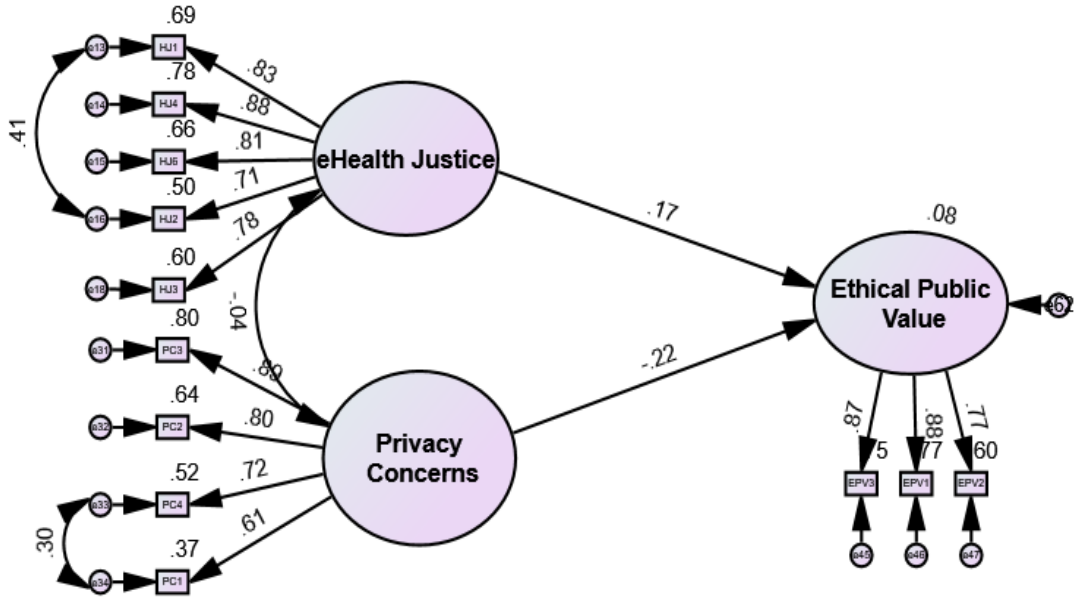

Figure 49. The ethical public value model.
Source: Author.

4.2. PATIENTS' ORGANISM AND RESPONSES RELATIONSHIP

The following levels of the research framework seek to delve deeper into the diverse factors that directly or indirectly influence the adoption of the MyHakeem platform, particularly among patients in Jordan. The aim of this part of the research is to provide an expanded understanding of the complex factors that influence the adoption of eHealth services among patients in the public sector of Jordan.

The conceptual framework draws inspiration from the work of Meynhardt and Jasinenko (2020) to conceptualize the notion of patients' public value within the context of patients' interactions with eHealth services. Patients' public value, in this context, pertains to the perceived benefits and contributions of the "MyHakeem" platform to the larger societal and healthcare landscape in Jordan. It comprises five distinct latent dimensions, each of which contributes to shaping patients' perceptions of the public value associated with the "MyHakeem" eHealth platform. These dimensions include utilitarian motivation, public trust value, social value, hedonistic motivation, and ethical public value.

On other hand, According to Byrne's (2013b) explanation, the structural model is an approach employed to identify the factors that have a direct or indirect influence on the values of other latent variables. The complexity of the model is due to its incorporation of nine latent variables and 30 observed variables, as well as the presence of distinct paths between the constructs see figure (50). The objective of the structural model utilized in this study is to assess the associations among the latent variables and verify the fundamental hypotheses of the research issues expounded in the second chapter.

In the present study, the final phase of Structural Equation Modeling (SEM), as proposed by Hair et al. (2019), involved transforming the measurement model into a structural model. The results indicated that the model fit was satisfactory, as per the criteria established by Crawford and Kelder (2019) and Gaskin and Lim (2017). Specifically, the chi-square (χ^2) value was 670.648, $\chi 2$/df was 1.487, the Comparative Fit Index (CFI) was 0.958, the Standardized Root Mean Square Residual (SRMR) was 0.059, the Root Mean Square Error of Approximation (RMSEA) was 0.048, and the P value was 0.687. No further modifications or improvements were necessary, as illustrated in Figure 50 and Table 32.

Table 32. Models Fitness Indices for 2nd level of structural model test.

Model	x^2	df	x2/df	CFI*	SRMR*	RMSEA*	P Close*
Structure model	670.648	451	1.487	0.958	0.059	0.048	0.687
Threshold	--	--	Between 1 and 3	>0.95	<0.08	<0.06	>0.05
Interpretation	--	--	Excellent	Excellent	Excellent	Excellent	Excellent

Source: Own elaboration adapted from Gaskin and Lim (2017) and Crawford and Kelder (2019).
Note: ***CFI= Comparative Fit Index; RMSEA= Root Mean Square Error of Approximation; SRMR= Standardized Root Mean Square Residual.**

As observed, all fitness indexes have achieved the required level. Thus, no item deletion or modification is required. The results showed that patients public value loads well on its five sub-constructs. The factor loadings of patients' public value on hedonistic motivation, utilitarian motivation, social value, ethical public value, and public trust value are 0.80, 0.70, 72, 73, and 0.68, respectively. Furthermore, the R^2 for all sub-constructs is high (0.64, 0.49, 0.52, 53, and 0.47), which indicates that the contribution of patients' public value to its five sub-constructs is good. In other words, the theory that patients' public value consists of five sub-constructs is well supported see below figure.

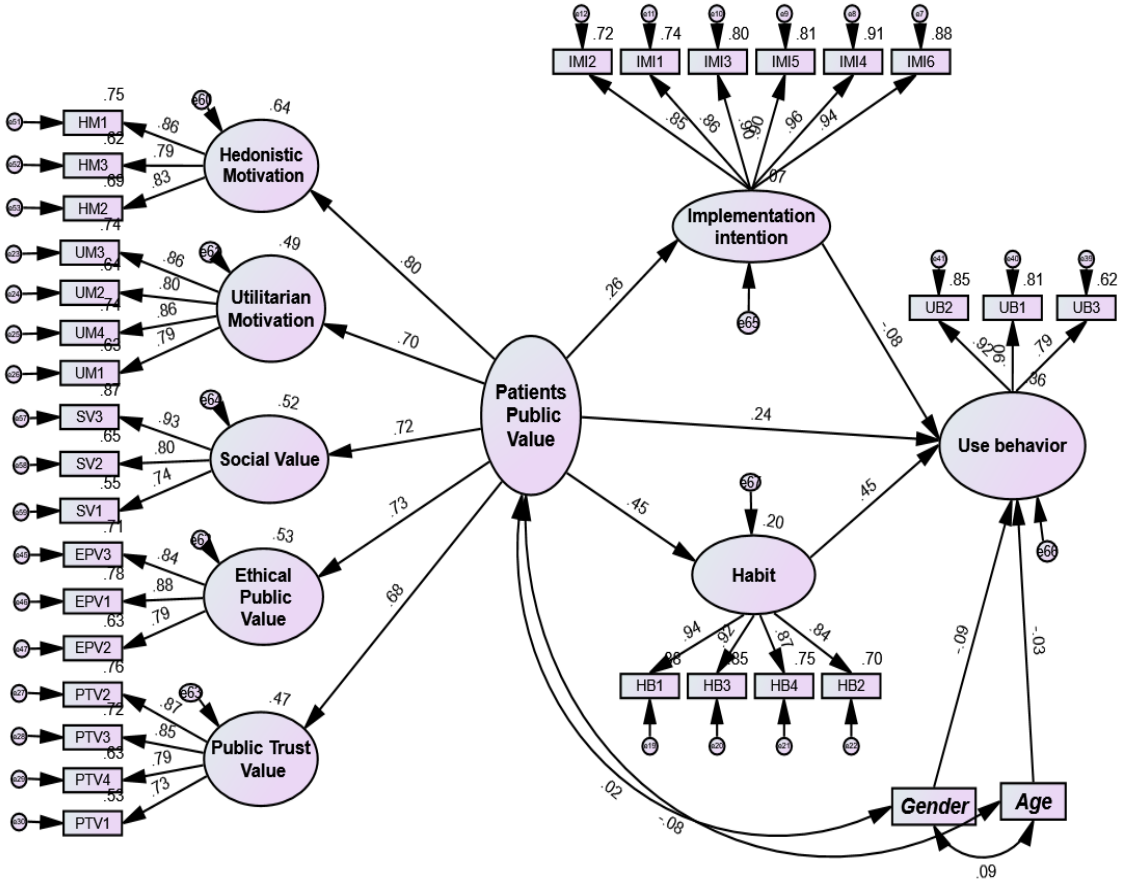

Figure 50. Second level of Structural Model Test (endogenous, mediator, and dependent factors). Source: Author.

The following table presents the estimated coefficients in standardized and unstandardized formats and the corresponding t-values and significance levels. These values provide the basis for determining whether to accept or reject the proposed hypotheses. According to Table 33, patients' public value regression coefficients positively correspond to hedonistic motivation, utilitarian motivation, social value, ethical public value, and public trust value. The standardized coefficient (beta) range is between 0.682 and 0.801, the t-value range is between 7.810 and 8.020, and all P-values are less than 0.001. These results support H1 to H5 and

ultimately contribute to the overall public value of patients. Additionally, a significant direct effect (without mediators' factors) was discovered between patients' public value and use behavior, supporting H13 ($\beta = 0.428$; $t = 5.305$; and $p<0.001$).

Table 33. Summary of hypothesis testing results.

Hypothesis path description			SRW*	URW*	S.E.*	T value	P	Results
Hedonistic Motivation	←	Patients Public value	0.801	1	.148	8.020	<.001	Supported
Utilitarian Motivation	←	Patients Public value	0.698	0.844	0.105	8.020	**<.001**	Supported
Social Value	←	Patients Public value	0.721	0.847	0.099	8.567	**<.001**	Supported
Ethical public Value	←	Patients Public value	0.731	0.906	0.108	8.380	**<.001**	Supported
Public Trust Value	←	Patients Public value	0.682	0.727	0.093	7.810	**<.001**	Supported
Patients Public value	→	Use behavior	0.428	0.426	0.080	5.305	**<.001**	Supported
Age	→	Use behavior	-0.026	-0.033	0.077	0.430	0.667	NS*
Gender	→	Use behavior	-0.09	-0.173	0.114	1.509	0.131	NS*

Source: Author.

***Note*: * NS= Not significant; SRW=Standardized Regression Weights, URW= Unstandardized Regression Weights, S.E. = Standard Error.**

Subsequent to conducting assessments on the direct path relationships within the core model, the subsequent phase consisted of examining the control impact of the two demographic factors, namely gender and age. In causal models, control variables are commonly employed to eliminate alternative explanations for results, minimize error terms, and enhance statistical power. They are constant variables that can influence or be correlated with the causal variable, the mediator, and the outcome (De Battisti & Siletti, 2019).

The most favored approach for managing control variables is to integrate them directly into the model. In academic research, it is customary to permit all control variables, whether measured or latent, show covariance as exogenous predictors within the model see Figure (50) (Mueller & Hancock, 2018). In order to assess the influence of control variables on the paths between patients' values and usage behavior, AMOS' multiple group analysis (MGA) was utilized, and control variables were explicitly incorporated into the model (see Figure 50). This approach is commonly recommended in cases where either the independent or control variables possess categorical characteristics (De Battisti & Siletti, 2019; Mueller & Hancock, 2018).

The current research adopted the approach of Hair and colleagues (2019) to examine a multi-group structural model for assessing the moderating effects of gender and age on the relationship between patients' value and use behavior. Initially, a completely unrestricted structural model was developed, followed by the estimation of a second model in which the path estimate of interest was constrained to be equivalent across the groups. The utilization of a chi-square difference test ($\Delta\chi^2$) enables the comparison of differences between models, thereby indicating whether the model fit experienced a significant increase or decrease when the estimates were subjected to equal constraints. The presence of a statistically significant difference between models suggests that there are variations in the path estimates, thereby indicating the existence of moderation. In the event that the models show no significant differences, it can be inferred that there is a lack of support for moderation. This is due to the fact that the path estimates between groups were not observed to differ (Hair et al., 2019, P.751).

As can be seen in tables 34 and 35, the p values for either gender or age factors were not significant at the level of 0.05, which indicates that there are no differences between groups within the context of the study model.

Table 34. Global test for gender as a control variable.

Overall Models (gender)	Chi-square	df	Delta (Δx2)	P value
Unconstrained	1118.020	790	x2=77.948	0.071*
Fully constrained	1195.968	851	df=61	

Source: Author.
Note: ***Not significant.**

Table 35. Global test for age as a control variable.

Overall Models (Age)	Chi-square	DF	Delta (Δx2)	P value
Unconstrained	3380.278	400	x2=181.609	0.515*
Fully constrained	3561.888	217	df= 183	

Source: Author.
Note: ***Not significant.**

4.3. IMPLEMENTATION INTENTION AND HABIT AS MEDIATORS

Within the context of mediation analysis, a mediator is an intermediate variable that serves to clarify the mechanism by which an independent variable has an effect on a given outcome (Gunzler et al., 2013). The fundamental rationale behind the widespread use of mediating variables is their role as the basis of numerous psychological theories. In the field of social psychology, for instance, it is believed that attitudes lead to intentions, which in turn lead to behavior, as proposed by the Fishbein and Ajzen theory.

On the other hand, cognitive psychology suggests that memory processes play a crucial role in how information is transmitted and ultimately leads to a response(MacKinnon et al., 2007). Within the context of technology acceptance theories, the mediator is commonly employed in models such as UTAUT and TAM, among others (Sohn & Kwon, 2020). Social psychologists have also previously argued that there are indirect pathways in the connection between values and how they are put into action. According to Rokeach, behavior that aligns with one's values is driven by the desire for consistency. Additionally, it was proposed that values may influence beliefs and personal norms, which in turn impact behavior (Ponizovskiy et al., 2019).

In line with the literature, the present study employed two mediating factors, namely implementation intention and habit. Figure 51 illustrates two models that depict the relationships between variables: the total-effect model and the mediation model. In the context of statistical analysis, the total effect refers to the impact of an independent variable on a dependent variable. Conversely, a mediator is a variable that serves to explain the effect of an independent variable on a dependent variable, as posited by Baron and Kenny, Hayes, and Preacher et al. (Burger et al., 2013). Mediation is considered to take place when the inclusion of a mediator results in a reduction of the effect of the independent variable on the dependent variable. This is indicated by a smaller regression coefficient for c’ compared to c, with c’ preferably being non-significant. Also, for mediation to happen, the indirect effect needs to be calculated. This can be done by using bootstrap methods to calculate confidence intervals for the indirect effect: The confidence interval is considered to be significant if both the lower and upper ranges are either positive or negative. This means that the confidence interval does not contain zero (ibid.). As shown in Figure (51), a mediator model decomposes the total effect, c, into the indirect effect, a*b (the product of the indirect paths a and b), and the direct effect, c' (with the mediator's effect removed). The total effect can be described as c = c' + a*b; hence, the indirect effect is ab = c—c' (Burger et al., 2013)

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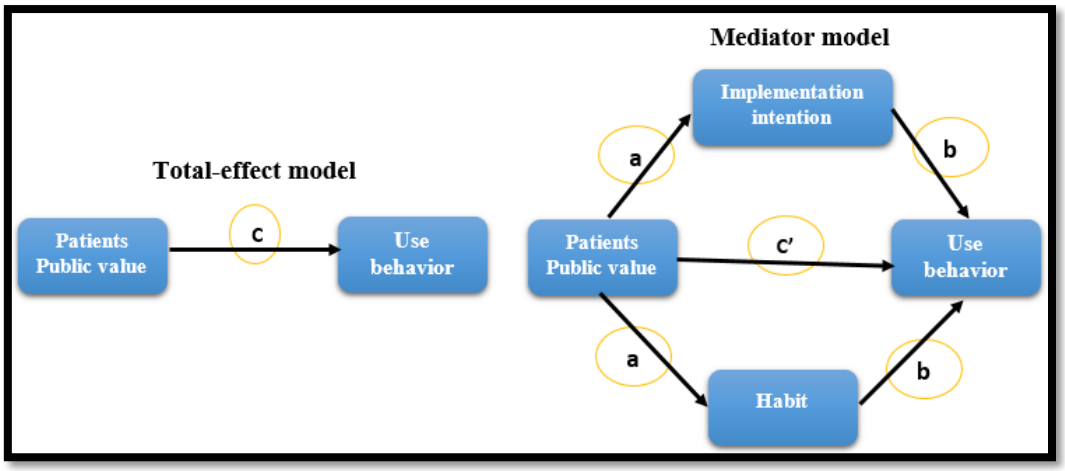

Figure 51. Total-effect model and mediation model.
Source: Own elaboration adapted from Burger et al. (2013).

It is recommended to use confidence limits based on the distribution of the product or the bootstrap, as they are crucial for understanding effects. The present study utilized computer-intensive methods, specifically resampling methods (bootstrap), to conduct mediation analysis. These methods were employed due to their availability in the AMOS program. In addition, Bootstrap was utilized for at least two reasons. These techniques offer a universal approach to testing significance and creating confidence intervals in various scenarios where analytical formulas for quantities may not exist. Furthermore, these methods have the advantage of requiring fewer assumptions compared to other tests, which increases their accuracy in comparison to traditional mediation analysis (MacKinnon et al., 2004).

Consequently, we conducted an analysis to examine the mediating effects of implementation intention and use habit on the relationship between patients' public value and use behavior. In order to produce asymmetric confidence intervals (CIs) for indirect relationships, MacKinnon et al. (2004, 2007) suggested using the bootstrap sampling method with a sample size of 5000. The mediating effects are presented in Table 36. as shown in the same table, the utilization of the eHealth application "MyHakeem" by patients on a regular basis acted (like a habit) as a mediator in the relationship between the values of patients and their usage of the MyHakeem application. This was evidenced by the fact that the confidence interval (0.131, 0.303) did not encompass zero. The regression coefficients were all found to be statistically significant at P<0.001. Therefore, it can be concluded that H15 was supported, indicating that the habit construct played a partial mediating role in the relationship between patients' values and their utilization of the MyHakeem application. In contrast, the mediating effect of patients' implementation intentions on the relationship between their values and usage of the MyHakeem app was not found, as evidenced by the inclusion of zero in the 95% confidence interval (-0.059, 0.002). As a result, the hypothesis H14 was rejected.

Table 36. Results of the bootstrapping method for mediations.

IV	M	DV	Effect IV on M (a)	Effect M on DV (b)	Direct effect (c')	Indirect effect (a*b)	Total effect (c)	95% CI	Results
PPV	IMI	UB	0.265***	-0.083	0.244	-0.022	0.222	(-0.059, 0.002)	No Mediation
PPV	HB	UB	0.455***	0.451***		0.205***	0.449***	(0.131, 0.303)	Partial mediation

Source: Author.

Note: *****P<0.001; CI: Confidence interval; IV= independent variable(s); M= mediator; DV= Dependent variable(s); PPV =Patients Public value; HB= Habit; IMI= Implementation intention; UB= Use behavior.**

4.4. SUMMARY

The current study aims to address the limitations mentioned in existing adoption technology models by developing and testing a model for eHealth adoption that focuses on patients' perspectives. The model in question has been categorized into three levels based on the stimulus-organization-response (S-O-R) framework, as depicted in Figure 52. The first tier relates to the direct effect of stimulus elements on patients' primary values. At the same time, the subsequent levels encompass both the direct and indirect effects of patients' public values on the adoption of eHealth.The present chapter contains the final phases of structural equation modeling (SEM) outlined by Hair et al. (2019). These phases pertain to the specification of the structural model and the evaluation of the fit indices associated with this model. As illustrated in Figure 52, the structure model was used to test the study's hypotheses.

Consequently, the study's findings indicate several significant discoveries. Initially, the study's findings indicate that the public value of patients consists of five primary values: hedonistic motivation, utilitarian motivation, social value, ethical public value, and public trust value. These values directly impact patients' use of the MyHakeem app, which is represented by a second-order latent variable termed "patients' public value" with a 42.8% coefficient of determination. In addition, the relationship between the public value of patients and their utilization behavior is mediated by their utilization habits, which account for 20.5% of the variance. However, the effect of implementation intentions as a mediator of the relationship above was not observed.

On the other hand, it has been observed that stimulus factors have varying effects on patients' values. The results indicate that perceived usefulness alone has a 40% impact on utilitarian motivation. In comparison, perceived benefits and quality of eHealth delivery have negligible impacts on utilitarian motivation (14% and 1%, respectively) and are not statistically significant. The study revealed that the empowerment of patients is the only factor affecting their social value, accounting for 33% of the variance. In contrast, social influence had no apparent impact on the social value of patients. In addition, the implementation of eHealth Justice has a 17% positive influence on patients' ethical values. However, using the MyHealth application generates privacy concerns, resulting in a (22%) decrease in the ethical value of patients. The results indicate no significant differences in MyHakeem application usage based on the gender or age of the participants.

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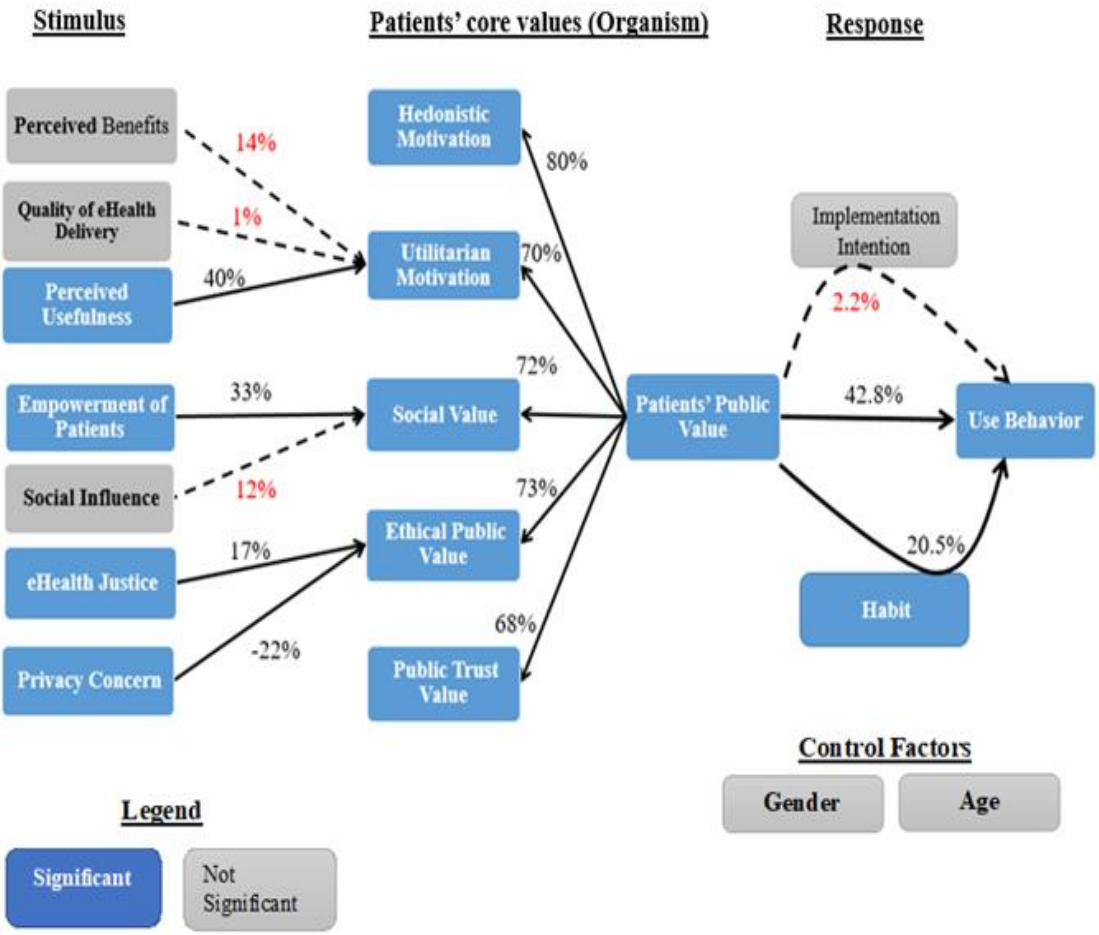

Figure 52. Final version of Patients Value model.
Source: Author.

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5. DISCUSSION

Meynhardt argues that the evaluation of value is inherent to basic needs. Needs are perceived discrepancies between an individual's actual and desirable psychological state that motivate action. Needs serve as actual or imagined evaluation reference points. Consequently, a person's evaluation of the public's value is implicitly shaped by their basic needs and the likelihood of fulfillment. Individuals will positively evaluate organizational initiatives (like eHealth) if they perceive them as contributing to satisfying their subjective needs. Without such satisfaction, individuals experience psychological discomfort, which may reduce value and result in a negative individual evaluation (Meynhardt & Jasinenko, 2021). Thus, values act as a basis for guiding our behavior.

In uncertain times, when we are unsure whether a particular thought or action is valuable or essential, we can rely on our values to make confident decisions. This ensures that our choices are morally sound, correct, and defensible (Krause & Hayward, 2014). Therefore, it is more appropriate to incorporate values into technology adoption models. However, there has been limited research on the impact of values on adoption models (Mehta et al., 2019).

In contrast, various theoretical models have been employed by scholars to explore the phenomenon of user adoption of technology. These include the innovation diffusion theory, the technology acceptance model, the theory of reasoned action, the social cognitive theory, the technology life cycle, the personal computing utilization model, and the UTAUT model, which is the most extensively utilized (D. Gu et al., 2021). Despite its popularity, UTAUT has faced criticism for its oversimplification and exclusive emphasis on individual users' attitudes, perspectives, and adoption intentions.Furthermore, it has been observed that despite the numerous studies utilizing these theories, their impact on the existing knowledge has reached a saturation point (Shachak et al., 2019).

Bagozzi (2007) critiqued technological acceptance theories, such as UTAUT, by highlighting their lack of coherence and information fragmentation, resulting in disorder. Furthermore, research on technology acceptance consistently evaluates the impact of societal factors on subjective norms, which in turn affect individuals' adoption and utilization of technology. Nevertheless, two issues arise. The adequacy of the subjective standard in addressing the multifaceted and complicated social factors that impact individuals' health-related behavioral choices may be questionable. Secondly, can the subjective norm be argued as a valid assumption? In cases where a health system or healthcare institution independently deploys an eHealth intervention, patients may not be afforded any alternatives.

Hence, precisely comprehending all the factors influencing users' acceptance of novel healthcare technology in the present circumstances is crucial for its successful adoption. Shachak and co-authors propose that forthcoming studies on the implementation and utilization of health information technology should shift from the present Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) frameworks to a comprehensive approach that accounts for the complexity of factors influencing technology implementation and utilization in the healthcare sector (Addotey-Delove et al., 2022; Shachak et al., 2019).

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In the Jordanian context, limited research has been conducted on the adoption of eHealth (MyHakeem app), as noted by Alkhwaldi (2022) and Jalghoum et al. (2021). Consequently, there remains to be a significant gap in our understanding of the potential of eHealth in Jordan.

In contrast, previous scholarly studies have predominantly focused on the benefits of eHealth for healthcare providers and the technological and infrastructure challenges they face in implementing it, as evidenced by studies conducted by Alsharo et al., 2020, 2021; Karim et al., 2021; Nassar et al., 2017; and Sulaiman & Magaireah, 2014. However, there needs to be more research on the factors that prompt patients to adopt eHealth.

This study aims to surpass prior constraints by creating and verifying a measuring instrument that concentrates on patients' views and enables quantitative survey-based research for embracing eHealth through the MyHakeem application. Additionally, this study aims to examine the correlation between patients' beliefs and the acceptance of the MyHakeem app, as well as the influence of stimulus factors embedded in an eHealth app on patients' values.

In order to accomplish these objectives, a two-step approach was utilized to employ the SEM, which involved (a) evaluating the model-data fit through a review of the measurement model(s) and (b) analyzing the structural model, as described by Vehkalahti (2011). The measurement model(s) were reviewed to determine the extent of their fit with the data, which was satisfactory. As shown in Figure 52, the structure model was utilized to test the study's hypotheses.

As a result, the study's findings point to several noteworthy discoveries. Initially, the study findings indicate that patients' public value comprises five primary values: hedonistic motivation, utilitarian motivation, social value, ethical public value, and public trust value. These values directly influence patients' use behavior of the MyHakeem app, represented by a second-order latent variable called "patients' public value," with a magnitude of 42.8%.

Moreover, it can be observed that the habits of use exhibited by patients play a mediating role in the relationship between the public value of patients and their utilization behavior, accounting for 20.5% of the variance. However, the mediating effect of implementation intentions on the relationship mentioned above was not observed.

In contrast, it has been observed that stimulus factors have varying effects on patients' values. The findings indicate that solely perceived usefulness has a 40% impact on utilitarian motivation, whereas perceived benefits and quality of eHealth delivery have negligible impacts on utilitarian motivation (14% and 1%, respectively) and are insignificant. The study revealed that patients' empowerment is the sole factor influencing their social value, accounting for 33% of the variance.

Conversely, social influence was found to have no significant impact on patients' social value. Furthermore, implementing eHealth justice has a favorable impact of 17% on patients' ethical values. However, utilizing the MyHealth application raises privacy concerns, which has an adverse effect of -22% on patients' ethical value.

Also, the findings indicate no significant difference in the utilization of the MyHakeem application based on the gender or age of the participants. This suggests that the control variables, namely gender and age, did not moderate the association between patients' values and the MyHakeem app's use. In order to obtain a comprehensive understanding of the study's findings and the methodology employed in the current study, the subsequent section will explain the methodology utilized in the study and its related model.

5.1. Study Methodology

The study presents a theoretical framework for understanding the factors influencing patients' adoption of eHealth technology. To achieve this, the researcher utilized a practical and sustainable methodology known as the "research onion," as recommended by Saunders et al. (2012, 2019). This method enabled the researcher to move beyond the initial stage of the study,

where questions and data collection procedures are established, recognizing that this stage serves as a foundation.

The "research onion" paradigm acknowledges that the abovementioned issues are just the tip of the iceberg in research methodology. The outer layers, which include the philosophical approach, research design, methods, strategy, and time horizon, are crucial in determining the credibility and conceptual framework of the research. Rather than ignoring these layers, the study recognizes their importance in establishing the groundwork and legitimacy of the research, as they provide the structure within which decisions regarding data collection and analysis are made. This ensures that the research is rigorous and meaningful.

Therefore, the present study was grounded in an epistemological assumption that employed positivism as the research philosophy and deduction as an approach for evaluating a conceptual model through empirical evidence. The study used a quantitative methodology and gathered primary data through a web-based survey. The researcher modified the measurement scales used in previous studies to create the questionnaire.

The successful completion of the study required rigorous methodological procedures for data analysis and result synthesis. In this regard, the study utilized two distinct techniques, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), on data collected from patients in Jordan.

Exploratory factor analysis (EFA) was used to explore the fundamental structure and interconnections among the variables and to identify latent components or dimensions within the dataset. Subsequently, the Confirmatory Factor Analysis (CFA) technique was employed to validate the proposed measurement model and assess its suitability with the collected data. Combining these analyses has strengthened the study's model and enhanced its validity.

Furthermore, the study proactively addressed the issue of common method bias (CMB) by incorporating the CFA marker method into the questionnaire design. The results of this study showed the absence of common method bias (CMB), indicating that the research technique used in the study effectively distinguished and assessed the various constructs without introducing any systematic bias related to a single data collection method.

To increase the study's validity, construct confirmatory factor analysis, convergent validity, construct validity, and discriminant validity were examined. This thorough procedure assures the reliability and validity of the study's findings and expands its contributions to the field of eHealth research.

5.2. PATIENTS' CORE VALUES

The study's findings indicate that a valid and reliable five-dimensional scale has been established to assess the public value of patients. The previously mentioned values, namely hedonistic motivation, utilitarian motivation, social value, ethical public value, and public trust value, are employed to encapsulate the overall public value of a patient comprehensively. Drawing on Meynhardt's concept of public value, the public value of patients can be traced back to their basic needs, which are subjectively evaluated and influenced by emotional and motivational factors and are shaped by the experiences they encounter while utilizing the eHealth application. Understanding and attending to these facets is essential in ensuring that patients receive adequate healthcare and assistance while acknowledging their significance in the broader societal context (Meynhardt, 2009, 2020).

The study's findings on patients' core values are consistent with the model proposed by Meynhardt and Jasinenko (2020). However, this study introduces a new concept of public trust value as a novel construct in their model. The study also found a significant association between the patients' public value and public trust value, as shown in Figure 52. Trust is considered a vital component in the psychological theories of interpersonal relationships (Simpson, 2007).

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Additionally, some academics view trust as a rational approach that assumes interpersonal trust is rationally motivated by interconnected interests that bind individuals (Pellegrini et al., 2021).

When it comes to patients adopting eHealth apps, they are more likely to trust and adopt these apps if they believe their interests align with those of the app developers, healthcare providers, and other relevant stakeholders. Patients may have expectations about the behavior of these parties based on the assumption that their actions will be motivated by shared interests and the common goal of improving healthcare outcomes.

Furthermore, building trust between patients and healthcare providers is crucial in delivering real value within the healthcare experience (Osei-Frimpong et al., 2015). Interestingly, the patients' public values show that hedonistic motivation was the highest value associated with the patient's values, reaching 80%. This contrasts with what Ashraf et al. (2021) found, who discovered that utilitarian values were more prevalent in developing countries than hedonistic ones. The rationale for this argument is based on the research conducted by Ashraf et al. on the values associated with electronic commerce, which differs from the electronic health context. In the latter, users prioritize avoiding pain or attaining pleasure over utilitarian value (Obie et al., 2021).

In addition, the study revealed that in the dimension of social value, there is a concurrence with the findings of Meynhardt and Jasinenko's (2020) research, which indicates that social value significantly contributes to the overall public value of patients. This points out the importance of positive relationships with others and social belonging. This dimension is rooted in the basic human need for social connection and the desire for positive relationships, social identity, and group membership.

Within eHealth, the proliferation of digital health platforms and online health communities has dramatically increased patient participation in healthcare (Rezaei Aghdam et al., 2020). Patients' participation in eHealth may occur in various ways, including healthcare providers' health technology user ratings, patient feedback and outcomes tracking, and user profiling (Barrett et al., 2016; Chamakiotis et al., 2021).

Further, Nielsen and Langstrup (2018) found that patients enact participation in different ways, such as through activism, partnership, and compliance. Patient participation through eHealth enhances social interactions, promotes transparency and accountability in healthcare, and improves patient experiences.

Additionally, Chamakiotis et al. (2021) specifically explored how online health communities generate social value by connecting individuals in post-conflict areas around a common goal of advancing healthcare. These communities serve as platforms for sharing knowledge, support, and resources, facilitating collaboration and empowerment among participants. In general, research has shed light on the ability of eHealth and virtual communities to generate societal benefits through the development of relationships, the facilitation of knowledge exchange, and the promotion of collective action in the pursuit of improved healthcare outcomes.

In contrast, the results have concluded that ethical value constitutes 73% of the overall value of patients. This finding is consistent with Meynhardt and Jasinenko's (2020) claim that this value represents the shared value attributed to personhood and the fundamental nature of humanity. This dimension is grounded in the inherent human need for self-esteem and respect, whereby the surrounding community influences and shapes personal moral and ethical values.

In the eHealth context, Boers et al. (2019) argue that eHealth affects patients' experiences, values, and norms and identifies ethical implications related to predictive and diagnostic uncertainty and the patient-eHealth-PCP (primary care professionals) relationship. This ethical dimension considers how health technologies deal with patients' data or, more specifically, whether eHealth respects and contributes to patients' self-worth and dignity. Consequently, to

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contribute to patients' public value in the ethical dimension, an eHealth system must show fair, just, ethically correct, or at least decent behavior (Jamshed et al., 2015; Jokinen et al., 2021).

5.3. PATIENTS' PUBLIC VALUE IMPACT ON USE BEHAVIOR

The present study also evaluated the explanatory power of the patients' value model; it was hypothesized that patients' public value would significantly affect their adoption and utilization of the MyHakeem app.

As anticipated, patient values had a significant impact on the adoption and utilization of eHealth applications by 42.8% of patients. Once the MyHakeem app had a high overall patient public value level (i.e., if the MyHakeem app generated patient value in all five dimensions), the association with adoption and usage was strongest. Remarkably, social value and ethical public value had the highest link with MyHakeem app use and adoption. However, most other values also strongly correlate with using and adopting the MyHakeem app. They also mostly show the highest correlation with using and adopting the MyHakeem app dimension.

The findings suggest that the concept of value impacts patient's behavior and is not a neutral factor. According to Meynhardt, the impact of value on the fulfillment of basic needs can have either a positive or negative effect on an individual's motivation and behavior. When the public value of an eHealth application is high, it is expected to meet the needs of its users effectively and lead to positive levels of adoption and usage. Conversely, in situations where the public value of an eHealth application is deemed to be low, probably, patients' basic needs will not be sufficiently met, potentially leading to negative behaviors towards the adoption and utilization of eHealth applications such as "MyHakeem" (Meynhardt & Jasinenko, 2021).

Another piece of evidence comes from neuroscientific research, which demonstrates the capacity of patients' values to impact their behavior when adopting and utilizing the MyHakeem application. Most neuroscience studies start with studying the neurochemical dopamine and the ventral tegmental area (VTA). These elements are crucial in determining how the brain processes reward-related behavior and evaluate needs, ultimately influencing its value system (Calarco & Lobo, 2021; Wager & Cox, 2009). Once the value hierarchy is established and absorbed, Fisher argues that values can influence long-term behavior choices. This can be performed by deliberately seeking out social situations consistent with one's values or by consciously engaging in behaviors consistent with the value hierarchy (Fischer, 2017). A recent review of the neuroscientific literature on value-behavior relationships summarized evidence of a more direct relationship. Brosch and Sander pointed out that an individual's value preferences may influence the perceived reward value of different behavioral options (Ponizovskiy et al., 2019).

Lastly, even though patients are more likely to adopt and utilize the MyHakeem app when their basic requirements in all five dimensions are met, the hedonistic and ethical value dimensions appear to have the most significant influence on patients' behavior. This finding suggests that patients prioritize these values when using eHealth applications. One explanation could be that the strength of value-behavior relationships depends on the significance of the value. People who attribute a high level of importance to a value will not only engage in value-expressing behaviors more frequently, but as we progress up the distribution of value importance, the relationships become more robust.

In contrast, individuals who assign low importance to a value engage in value-expressing behaviors less frequently and weaken the relationships as we move down the importance distribution (Lee et al., 2022).

5.4. HABIT OF EHEALTH APP USE AS A MEDIATOR

There are some interesting findings about the use of the MyHakeem app. The app's habitual use acts as a mediator between the patient's values and their behavior. In particular, the Habit

construct accounts for 20.5% of the correlation between values and behavior. This suggests that habits play a significant role in connecting abstract values to consistent behaviors.

Habits are behavioral patterns that are automatic and deeply ingrained, resulting from the process of repetition and reinforcement (Gardner et al., 2012). Their role involves bridging abstract values and corresponding behavioral patterns, enabling seamless translation of values into consistent behaviors (Biel et al., 2005). Verplanken and Sui (2019) added that habits can define one's identity, particularly regarding self-relevant objectives or core values. The association between habits and one's sense of identity is linked to enhanced cognitive self-integration, elevated self-esteem, and searching for an ideal self. Establishing a connection between habits and identity can maintain recently acquired behaviors, resulting in more effective changes in behavior, such as the adoption and utilization of novel eHealth applications.

Although the MyHakeem application is relatively new, having been created in 2020, patients have developed habitual patterns in their app utilization. One explanation could be that the app provides consistent and valuable features that align with the users' healthcare needs and goals. As patients repeatedly engage with the app's functionalities, such as scheduling appointments, accessing medical records, or receiving personalized health recommendations, they habitually rely on the app for their healthcare management. Additionally, the app's user-friendly interface, convenience, and positive user experiences may contribute to forming habits as patients find it easier and more efficient to use the app for their healthcare-related tasks.

Over time, these habitual patterns strengthen the value-behavior relationship as patients integrate the app into their daily routines and perceive it as a reliable and valuable tool for managing their health. Lastly, Habits have the potential to either strengthen or hinder the expression of values, depending upon their alignment or discordance with the intended conduct. By growing positive habits, individuals can create patterns and automatic behaviors aligned with their central values (Linder et al., 2022; Verplanken & Sui, 2019).

5.5. Implementation Intention as Mediator

The proposed hypothesis posits that patients' utilization of the Hakeem app is based upon the mediating role of their implementation intention, which is influenced by patients' values. Specifically, it is suggested that patients' values directly impact their intention to use the app, and this intention subsequently mediates their actual usage of the app. Nevertheless, as per the research findings, the abovementioned hypothesis was rejected. A reasonable explanation for rejecting this hypothesis is that most of the study's participants had already incorporated the MyHealth app into their daily routine, thereby causing the MyHakeem app to transition from the intention stage to habitual behavior.

Furthermore, implementation intentions have been widely employed to promote changes in health behavior. However, their application in adoption studies is infrequent (Prestwich et al., 2015). Moreover, extensive meta-analytic studies have indicated that intentions exhibit poor predictive power over behavior in real-world situations (Fischer, 2017).

Overall, the denial above is deemed appropriate based on the analysis of the gathered data, which does not establish a significant indirect impact of implementation intention in explaining the impact of patients' public value on the utilization of the application in question. This implies that additional factors beyond implementation intention may significantly influence patients' decisions to adopt the MyHakeem application.

5.6. The Influence of Stimuli on Utilitarian Motivation

The present study posits that the utilitarian value of patients can be influenced by the inherent factors of the MyHakeem application. Specifically, the perceived benefits, perceived quality, and perceived usefulness of the MyHakeem app can significantly impact the utilitarian value

of patients. The findings indicate that perceived usefulness positively correlates with patients' utilitarian motivation to engage with eHealth. Even so, the perceived benefits and perceived quality of MyHakeem did not impact the utilitarian motivation of patients to adopt eHealth. The study's findings support a singular hypothesis, specifically that eHealth's perceived usefulness positively impacts patients' utilitarian motivation to utilize eHealth. Conversely, hypotheses related to the perceived benefits and perceived quality of MyHakeem were not supported by the data.

Contrary to the study's results on perceived benefits and quality, the utilitarian perspective on consumer value perception comprises the acquisition and transaction value of goods or services (Zhu et al., 2010). Nattuvathuckal et al. (2020) also argue that utilitarian services are often evaluated based on service quality metrics. In eHealth, evaluating the value of eHealth interventions can be approached by integrating the marketing-based benefit-and-sacrifice method with the value-based healthcare framework that evaluates patient outcomes in relation to cost. This interpretation suggests that the term "benefits" may encompass financial gains or savings, which can be classified as monetary benefits, and the quality of eHealth services, which can be classified as non-monetary benefits. Monetary sacrifices refer to the expenses paid in the form of monetary outlays. In contrast, non-monetary sacrifices relate to the costs carried by patients, such as the time and energy expended in using the service (Jurkeviciute et al., 2020).

The observed difference between empirical findings and studies on the influence of perceived benefits and perceived quality on utilitarian motivation can be attributed to public health services, such as MyHakeem, being provided free of charge in Jordan. The utilization of this application does not yield any apparent monetary benefits for its users.

Additionally, it is noteworthy that MyHakeem is presently in the developmental stage and may only comprehensively cover some public health centers and hospitals in Jordan. Consequently, the application may only provide patients with some of the essential features and services they need, which may impact their assessment of the application's quality.

Nevertheless, the study's findings indicate that patients' utilitarian motivation is directly impacted by their perceived usefulness for the MyHakeem app ($\beta = 0.40$, $P < .001$). This demonstrates that increased patients' perceived usefulness leads to increased utilitarian motivation to use eHealth. The probable reason for this could be that perceived usefulness incorporates user-friendliness, Ease of Learning, usefulness for managing patients' daily health, advantages for better-managing patients' health, and overall pleasantness on the MyHealth app, and all this increases patients' utilitarian motivation toward using and adopting this app (Cho, 2016).

In contrast, eHealth technology usability concerns may originate from technical aspects, such as human-computer interaction, social ones, or users' perceptions of the technology's usefulness in attaining their operational objectives (Fanta et al., 2016).

5.7. The Influence of Stimuli on Social Value

In the patients' social value dimension, the current study examines two factors that probably impact it: social influence and patients' empowerment. In terms of social influence, the data analysis reveals that social influence does not significantly impact patients' social value towards the adoption of eHealth technologies. This finding suggests that the decisions made based on patients' social value regarding adopting eHealth apps are not strongly influenced by the opinions and behaviors of others within their social networks.

At the outset, social values are primarily the subjective emotions that individuals have about satisfying their self-esteem and improving their social identity, reflecting the significance they place on their self-image and their expectations of social identity (Wang et al., 2021). Consequently, social value depends on an individual's self-esteem and relational value, which

relate to the subjective experience of being recognized and esteemed by significant others. In contrast, social influence can be conceptualized as a dual phenomenon encompassing both a procedural aspect, which relates to the mechanisms through which one individual exerts an impact on another, and a source aspect, which pertains to the degree of influence an individual possesses (Henriques, 2011).

In instances where there is an absence of a statistically significant relationship between social influence and social value, as observed in the present study, it can be inferred that the participants of the study (i.e., patients) had already established solid opinions and social values related to the adoption of eHealth. The patients in question may have been more vulnerable to the impact of personal experiences and individual needs, as well as showing high levels of self-esteem, as opposed to being influenced by external social influences. Thus, social influence has a limited impact on this particular patient group.

In terms of patients' empowerment, the current study offers empirical support for the influence of patients' empowerment on their social value, with a magnitude of 33%. The results indicate that patient empowerment positively affects their self-esteem and social identity (their social value) during their healthcare experience. The aforementioned suggests that the empowerment of patients at the individual level, which includes personal factors such as self-esteem and self-efficacy, along with their gain of knowledge and ability to take control over their health through eHealth applications, can lead to increased satisfaction with their self-esteem and a stronger sense of their social identity. This, in turn, can result in an improvement of their self-image and expectations of social identity (Aujoulat et al., 2007; Vainauskienė & Vaitkienė, 2021; Wang et al., 2021).

5.8. The Influence of Stimuli on Ethical Public Value

The findings of the present study suggest that the MyHakeem application's inherent features influence patients' ethical values, particularly regarding privacy concerns and justice in the eHealth services provided. Initial results suggest that the MyHakeem application's privacy concerns negatively influence patients' ethical values during their interaction with eHealth. The MyHakeem application's provision of eHealth justice has been observed to positively influence patients' ethical values in their interactions with eHealth.

In digital health, ethical considerations regarding privacy are of utmost importance. Patients may have concerns about the privacy and security of their personal health information, which can raise ethical concerns about protecting their rights to confidentiality. These concerns may arise due to the fear of data breaches, unauthorized access to sensitive information, or the misuse of personal health data. As a result, patients may perceive a potential violation of their privacy rights, which could negatively impact the ethical values that patients care about when they use the MyHakeem app (Huang et al., 2022; Jokinen et al., 2021; Wadhwa & Wright, 2013).

On the other hand, eHealth justice, which refers to everyone having equal opportunity to access similar health services, has the potential to strengthen patients' ethical values while using the MyHakeem app. When patients perceive that the MyHakeem app provides fair access to healthcare services, reduces healthcare disparities, and promotes equal opportunities for all patients, it is consistent with their ethical principles of fairness, justice, and equitable healthcare delivery. This positive effect on patients' ethical values is a result of their perception that the app operates ethically and places a priority on the well-being of all patients ((Brall et al., 2019; Jokinen et al., 2021; Latulippe et al., 2020; Moghaddasi et al., 2017).

5.9. Controls Factors (Gender, and Age)

In terms of control factors, the findings indicate that gender and age do not exert a statistically significant impact on the adoption of the MyHakeem application among patients in Jordan.

This suggests that the utilization of the MyHakeem application for healthcare purposes among patients in Jordan is consistent across various patients' ages and genders.

A reasonable justification for this discovery could be attributed to the extensive prevalence of technology and the internet in Jordan, especially mobile technology. The nation has witnessed noteworthy progressions in the adoption of technology and digital infrastructure, potentially fostering an environment where gender and age differentials exert a diminished influence on the adoption of eHealth. Furthermore, the convenience and availability of portable devices and the internet, combined with the growing proficiency and ease with technology across various age demographics, may account for the absence of noteworthy inequalities.

Furthermore, education is a contributing factor in reducing the impact of gender on the adoption of health technology. According to UNESCO's findings in Jordan, the proportion of female students enrolled in natural sciences, medicine, dentistry, and pharmacy programs exceeded 60% in 2022. During the same period, the percentage of female engineering and computer science students was approximately 28% and 45%, respectively. This illustrates the extent to which education is prevalent among women in Jordan (United Nations Jordan, 2023).

Study Contributions

This study's outcomes significantly contribute to eHealth literature, information systems (IS) adoption, and public value research from both theoretical and practical standpoints. Consequently, this section has been split into two parts. The first part encompasses theoretical contributions, primarily associated with factors derived from technology adoption, public value, and eHealth literature. The subsequent section clarifies the practical implications of this study in the public health domain, particularly about the acceptance of eHealth applications by patients and the guidelines for developers of such apps.

5.10. THEORETICAL IMPLICATION

The current study provides various implications for the related academic literature. This research represents an initial endeavor to expand the scope of technology adoption theories by incorporating public value theory in eHealth adoption research. Considering the history of mainstream adoption research, there are numerous calls for the adoption field to employ an entirely novel approach. Venkatesh et al. call for an end to the replication and minor extensions of the dominant theories employed in IS research.

Additionally, scholars call for an enhancement of adoption research by providing variables that can clarify the factors contributing to the usefulness of technology for end-users. They posit that research must analyze the underlying reasons that motivate individuals to utilize technology (Hedman & Gimpel, 2010). Indeed, the assumptions of TAM and UTAUT, which are relatively simple, may need to be revised to represent the complexity of the situation in healthcare accurately. For example, acceptance factors for health care professionals and patients could vary, with patients prioritizing ease of use above health care professionals. Furthermore, the original TAM and UTAUT failed to exhibit robust predictive capabilities for technological acceptance in health care (Ammenwerth, 2019).

In order to bridge the existing research gap, the present study developed a three-layered model, drawing inspiration from the S-O-R Model. These layers encompass stimulation variables, patients' core values, and patients' responses. The researcher broadened Meynhardt and Jasinenko's public value scale by integrating patients' trust value. This enhanced scale was then employed to assess technology adoption in a novel context, specifically the adoption of eHealth by patients. The findings validate that the public value model of patients significantly influences their utilization and acceptance of eHealth apps. Consequently, it broadens understanding of public value in the context of technology adoption, especially in the healthcare domain.

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By incorporating patients' trust value into the existing dimensions of hedonistic motivation, utilitarian motivation, social value, and ethical value, this study acknowledges the importance of trust as a foundational factor influencing eHealth adoption. This theoretical development emphasizes the multidimensionality of public value and the role of trust in influencing individuals' adoption of technology. In addition, using the augmented scale to evaluate the adoption of eHealth by patients provides valuable insight into the context of healthcare technology adoption. The scale reflects a comprehensive variety of values influencing patients' decision-making by incorporating five fundamental patient values. This contributes to a more comprehensive understanding of the motivations and obstacles to eHealth adoption and provides a more precise evaluation of the value perceptions that influence patients' behaviors toward eHealth technologies.

Regarding patients' response layer, the study examined novel constructs, namely implementation intention, and habit, as potential mediators in the association between patients' public value scale and their utilization and acceptance of eHealth. The results confirm that habit is a perfect mediator in this association, whereas implementation intention does not mediate in that relationship. Despite that, the current study presents implementation intention as a potential mediator between technology adoption factors and actual use of the system instead of general intention.

Furthermore, examining the factors that generate motivation about using the MyHakeem application and their impact on patients' values in the present study carries significant theoretical implications. It sheds light on multiple aspects of eHealth adoption and patient experiences, making it a multifaceted contribution to the field. Initially, the study underscores the importance of perceived usefulness in influencing patients' utilitarian motivation. The results indicate that if patients perceive the MyHakeem application to be useful in achieving their utilitarian objectives, such as streamlined access to healthcare information or enhanced health results, it positively affects their tendency to adopt and employ the eHealth technology.

The aforementioned theoretical implication highlights the significance of developing eHealth apps that are perceived to be useful by patients and are in line with their utilitarian needs and objectives. Secondly, the study demonstrates the influence of patient empowerment on their social value. Patients who show a sense of empowerment and actively participate in the decision-making process regarding their health and managing their health are more likely to attain self-esteem. Additionally, such patients prioritize social connections, support, and collaborative relationships within the eHealth context.

Theoretical implications suggest that patients' empowerment plays a crucial role in shaping the social value of patients. This implies that enhancing patients' empowerment strategies can lead to favorable social interactions and support networks within eHealth environments. Lastly, the research identifies eHealth justice and privacy concerns as significant determinants of patients' ethical values toward eHealth. The ethical value of an app is significantly influenced by patients' perceptions of fair treatment, equitable access to eHealth services, and respect for their privacy rights. The results above emphasize the significance of promoting eHealth equity and resolving issues related to confidentiality to maintain ethical principles and develop patients' reliance and assurance in the technology.

In general, this study's theoretical implications offer perspectives on the complicated interplay among the intrinsic characteristics of eHealth applications, patients' values, and their adoption and usage of eHealth technologies. The results emphasize the significance of perceived usefulness, patient empowerment, eHealth justice, and privacy concerns in influencing the patients' public values in eHealth adoption. The implications above serve as a framework for creating patient-centric eHealth interventions and policies that prioritize the needs of patients, improve their experiences, and foster ethical and socially valuable healthcare practices.

5.11. PRACTICAL IMPLICATIONS

Similar to the theoretical contributions, the current study possesses practical implications that can aid policymakers in Jordanian public healthcare, medical practitioners, and software developers in enhancing the acceptance of the MyHakeem application among patients.

Initially, the study highlights the significance of ensuring that eHealth apps are perceived as valuable and aligned with patients' utilitarian needs. Developers and healthcare organizations must prioritize the development of eHealth apps that offer tangible advantages, such as enhanced accessibility to healthcare information and improved health outcomes. This can boost patients' motivation to adopt and employ these technologies, eventually resulting in heightened acceptance and involvement.

Moreover, acknowledging the significance of patient empowerment in shaping patients' social value highlights the need for strategies that actively involve patients in their healthcare decision-making processes. Healthcare providers should prioritize initiatives that empower patients to assume control over their health, make well-informed decisions, and actively manage their overall well-being. This can foster a sense of patients' self-esteem and encourage social connections within the eHealth context. Integrating features that promote patient engagement and collaboration can enhance the social value of eHealth technologies.

The study highlights the importance of addressing eHealth justice and privacy concerns directly, as they are crucial factors that influence patients' ethical perspectives towards eHealth technologies. Developers and policymakers must prioritize the equitable delivery of eHealth services and guarantee the protection and safeguarding of patients' privacy rights. To address patients' ethical concerns about eHealth systems, robust security measures, transparent data handling practices, and clear communication about privacy safeguards are necessary. By addressing these concerns, ethical standards are upheld, and patients' dependence and trust in eHealth technologies are fostered.

Furthermore, the study's findings about the mediating influence of habit on the relationship between patients' public value scale and their usage of eHealth applications provide significant guidance for initiatives to strengthen technology adoption. Healthcare providers can enhance the adoption of consistent and frequent eHealth utilization among patients by implementing behavioral nudges, reminders, and customized recommendations. Promoting consistent utilization can lead to enduring involvement and integrating eHealth technologies into patients' everyday practices.

In practice, the patient value model is a helpful way to assess eHealth adoption holistically. By incorporating this model into eHealth initiatives, stakeholders can gain valuable insight into patients' motivations, needs, and expectations regarding using eHealth technologies in Jordan. This knowledge can guide the design, implementation, and promotion of governmental eHealth interventions that align with patients' values, preferences, and trust, thereby increasing the likelihood of successful adoption and engagement.

Furthermore, this holistic model can help develop targeted strategies to address specific factors and improve patients' experiences, such as addressing privacy concerns, empowering Jordanian patients, promoting social support and health justice, and ensuring ethical standards are met. Ultimately, the patient value model can contribute to developing patient-centered eHealth solutions in Jordan that effectively meet patients' needs, increase their engagement, and enhance healthcare outcomes.

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6. CONCLUSION

The present chapter aims to provide a comprehensive summary of the research findings in relation to the research aims and question, as well as their value and contribution to the field of study. The study will additionally assess its limitations and suggest avenues for future research.

6.1. KEY FINDINGS OF THE STUDY

The rapid development of Industry 4.0 technologies, such as the Internet of Things (IoT), cloud computing, and big data, is leading to a significant shift in the eHealth sector (Aceto et al., 2020). These technologies have also facilitated the practice of remote patient monitoring, the provision of customized care packages, and the delivery of sophisticated care services, thereby granting benefits to healthcare practitioners and patients (Friday et al., 2022).

Although eHealth applications offer many advantages, patients are still hesitant to accept them for medical treatments, resulting in a delay in the global adoption of eHealth applications. According to Bullock and colleagues, the low adoption rate indicates that optimal strategies for effectively implementing telemedicine applications still need to be identified. Kim and colleagues support this argument and suggest that current theories such as TAM and UTAUT guiding the execution of eHealth interventions need to be revised, as they primarily focus on individual readiness to accept health technologies. The eHealth literature lacks sufficient theoretical perspectives to effectively capture the complex and interrelated relationships necessary for implementing sustainable change. Therefore, future research endeavors should focus on constructing and evaluating models that acknowledge and represent eHealth apps' multidimensional, dynamic, and interdependent nature (Heinsch et al., 2021; Rahi, 2022).

Thus, this study aimed to address the abovementioned limitations in the current body of literature by validating a model representing patients' values. The study aimed to gain insights into the central public values held by patients in Jordan about the adoption of the eHealth initiative called "MyHakeem." Additionally, the study sought to evaluate the ability of the patients' value model to predict the actual usage of eHealth technology among Jordanian patients, both with and without the presence of mediators.

Furthermore, the study sought to shed light on novel research perspectives on the influence of determinants of patients' values on their perceptions of public value when using eHealth technology. One notable advantage of the research model lies in its ability to effectively consider and account for the various factors, both multiple and multilevel, that exert influence on the process of carrying out eHealth initiatives. In contrast to prior approaches, our approach acknowledges eHealth technology's multifaceted, dynamic, and interdependent nature.

In order to answer the research questions stemming from the preceding objectives, a total of 430 questionnaires that satisfied the criteria for analysis were gathered using a random sampling technique. Meanwhile, the data analysis phase employed a two-step structural equation modeling (SEM) technique. This approach encompassed (a) assessing the adequacy of the model-data fit by examining the measurement model(s) and (b) examining the structural model. The measurement model(s) were reviewed to determine the extent of their fit with the data, which was satisfactory. At the same time, the structural model was utilized to test the study's hypotheses.

6. CONCLUSION

The structural equation modeling (SEM) analysis yielded several significant findings, namely:

1) By validating the patients' value model, this study provides a robust framework for assessing the factors influencing patients' values and preferences related to eHealth adoption in Jordanian healthcare. The findings shed light on the multidimensional public values held by patients. The results of this study provide insight into the diverse public values that patients hold, which can be categorized into five distinct values. Among these values, hedonistic and ethical values are the most prominent, followed by social and utilitarian motivations. The trust value is identified as the least prominent among the five values.

2) The study results indicate that the factors of the patients' value model have a strong predictive power about the actual usage of eHealth. This predictive ability is particularly significant when considering the patients' public values and habitual behaviors. Nevertheless, the impact of patients' implementation intentions on the utilization of eHealth was limited.

3) The study delved into understanding the influence of various stimuli factors, including patients' empowerment, social influence, perceived usefulness, perceived benefits, quality of eHealth services, privacy concerns, and eHealth justice, on patients' public value perceptions when utilizing eHealth technology. The findings revealed that some determinants of patients' values significantly impacted patients' public value, whereas other factors did not exhibit a significant effect. Specifically, patients' empowerment, perceived usefulness, privacy concerns, and eHealth justice emerged as influential factors in shaping patients' public value perceptions. These findings suggest that patients who experience a sense of empowerment and perceive eHealth technology as valuable and fair are more likely to enhance their values toward eHealth apps.

Furthermore, privacy concerns also negatively impact the formation of patients' ethical values toward eHealth technology. Conversely, the research revealed that social influence, perceived benefits, and the quality of eHealth services did not significantly influence patients' public value.

In this vein, these findings hold significant implications for the design and execution of eHealth initiatives. Healthcare providers and policymakers should prioritize strategies that promote patient empowerment, highlight the utility of eHealth technology, tackle privacy concerns, and guarantee the presence of eHealth justice to foster positive public value for patients. Furthermore, it is imperative to explore strategies to enhance social influence, emphasize the benefits of eHealth services, and improve service quality to augment patients' public value further.

In conclusion, this research has yielded valuable findings regarding the factors influencing patients' values and their adoption of eHealth technology in Jordan. Utilizing the validated patients' value model and an understanding of patients' core public values, along with public value determinants, provide significant guidance for healthcare professionals, researchers, and policymakers in developing patient-centered eHealth initiatives. This, in turn, aims to improve healthcare outcomes and address the changing demands of patients within Jordan's healthcare system.

6.2. LIMITATION

The current study contributes to the existing academic literature and its practical applications. Nevertheless, similar to other empirical studies, this research also has certain limitations that readers should consider when interpreting the results.

First, in multiple-group analysis, the sample size within the age group of patients was minimal. Therefore, caution must be taken when generalizing these findings to the entire population. A tiny sample size cannot guarantee a stable maximum likelihood estimation (MLE) solution, according to Hair et al. (2019).

Second, the current study examined an eHealth app (MyHakeem), which is still in the process of development, and found that the application did not contain all the services and features that patients needed. This resulted in the absence of an identification of the actual influence of certain variables on patient values.

Third, this research is situated within the framework of Jordan's emerging economy, characterized by distinct health and digital infrastructure compared to more developed countries. Hence, it is not possible to apply the results to developed economies.

Fourth, the study model did not incorporate the factors associated with eHealth technology infrastructure.

6.3. FUTURE RESEARCH

This study presents potential avenues for future research to investigate further the complex nature of patients' values and their adoption of eHealth technology. Further investigation is warranted to examine additional variables' potential mediating and moderating influences on the association between patients' values and the adoption of eHealth technologies. Longitudinal studies possess the potential to offer significant insights into the long-term sustainability and efficacy of eHealth initiatives.

Moreover, applying the study's model within the healthcare provider setting and investigating the effects of eHealth adoption on health outcomes and the efficiency of the healthcare system would enhance the overall advancement and effectiveness of patient-centered eHealth initiatives. Incorporating additional public value determinants into the study's model will yield a deeper understanding of public value perceptions and adoption behavior within diverse healthcare systems and cultural contexts. Further, by incorporating public value theory into technology adoption models, particularly within eHealth and Healthcare 4.0, these models can be consistent with recent technological developments.

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APPENDICES

Appendix 1. Multicollinearity of study's factors.

Variables	Collinearity Statistics	
	Tolerance	VIF
HM	.762	1.313
UM	.616	1.623
SV	.792	1.263
EPV	.735	1.360
PTV	.760	1.316
EP	.924	1.082
SI	.920	1.087
PB	.915	1.093
PU	.927	1.079
QHD	.917	1.091
HJ	.841	1.189
PC	.848	1.179
IMI	.897	1.115
HB	.896	1.116

Source: Auther.

Appendix 2. Parallel analysis.

Real Data Eigenvalues		PA (Random Data Eigenvalues)		
Factor	Eigenvalues	Factor	Mean Eigenvalue	Percentile Eigenvalue
1	11.850	1	2.192227	2.311143
2	5.099	2	2.078160	2.163033
3	4.104	3	1.989925	2.067710
4	3.447	4	1.913445	1.985932
5	3.103	5	1.848361	1.927795
6	2.680	6	1.788794	1.837295
7	2.608	7	1.730476	1.780782
8	2.227	8	1.678896	1.724397
9	2.158	9	1.629981	1.673060
10	2.046	10	1.585463	1.622776
11	1.993	11	1.540202	1.582038
12	1.814	12	1.495784	1.531813
13	1.484	13	1.457167	1.491327
14	1.477	14	1.418153	1.460734
*15**	*1.419*	*15*	*1.378724*	*1.413090*
16	.860	16	1.341426	1.382753
17	.697	17	1.304637	1.344911

Source: Own elaboration adapted from Patil et al. (2017).

***Note*: *In parallel analysis the number of var. is 58 and sample size was 215; The number of factors to retain will be the number of eigenvalues (generated from the researcher's dataset) that are larger than the corresponding random eigenvalues. Perform parallel analysis throughout SPSS syntax and this website https://analytics.gonzaga.edu/parallelengine/**

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Appendix 3. Parameter estimates and regression weights for overall study model.

Items		Factors	SRW	URW	S.E.	C.R.	P
SV	<---	Patients Public Value	*0.730*	*0.85*	*0.095*	*8.949*	***
HM	<---	Patients Public Value	*0.808*	*1*			
EPV	<---	Patients Public Value	*0.724*	*0.885*	*0.103*	*8.563*	***
UM	<---	Patients Public Value	*0.722*	*0.861*	*0.102*	*8.478*	***
PTV	<---	Patients Public Value	*0.700*	*0.736*	*0.09*	*8.193*	***
EP1	<---	PE	0.889	0.971	0.048	20.414	***
EP2	<---	PE	0.911	0.946	0.043	21.764	***
EP12	<---	PE	0.909	1			
EP11	<---	PE	0.877	0.954	0.048	19.773	***
EP13	<---	PE	0.863	0.934	0.049	18.987	***
EP10	<---	PE	0.806	0.789	0.048	16.318	***
IMI6	<---	IMI	0.947	0.955	0.031	30.881	***
IMI4	<---	IMI	0.957	1			
IMI5	<---	IMI	0.906	0.844	0.033	25.539	***
IMI3	<---	IMI	0.886	0.919	0.039	23.588	***
IMI1	<---	IMI	0.850	0.852	0.041	20.674	***
IMI2	<---	IMI	0.851	0.852	0.041	20.778	***
HJ1	<---	HJ	0.846	1			
HJ4	<---	HJ	0.891	0.991	0.06	16.474	***
HJ6	<---	HJ	0.831	0.926	0.062	14.834	***
HJ2	<---	HJ	0.730	0.835	0.053	15.616	***
HJ3	<---	HJ	0.796	0.943	0.068	13.881	***
HB1	<---	HB	0.939	0.998	0.04	24.812	***
HB3	<---	HB	0.926	1			
HB4	<---	HB	0.870	0.943	0.047	20.097	***
HB2	<---	HB	0.842	0.85	0.046	18.525	***
UM3	<---	UM	0.861	1			
UM2	<---	UM	0.802	0.829	0.059	14.15	***
UM4	<---	UM	0.863	0.862	0.054	15.834	***
UM1	<---	UM	0.796	0.754	0.054	13.992	***
PTV2	<---	PTV	0.874	0.958	0.062	15.549	***
PTV3	<---	PTV	0.851	1			
PTV4	<---	PTV	0.796	0.861	0.063	13.651	***
PTV1	<---	PTV	0.731	0.782	0.065	12.096	***
PC3	<---	PC	0.874	1			
PC2	<---	PC	0.811	0.805	0.062	12.939	***
PC4	<---	PC	0.739	0.692	0.06	11.601	***
PC1	<---	PC	0.619	0.589	0.064	9.233	***
PU2	<---	PU	0.902	1			
PU4	<---	PU	0.694	0.818	0.078	10.493	***
PU1	<---	PU	0.647	0.731	0.076	9.636	***
PU3	<---	PU	0.770	0.861	0.073	11.794	***
UB3	<---	UB	0.788	0.974	0.064	15.323	***

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UB1	<---	UB	0.897	0.932	0.048	19.421	***
UB2	<---	UB	0.930	1			
PB2	<---	PB	0.843	1			
PB1	<---	PB	0.817	0.848	0.069	12.357	***
PB3	<---	PB	0.762	0.832	0.072	11.618	***
EPV3	<---	EPV	0.846	0.816	0.054	15.144	***
EPV1	<---	EPV	0.886	1			
EPV2	<---	EPV	0.800	0.807	0.057	14.048	***
SI3	<---	SI	0.914	1			
SI2	<---	SI	0.808	0.83	0.066	12.574	***
SI1	<---	SI	0.674	0.644	0.062	10.425	***
HM1	<---	HM	0.868	1			
HM3	<---	HM	0.789	0.749	0.056	13.369	***
HM2	<---	HM	0.836	0.91	0.063	14.412	***
QHD2	<---	QHD	0.751	0.865	0.065	13.251	***
QHD1	<---	QHD	0.951	1			
QHD3	<---	QHD	0.829	0.812	0.053	15.235	***
SV3	<---	SV	0.938	1			
SV2	<---	SV	0.807	0.808	0.055	14.82	***
SV1	<---	SV	0.747	0.723	0.055	13.205	***

Source: Author.

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Appendix 4 Ethical approval.

Reino Hachemita de Jordania
Ministerio de Salud

Número: Enseñanza/Información/ 3740
Fecha: 29/03/2023

Gerente de Administración del hospital Al Bashir
Gerente de Dirección de Salud de provincia.....
Director del hospital.....

Saludos,

Adjunto una fotocopia de la carta del Gerente de Administración del hospital Al Bashir/ Presidente del Comité de Ética en Investigación Científica Número MBA/Comité de Ética/4779 de fecha 23/03/2023 respecto a la aprobación del estudiante de doctorado **MOHAMMAD SALEM AHMED ALHUR** de la Universidad de la Universidad de Santiago de Compostela (España) para realizar una investigación titulada:

(Evaluación de la adopción de la salud electrónica en el sistema de atención sanitaria jordano: una extensión modelo UTAUT)

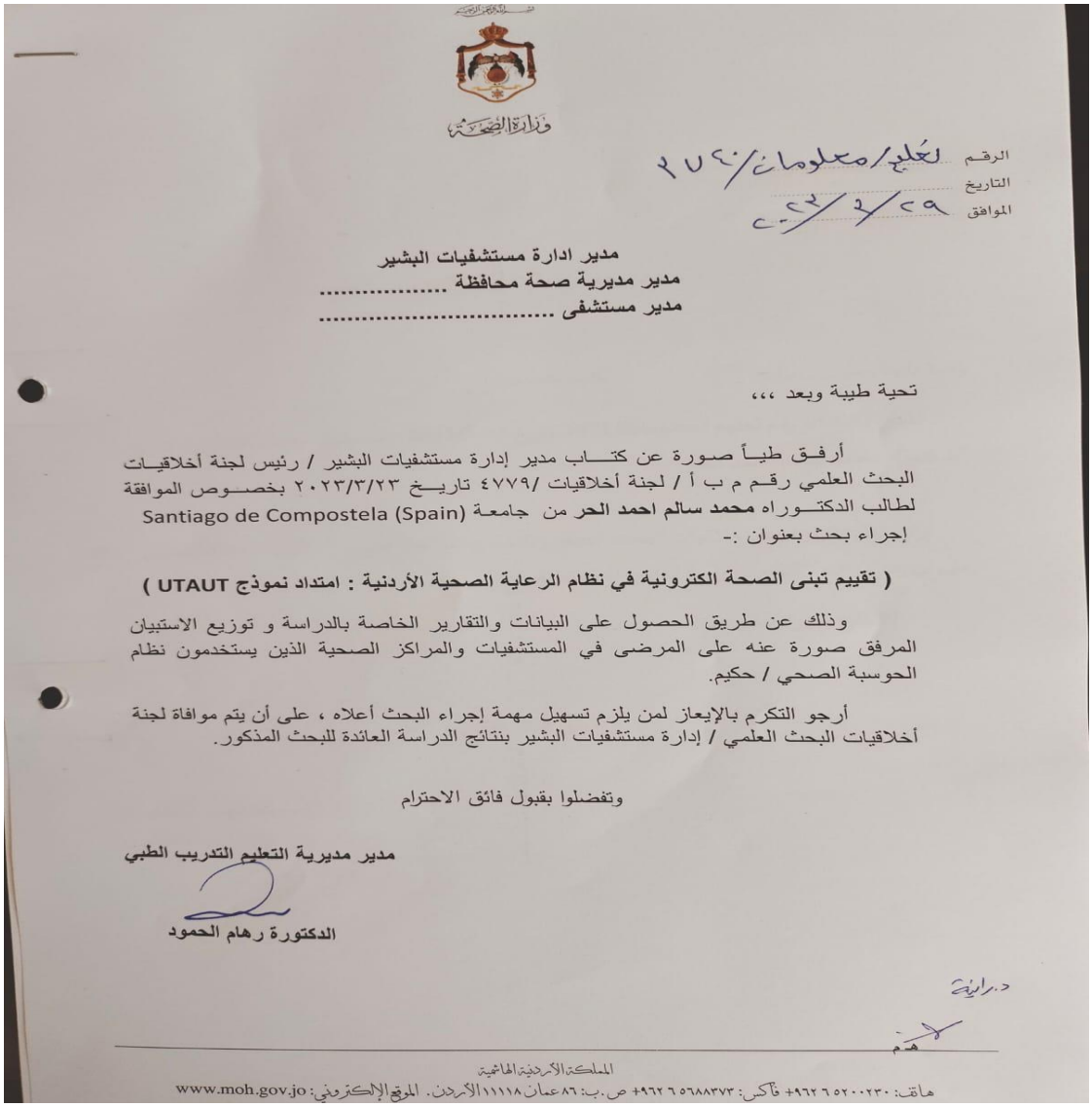
Esto se hace obteniendo datos e informes relacionados con el estudio y distribuyendo el cuestionario adjunto a los pacientes de hospitales y centros médicos que utilizan el sistema informático de salud/ Hakeem.

Les pido amablemente que informen a quienes necesiten facilitar la tarea de realizar la investigación antes mencionada, siempre que el Comité de Ética de la Investigación Científica/Administración del Hospital Al-Bashir reciba los resultados del estudio relacionado con la investigación antes mencionada.

Atentamente,

Director de Enseñanza y Entrenamiento Medico
Dr. Reham Al Hmoud
Firmado

AGATO Certified True Translation
Abu Ghazaleh
21 OCT 2023
Signature.....



وزارة الصحة

الرقم تعليم/معلومات/٢٠٤٠
التاريخ
الموافق ٢٠٢٣/٣/٢٩

مدير ادارة مستشفيات البشير
مدير مديرية صحة محافظة .....
مدير مستشفى .....

تحية طيبة وبعد ،،،

أرفق طياً صورة عن كتاب مدير إدارة مستشفيات البشير / رئيس لجنة أخلاقيات البحث العلمي رقم م ب أ / لجنة أخلاقيات /٤٧٧٩ تاريخ ٢٠٢٣/٣/٢٣ بخصوص الموافقة لطالب الدكتوراه **محمد سالم احمد الحر** من جامعة Santiago de Compostela (Spain) إجراء بحث بعنوان :-

(تقييم تبنى الصحة الكترونية في نظام الرعاية الصحية الأردنية : امتداد نموذج UTAUT)

وذلك عن طريق الحصول على البيانات والتقارير الخاصة بالدراسة و توزيع الاستبيان المرفق صورة عنه على المرضى في المستشفيات والمراكز الصحية الذين يستخدمون نظام الحوسبة الصحي / حكيم.

أرجو التكرم بالإيعاز لمن يلزم تسهيل مهمة إجراء البحث أعلاه ، على أن يتم موافاة لجنة أخلاقيات البحث العلمي / إدارة مستشفيات البشير بنتائج الدراسة العائدة للبحث المذكور.

وتفضلوا بقبول فائق الاحترام

مدير مديرية التعليم التدريب الطبي

الدكتورة رهام الحمود

المملكة الأردنية الهاشمية
هاتف: ٠٦٥٢٠٠٢٣٠ +٩٦٢ فاكس: ٠٦٥٦٨٨٣٧٣ +٩٦٢ ص.ب: ٨٦ عمان ١١١١٨ الأردن. الموقع الإلكتروني: www.moh.gov.jo

Source: Ministry of Health.

Appendix 5. EFA output.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.763
Bartlett's Test of Sphericity	Approx. Chi-Square	11764.647
	df	1653
	Sig.	.000

Source: Author.

Communalities		
	Initial	Extraction
HM1	.803	.806
HM2	.816	.885
HM3	.786	.762
UM1	.727	.700
UM2	.812	.876
UM3	.762	.783
UM4	.700	.623
SV1	.852	.847
SV2	.823	.818
SV3	.875	.933
EPV1	.724	.705

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EPV2	.802	.835
EPV3	.788	.848
PTV1	.727	.695
PTV2	.752	.736
PTV3	.720	.693
PTV4	.809	.776
EP1	.865	.835
EP10	.738	.678
EP11	.848	.763
EP12	.821	.802
EP13	.777	.734
EP2	.808	.789
SI1	.830	.841
SI2	.873	.842
SI3	.807	.795
PB1	.752	.540
PB2	.779	.715
PB3	.752	.802
PU1	.817	.661
PU2	.888	.801
PU3	.815	.783
PU4	.840	.793
QHD1	.825	.834
QHD2	.861	.696
QHD3	.774	.697
HJ1	.895	.850
HJ2	.896	.806
HJ3	.775	.535
HJ4	.891	.834
HJ6	.763	.567
PC1	.869	.805
PC2	.920	.852
PC3	.918	.827
PC4	.853	.712
IMI1	.887	.643
IMI2	.874	.748
IMI3	.796	.643
IMI4	.852	.752
IMI5	.847	.758
IMI6	.874	.708
HB1	.906	.861
HB2	.853	.682
HB3	.887	.840
HB4	.863	.692
UB1	.857	.758
UB2	.836	.850
UB3	.812	.624
Extraction Method: Maximum Likelihood.		

Source: Author.

Total Variance Explained							
Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings'
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	11.850	20.432	20.432	11.519	19.861	19.861	6.233
2	5.099	8.792	29.224	4.231	7.295	27.156	6.463
3	4.104	7.076	36.300	3.225	5.561	32.716	5.895
4	3.447	5.943	42.243	3.675	6.336	39.052	6.327
5	3.103	5.350	47.594	3.179	5.482	44.534	5.345
6	2.680	4.620	52.214	2.697	4.650	49.184	4.858
7	2.608	4.496	56.710	2.102	3.624	52.808	4.279

8	2.227	3.839	60.549	2.226	3.839	56.647	4.438
9	2.158	3.720	64.269	1.856	3.199	59.846	3.535
10	2.046	3.527	67.797	1.812	3.125	62.971	4.739
11	1.993	3.436	71.233	2.058	3.548	66.519	4.113
12	1.814	3.128	74.361	1.705	2.940	69.459	4.075
13	1.484	2.558	76.919	1.268	2.187	71.645	3.733
14	1.477	2.547	79.466	1.272	2.192	73.838	5.451
15	1.419	2.446	81.912	1.247	2.149	75.987	3.777
16	.860	1.483	83.395				
17	.697	1.201	84.596				
18	.655	1.129	85.725				
19	.583	1.005	86.731				
20	.510	.879	87.610				
21	.488	.842	88.451				
22	.473	.815	89.266				
23	.427	.737	90.003				
24	.401	.691	90.694				
25	.365	.629	91.324				
26	.358	.616	91.940				
27	.313	.540	92.480				
28	.310	.535	93.015				
29	.287	.496	93.510				
30	.276	.476	93.987				
31	.262	.451	94.438				
32	.250	.432	94.870				
33	.231	.398	95.267				
34	.220	.380	95.647				
35	.206	.355	96.003				
36	.192	.330	96.333				
37	.184	.318	96.651				
38	.178	.308	96.958				
39	.151	.261	97.219				
40	.147	.253	97.473				
41	.135	.232	97.705				
42	.130	.224	97.929				
43	.125	.215	98.145				
44	.121	.209	98.354				
45	.112	.194	98.547				
46	.102	.176	98.723				
47	.100	.173	98.896				
48	.086	.149	99.045				
49	.083	.143	99.188				
50	.079	.136	99.324				
51	.065	.112	99.437				
52	.057	.098	99.535				
53	.056	.097	99.631				
54	.053	.091	99.722				
55	.046	.079	99.802				
56	.045	.077	99.879				
57	.039	.066	99.945				
58	.032	.055	100.000				
Extraction Method: Maximum Likelihood.							
a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.							

Source: Author.

Appendix 6. Parallel analysis program.

```
set mxloops=9000 printback=off width=80  seed = 1953125.
matrix.
```

```
* enter your specifications here.
compute ncases    = 215.
compute nvars     = 58.
compute ndatsets = 100.
compute percent  = 95.
* Specify the desired kind of parallel analysis, where:
  1 = principal components analysis
  2 = principal axis/common factor analysis.
compute kind = 1.

****************** End of user specifications. ******************

* principal components analysis.
do if (kind = 1).
compute evals = make(nvars,ndatsets,-9999).
compute nm1 = 1 / (ncases-1).
loop #nds = 1 to ndatsets.
compute x = sqrt(2 * (ln(uniform(ncases,nvars)) * -1) ) &*
          cos(6.283185 * uniform(ncases,nvars) ).
compute vcv = nm1 * (sscp(x) - ((t(csum(x))*csum(x))/ncases)).
compute d = inv(mdiag(sqrt(diag(vcv)))).
compute evals(:,#nds) = eval(d * vcv * d).
end loop.
end if.

* principal axis / common factor analysis with SMCs on the diagonal.
do if (kind = 2).
compute evals = make(nvars,ndatsets,-9999).
compute nm1 = 1 / (ncases-1).
loop #nds = 1 to ndatsets.
compute x = sqrt(2 * (ln(uniform(ncases,nvars)) * -1) ) &*
          cos(6.283185 * uniform(ncases,nvars) ).
compute vcv = nm1 * (sscp(x) - ((t(csum(x))*csum(x))/ncases)).
compute d = inv(mdiag(sqrt(diag(vcv)))).
compute r = d * vcv * d.
compute smc = 1 - (1 &/ diag(inv(r)) ).
call setdiag(r,smc).
compute evals(:,#nds) = eval(r).
end loop.
end if.

* identifying the eigenvalues corresponding to the desired percentile.
compute num = rnd((percent*ndatsets)/100).
compute results = { t(1:nvars), t(1:nvars), t(1:nvars) }.
loop #root = 1 to nvars.
compute ranks = rnkorder(evals(#root,:)).
loop #col = 1 to ndatsets.
do if (ranks(1,#col) = num).
compute results(#root,3) = evals(#root,#col).
break.
```

```
end if.
end loop.
end loop.
compute results(:,2) = rsum(evals) / ndatsets.

print /title="PARALLEL ANALYSIS:".
do if   (kind = 1).
print /title="Principal Components".
else if (kind = 2).
print /title="Principal Axis / Common Factor Analysis".
end if.
compute specifs = {ncases; nvars; ndatsets; percent}.
print specifs /title="Specifications for this Run:"
 /rlabels="Ncases" "Nvars" "Ndatsets" "Percent".
print results /title="Random Data Eigenvalues"
 /clabels="Root" "Means" "Prcntyle"  /format "f12.6".

do if   (kind = 2).
print / space = 1.
print /title="Compare the random data eigenvalues to the".
print /title="real-data eigenvalues that are obtained from a".
print /title="Common Factor Analysis in which the # of factors".
print /title="extracted equals the # of variables/items, and the".
print /title="number of iterations is fixed at zero;".
print /title="To obtain these real-data values using SPSS, see the".
print /title="sample commands at the end of the parallel.sps program,".
print /title="or use the rawpar.sps program.".
print / space = 1.
print /title="Warning: Parallel analyses of adjusted correlation matrices".
print /title="eg, with SMCs on the diagonal, tend to indicate more factors".
print /title="than warranted (Buja, A., & Eyuboglu, N., 1992, Remarks on parallel".
print /title="analysis. Multivariate Behavioral Research, 27, 509-540.).".
print /title="The eigenvalues for trivial, negligible factors in the real".
print /title="data commonly surpass corresponding random data eigenvalues".
print /title="for the same roots. The eigenvalues from parallel analyses".
print /title="can be used to determine the real data eigenvalues that are".
print /title="beyond chance, but additional procedures should then be used".
print /title="to trim trivial factors.".
print / space = 1.
print /title="Principal components eigenvalues are often used to determine".
print /title="the number of common factors. This is the default in most".
print /title="statistical software packages, and it is the primary practice".
print /title="in the literature. It is also the method used by many factor".
print /title="analysis experts, including Cattell, who often examined".
print /title="principal components eigenvalues in his scree plots to determine".
print /title="the number of common factors. But others believe this common".
print /title="practice is wrong. Principal components eigenvalues are based".
print /title="on all of the variance in correlation matrices, including both".
print /title="the variance that is shared among variables and the variances".
print /title="that are unique to the variables. In contrast, principal".
```

```
print /title="axis eigenvalues are based solely on the shared variance".
print /title="among the variables. The two procedures are qualitatively".
print /title="different. Some therefore claim that the eigenvalues from one".
print /title="extraction method should not be used to determine".
print /title="the number of factors for the other extraction method.".
print /title="The issue remains neglected and unsettled.".
end if.
end matrix.
```

Source: Own elaboration adapted from O'connor (2000).

Appendix 7. Test for mvn using henze-zirkler's test and mardia's test

Henze-Zirkler's test

```
> library(MVN)
data_file <- "C:/Users/user/Desktop/proposal2/EFA CFA models/EFA pilot study/outliers/data fit/data43.dat"
> result = mvn(data = data[,1:15], mvnTest = "hz")
> #### Multivariate Normality Result
> result$multivariateNormality
         Test       HZ    p value MVN
1 Henze-Zirkler 0.9998314 0.07457926 YES
```

Mardia's test

```
> # Load the MVN package
> library(MVN)
> data_file <- "C:/Users/user/Desktop/proposal2/EFA CFA models/EFA pilot study/outliers/data fit/data43.dat
"
>
> # Load the data
> data <- read.table(data_file, header = TRUE)
>
> # Perform Mardia's test using the MVN package
> result <- mvn(data, mvnTest = "mardia")
>
> # Print the test results
> print(result$multivariateNormality)
           Test         Statistic           p value Result
1 Mardia Skewness   50610.4225562569 0.0595350490840921    YES
2 Mardia Kurtosis -0.147993325169005  0.882348035980118    YES
```

Source: Own elaboration adapted from Selcuk et al (2014).

Appendix 8. solomon method to split dataset.

```
> ################################################################
> #
> #             S O L O M O N     R  C O D E
> #
> #               AUTHOR:   URBANO LORENZO-SEVA
> #                 URV, TARRAGONA (SPAIN)
> #                    DATE: 17/06/2021
> #
>
> #
> ################################################################
>
> ################################################################
>
```

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```
> filein <- "C:/Users/user/Desktop/proposal2/EFA CFA models/EFA pilot study/outliers/data fit/data430.dat"
> #
> #
> #     value 1: First subsample
> #     value 2: Second subsample
> #
> fileout <- 'final3061.dat'
> #
> ###################################################################
>
> ####################  SOLOMON CODE ############################
> X <- read.table(filein)
> N <- nrow(X)
> m <- ncol(X)
> mc <- colMeans(X)
> sx <- sqrt(colSums(X^2)/N - mc^2)
> ones <- as.matrix(numeric(N)+1)
> Z <- as.matrix((X - ones %*% mc)/(ones %*% sx))
> R <- cor(X)
> eigen <- eigen(R)
> ld <-1
> for (i in 1:m){
+   if (eigen$values[i] > 1) {
+     ld <- ld +1
+   }
+ }
> s <- svd(R)
> Kq <- as.matrix(s$v[1:m,1:ld])
> Dq <- as.matrix(diag(s$d[1:ld]))
> B <- Kq %*% solve(Dq)^(0.5)
> A <- t(solve(t(B)%*%R%*%B) %*% t(B) %*% R )
> A <- A * as.matrix(numeric(m)+1)%*%sign(colSums(A))
> pc_ld <- Z %*% A
> w <- eigen$values/m
> w_ld <- w[1:ld];
> s <- pc_ld %*% w_ld
> ss <- sort(s,method = "quick", index.return = TRUE)
> sss <- numeric(N) + 2
> pos <- seq(1,N,2)
> sss[pos] <- 1
> Xs <- X[ss$ix,]
> ids <- ss$ix
> SX <- t(rbind(t(sss),t(Xs)))
> colnames(SX)[1] <- c("SG")
> sid <- sort(ids,method = "quick", index.return = TRUE)
> solomon <- SX[sid$ix,]
> write.table(solomon, file=fileout, row.names=FALSE, col.names=FALSE)
> ####################  END OF SOLOMON CODE ######################
>
> print("#################################################################")
[1] "#################################################################"
> print("#                                                               ")
[1] "#                                                               "
> print("#          S O L O M O N     R   C O D E                        ")
[1] "#          S O L O M O N     R   C O D E                        "
> print("#                                                               ")
[1] "#                                                               "
> print("#             AUTHOR:   URBANO LORENZO-SEVA                     ")
[1] "#             AUTHOR:   URBANO LORENZO-SEVA                     "
> print("#                 URV, TARRAGONA (SPAIN)                        ")
[1] "#                 URV, TARRAGONA (SPAIN)                        "
> print("#                                                               ")
[1] "#                                                               "
> print("#                   DATE: 17/06/2021                            ")
[1] "#                   DATE: 17/06/2021                            "
```

```
> print("#                                                                  ")
[1] "#                                                                  "
> print("####################################################################")
[1] "####################################################################"
> print("#                                                                  ")
[1] "#                                                                  "
> print(paste("# Filein : ",filein,"    "))
[1] "# Filein :  C:/Users/user/Desktop/proposal2/EFA CFA models
/EFA pilot study/outliers/data fit/data430.dat  "
> print(paste("# Fileout: ",fileout,"    "))
[1] "# Fileout:  final3061.dat    "
> print("#                                                                  ")
[1] "#                                                                  "
```

Source: Own elaboration adapted from Lorenzo-Seva (2021).

Appendix 9. Initial draft questionnaire.

Dear Sir/Madam

I would like to invite you to participate in this survey, which will make an important contribution to the research on "Assessing the Adoption of e-Health Technology in the Jordan Health Care System: An Extension of the UTAUT Model", which I am undertaking for my PhD.

The data collected will be used primarily for my thesis and in generating publications for journals or conferences in relevant fields. In addition, data will also be shared in a collaborative research project if the opportunity arises.

There will be a time constraint in that completing the survey is expected to take around 15 minutes. Participation is entirely voluntary; there are no consequences for non-participation; no personally-identifying data will be captured; data will be anonymized; you can withdraw at any time; if so, then data captured up to that point will be securely deleted; and there are no consequences for withdrawing from the research. Please be assured that your responses will be treated as strictly confidential, and you will not be individually identified.

If you have any queries at all, please do not hesitate to contact me.

Thank you for taking the time to respond.

Student: Mohammad Alhur

Phone No. 07992051941.

Email: Mohammadsalemahmad.alhur@rai.usc.es

Do you use the "My Hakeem" app? 1: Yes (continue the questionnaire) 2: No (skip automatically)

Part 1 Demographic Data

1- What is your gender?

Male

Female

2- Which of these age groups are you in?

18-30

31-40

41-50

51 yrs. and over

3- What is your educational level?

Undergraduate

Postgraduate

5- how many times using e-Health portal?

1- Once times or less

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2- 2-3 times in week
3- More than 3 times
6- In the last three months, did you visit a doctor? 1-Yes 2- No
7- Have you been sick in the last three months? 1- Yes 2- No

Part 2 Items

Second Part	
Hedonistic motivation	
HM1	"my Hakeem" app contributes to the quality of life in Jordan
HM2	"my Hakeem" app is enjoyable for patients in Jordan.
HM3	"my Hakeem" app is pleasant for patients in Jordan.
Utilitarian motivation	
UM1	"my Hakeem" app is professionally recognized in Jordan.
UM2	"my Hakeem" app is economically viable.
UM3	"my Hakeem" app performs well in its core function.
UM4	If the information received through "my Hakeem" app is reliable it will promote use
Public Trust Value	
PTV1	I know that the "My Hakeem" services is honest.
PTV2	I know that the "My Hakeem" services cares about its patients.
PTV3	I know that the "My Hakeem" services is not opportunistic.
PTV4	I know that the "My Hakeem" services is predictable.
Ethical public value	
TPV1	"my Hakeem" behaves in decent way.
TPV2	"my Hakeem" is fair.
TPV3	"my Hakeem" acts ethically correct.
Social value	
SV1	"my Hakeem" contributes to social cohesion in Jordan.
SV2	"my Hakeem" creates a healthier community in Jordan.
SV3	"my Hakeem" has a positive effect on social relationships in Jordan.
Third part	
Perceived benefits	
PB1	I think that consulting the doctor through the "My Hakeem" app can save time.
PB2	I think that consulting the doctor via the "My Hakeem" app can offer me a wider range of medical knowledge.
PB3	I think that consulting the doctor via the "my Hakeem" app can save on costs.
Quality of eHealth delivery	
QHD1	"my Hakeem" provides assured services.
QHD2	"my Hakeem" provides services with empathy.
QHD3	"my Hakeem" provides responsive services.
Perceived usefulness	
PU1	I feel that using "my Hakeem" services can increase the efficiency of my doctor visits.
PU2	I feel that using "my Hakeem" services allow me to better manage my time when I seek medical care.

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PU3	I feel that using such “my Hakeem” services can make it easier for me to complete my medical appointments.
	Overall, I find it helpful to use “my Hakeem” services.
Empowerment of patients	
EP1	Because of the "My Hakeem" app, I know how to promote my health.
EP2	When I’m using the "My Hakeem" app It is easy for me to practice health-promoting behaviors in everyday life.
EP3	*I am well informed regarding my health condition, thanks to the "my Hakeem" app.*
EP4	*I am able to cope with my health problems because of the "My Hakeem" app.*
EP5	*I know different treatment options for my health problems because of the "My Hakeem" app.*
EP6	*When I use the "My Hakeem" app, I am able to prevent the deterioration of my health condition as much as possible.*
EP7	*When I use the "My Hakeem" app, I know when to seek medical or therapeutic help or when I can deal with my health problem myself.*
EP8	*I am able to get medical or therapeutic help when I need it, thanks to the "my Hakeem" app.*
EP9	*I have no difficulty telling my doctor about my concerns and fears through the "My Hakeem" app.*
EP10	When I use the "My Hakeem" app, it is easy for me to ask my questions or express my wishes during a medical consultation.
EP11	When I used the "My Hakeem" app, I became confident that I could maintain a healthy lifestyle even in stressful times.
EP12	In general, I am coping well with life, and that is because I'm using the "My Hakeem" app.
EP13	On the whole, I am able to look after myself, and that is because I'm using the "my Hakeem" app.
Social influence	
SI1	People who are important to me think that I should use “my Hakeem” services.
SI2	People who influence my behavior think that I should use “my Hakeem” services.
SI3	People whose opinions that I value prefer that I should use “my Hakeem” services.
eHealth justice	
HJ1	“my Hakeem” app is available at a national level.
HJ2	“my Hakeem” app is available in any non-official language.
HJ3	accessing the “my Hakeem” app via various means, such as a website, smartphone, and so on.
HJ4	In "My Hakeem," the ethical issue is transparency.
HJ5	*In "My Hakeem," the ethical issue is inclusiveness.*
HJ6	In "My Hakeem," the ethical issue is Equal Treatment
Privacy Concerns	
PC1	I am concerned that "My Hakeem" will over-collect my personal information
PC2	I am concerned that the personal information stored in "My Hakeem" app could be misused
PC3	I am concerned that "My Hakeem" app will leak my personal information to unauthorized third-party agencies
PC4	I am concerned that my personal information is at risk due to errors and omissions of data users
Forth section	
Implementation intention	
IMI1	If the "My Hakeem" app is useful, efficient, and beneficial, then I'll employ it in my daily life.
IMI2	If the "My Hakeem" app is fun and enjoyable, then I'll use it.
IMI3	If the "My Hakeem" app empowers me to deal with my health issues, then I'll use it regularly.
IMI4	If other patients use the "my Hakeem" app, then I'll use it as well.
IMI5	If the "My Hakeem" app provides privacy and justice policies, then I'll use it regularly.
IMI6	If I find the services of the "My Hakeem" app trustable, then I'll use it.

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Habit	
HB1	The use of the “my Hakeem” application has become a nice habit.
HB2	I am addicted to using the “my Hakeem” app.
HB3	I'll need to use the “my Hakeem” app.
HB4	Using the “my Hakeem” app has become natural to me.
Use behavior	
UB1	The “my Hakeem” app is a pleasant experience
UB2	I use the “my Hakeem” app currently.
UB3	I spend a lot of time on the “my Hakeem” app

Appendix 10. Final draft questionnaire.

Dear Sir/Madam

I would like to invite you to participate in this survey, which will make an important contribution to the research on "**Assessing the Adoption of e-Health Technology in the Jordan Health Care System: An Extension of the UTAUT Model**", which I am undertaking for my PhD.

The data collected will be used primarily for my thesis and in generating publications for journals or conferences in relevant fields. In addition, data will also be shared in a collaborative research project if the opportunity arises.

There will be a time constraint in that completing the survey is expected to take around 15 minutes. Participation is entirely voluntary; there are no consequences for non-participation; no personally-identifying data will be captured; data will be anonymized; you can withdraw at any time; if so, then data captured up to that point will be securely deleted; and there are no consequences for withdrawing from the research. Please be assured that your responses will be treated as strictly confidential, and you will not be individually identified.

If you have any queries at all, please do not hesitate to contact me.

Thank you for taking the time to respond.

Student: Mohammad Alhur

Phone No. 07992051941.

Email: Mohammadsalemahmad.alhur@rai.usc.es

Do you use the "My Hakeem" app? 1: Yes (continue the questionnaire) 2: No (skip automatically)

Part 1 Demographic Data

1- What is your gender?

Male

Female

2- Which of these age groups are you in?

18-30

31-40

41-50

51 yrs. and over

3- What is your educational level?

Undergraduate

Postgraduate

5- how many times using e-Health portal?

1- Once times or less

2- 2-3 times in week
3- More than 3 times
6- In the last three months, did you visit a doctor? 1-Yes 2- No
7- Have you been sick in the last three months? 1- Yes 2- No

Part 2 Items

Second Part (Organism)	
Hedonistic motivation	
HM1	"my Hakeem" app contributes to the quality of life in Jordan
HM2	"my Hakeem" app is enjoyable for patients in Jordan.
HM3	"my Hakeem" app is pleasant for patients in Jordan.
Utilitarian motivation	
UM1	"my Hakeem" app is professionally recognized in Jordan.
UM2	"my Hakeem" app is economically viable.
UM3	"my Hakeem" app performs well in its core function.
UM4	If the information received through "my Hakeem" app is reliable it will promote use
Public Trust Value	
PTV1	I know that the "My Hakeem" services is honest.
PTV2	I know that the "My Hakeem" services cares about its patients.
PTV3	I know that the "My Hakeem" services is not opportunistic.
PTV4	I know that the "My Hakeem" services is predictable.
Ethical public value	
TPV1	"my Hakeem" behaves in decent way.
TPV2	"my Hakeem" is fair.
TPV3	"my Hakeem" acts ethically correct.
Social value	
SV1	"my Hakeem" contributes to social cohesion in Jordan.
SV2	"my Hakeem" creates a healthier community in Jordan.
SV3	"my Hakeem" has a positive effect on social relationships in Jordan.
Third part (Stimulus)	
Perceived benefits	
PB1	I think that consulting the doctor through the "My Hakeem" app can save time.
PB2	I think that consulting the doctor via the "My Hakeem" app can offer me a wider range of medical knowledge.
PB3	I think that consulting the doctor via the "my Hakeem" app can save on costs.
Quality of eHealth delivery	
QHD1	"my Hakeem" provides assured services.
QHD2	"my Hakeem" provides services with empathy.
QHD3	"my Hakeem" provides responsive services.
Perceived usefulness	
PU1	I feel that using "my Hakeem" services can increase the efficiency of my doctor visits.
PU2	I feel that using "my Hakeem" services allow me to better manage my time when I seek medical care.
PU3	I feel that using such "my Hakeem" services can make it easier for me to complete my medical appointments.
	Overall, I find it helpful to use "my Hakeem" services.

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Empowerment of patients	
EP1	Because of the "My Hakeem" app, I know how to promote my health.
EP2	When I'm using the "My Hakeem" app It is easy for me to practice health-promoting behaviors in everyday life.
EP10	When I use the "My Hakeem" app, it is easy for me to ask my questions or express my wishes during a medical consultation.
EP11	When I used the "My Hakeem" app, I became confident that I could maintain a healthy lifestyle even in stressful times.
EP12	In general, I am coping well with life, and that is because I'm using the "My Hakeem" app.
EP13	On the whole, I am able to look after myself, and that is because I'm using the "my Hakeem" app.
Social influence	
SI1	People who are important to me think that I should use "my Hakeem" services.
SI2	People who influence my behavior think that I should use "my Hakeem" services.
SI3	People whose opinions that I value prefer that I should use "my Hakeem" services.
eHealth justice	
HJ1	"my Hakeem" app is available at a national level.
HJ2	"my Hakeem" app is available in any non-official language.
HJ3	accessing the "my Hakeem" app via various means, such as a website, smartphone, and so on.
HJ4	In "My Hakeem," the ethical issue is transparency.
HJ6	In "My Hakeem," the ethical issue is Equal Treatment
Privacy Concerns	
PC1	I am concerned that "My Hakeem" will over-collect my personal information
PC2	I am concerned that the personal information stored in "My Hakeem" app could be misused
PC3	I am concerned that "My Hakeem" app will leak my personal information to unauthorized third-party agencies
PC4	I am concerned that my personal information is at risk due to errors and omissions of data users
Forth section (Response)	
Implementation intention	
IMI1	If the "My Hakeem" app is useful, efficient, and beneficial, then I'll employ it in my daily life.
IMI2	If the "My Hakeem" app is fun and enjoyable, then I'll use it.
IMI3	If the "My Hakeem" app empowers me to deal with my health issues, then I'll use it regularly.
IMI4	If other patients use the "my Hakeem" app, then I'll use it as well.
IMI5	If the "My Hakeem" app provides privacy and justice policies, then I'll use it regularly.
IMI6	If I find the services of the "My Hakeem" app trustable, then I'll use it.
Habit	
HB1	The use of the "my Hakeem" application has become a nice habit.
HB2	I am addicted to using the "my Hakeem" app.
HB3	I'll need to use the "my Hakeem" app.
HB4	Using the "my Hakeem" app has become natural to me.
Use behavior	
UB1	The "my Hakeem" app is a pleasant experience
UB2	I use the "my Hakeem" app currently.
UB3	I spend a lot of time on the "my Hakeem" app
Fifth section (Marker variable)	
BA1	I prefer blue to other colors

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BA2	I like thecolor blue
BA3	I like blue clothes
BA4	I hope my next car is blue'

Appendix 11. Descriptive analysis for study's items.

Variables	N	Mean	Std. Deviation	Skewness	Kurtosis (Zero centered)
HM1	430	2.9512	1.03772	.136	.671
HM2	430	3.0279	1.06400	.108	-.680
HM3	430	3.3209	.96526	.008	-.678
UM1	430	2.9186	.91879	.108	-.506
UM2	430	2.9251	.89609	.108	-.341
UM3	430	2.8047	.87917	.122	-.270
UM4	430	2.7488	1.04989	.176	-.595
SV1	430	2.5070	1.08333	.121	-.912
SV2	430	2.1442	.75888	.118	-.301
SV3	430	2.3814	1.05717	.043	-.939
EPV1	430	3.0581	.94060	.171	-.451
EPV2	430	2.9581	.99795	.042	-.546
EPV3	430	2.8137	1.03874	.083	-.518
PTV1	430	3.0581	1.13766	-.065	-.780
PTV2	430	3.1326	1.11646	-.115	-.716
PTV3	430	2.9674	1.16979	-.070	-.812
PTV4	430	3.0798	1.17660	-.032	-.790
EP1	430	2.9451	.97579	.115	-.538
EP10	430	2.8996	.97816	.189	-.582
EP11	430	2.9493	1.01442	.062	-.474
EP12	430	2.9070	.87116	.050	-.490
EP13	430	2.8947	.92838	.192	-.469
EP2	430	2.9140	.71079	.156	-.460
EP3	430	2.9457	.99987	.131	-.495
EP4	430	2.9349	1.05576	-.049	-.659
EP5	430	2.9180	.94755	.091	-.446
EP6	430	2.6138	1.21006	.333	-.860
EP7	430	2.7101	1.18081	.378	-.762
EP8	430	2.5767	1.20698	.315	-.900
EP9	430	2.5791	1.18539	.262	-.878
SI1	430	2.8535	1.03073	.027	-.672
SI2	430	2.9326	1.06987	.112	-.655
SI3	430	2.7419	1.04262	.098	-.701
PB1	430	2.8698	1.17343	.037	-.853
PB2	430	2.9395	1.16917	.056	-.809
PB3	430	2.9256	1.14621	.044	-.765
PU1	430	2.8510	1.22634	.100	-.962
PU2	430	3.5535	.82540	.091	-.565
PU3	430	2.7767	1.20466	.260	-.806
PU4	430	2.3116	.72620	.364	.225
QHD1	430	2.1767	.82582	.260	-.507
QHD2	430	3.2047	1.06435	-.031	-.637
QHD3	430	2.1163	.76975	.353	-.009
HJ1	430	2.7233	1.05343	.127	-.653
HJ2	430	2.7860	1.03586	.210	-.447
HJ3	430	2.0116	.76482	.420	.012
HJ4	430	2.8163	.95406	.132	-.449

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HJ5	430	2.8418	.94421	-.019	-.479
HJ6	430	2.8581	1.01544	-.021	-.522
PC1	430	2.8833	1.03379	.196	-.456
PC2	430	2.9930	.94731	.064	-.445
PC3	430	2.8651	1.10538	.123	-.651
PC4	430	2.9558	.94383	.289	-.552
IMI1	430	2.7349	.96534	.068	-.640
IMI2	430	3.0953	.94251	-.023	-.555
IMI3	430	2.3651	.89244	.204	-.503
IMI4	430	2.9419	.92561	.045	-.454
IMI5	430	2.9977	1.17768	-.047	-.845
IMI6	430	2.9207	.98966	.160	-.487
HB1	430	2.8628	1.01837	.105	-.576
HB2	430	2.9535	.97888	-.041	-.530
HB3	430	2.8763	.99940	.079	-.555
HB4	430	2.7884	.99385	.234	-.455
UB1	430	2.9649	.94385	-.020	-.446
UB2	430	2.7953	.96076	.166	-.410
UB3	430	3.1186	1.14756	-.057	-.861

Source: Author

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Appendix 12. Unconstraint model and restricted model.

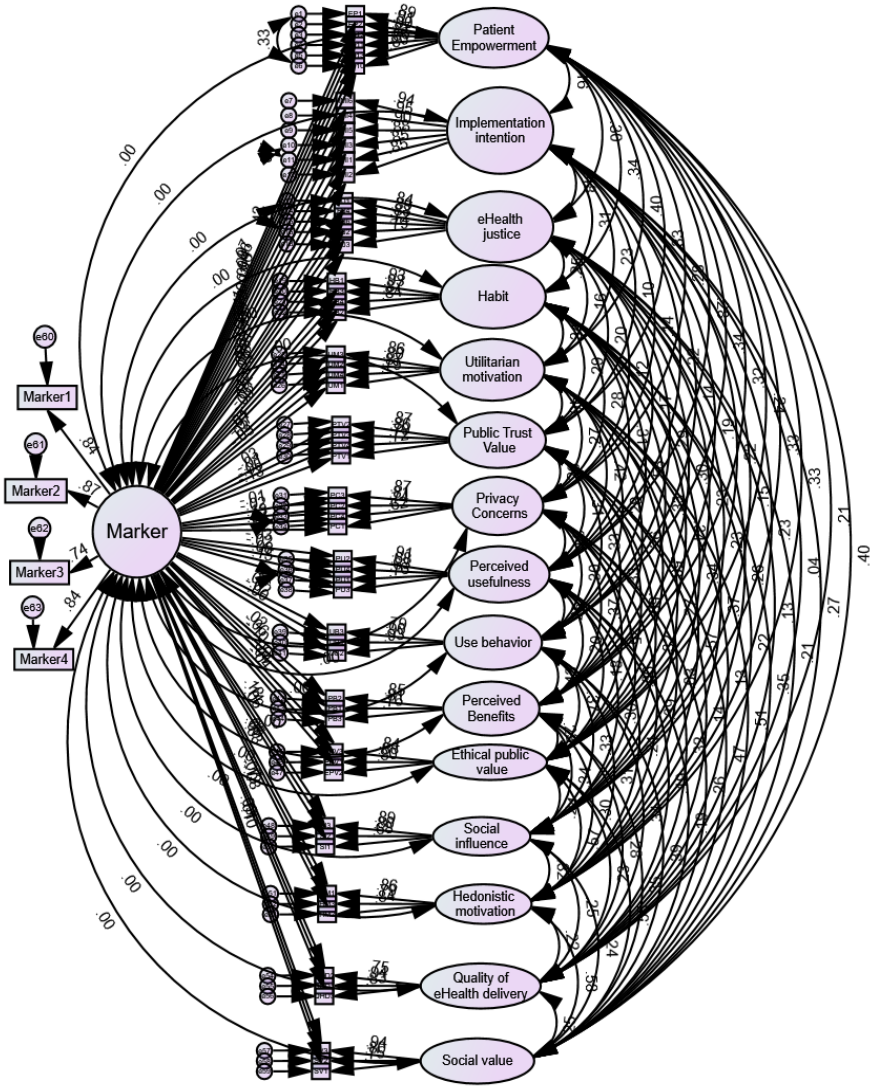

Figure 53. Unconstraint Model.
Source: Auther.

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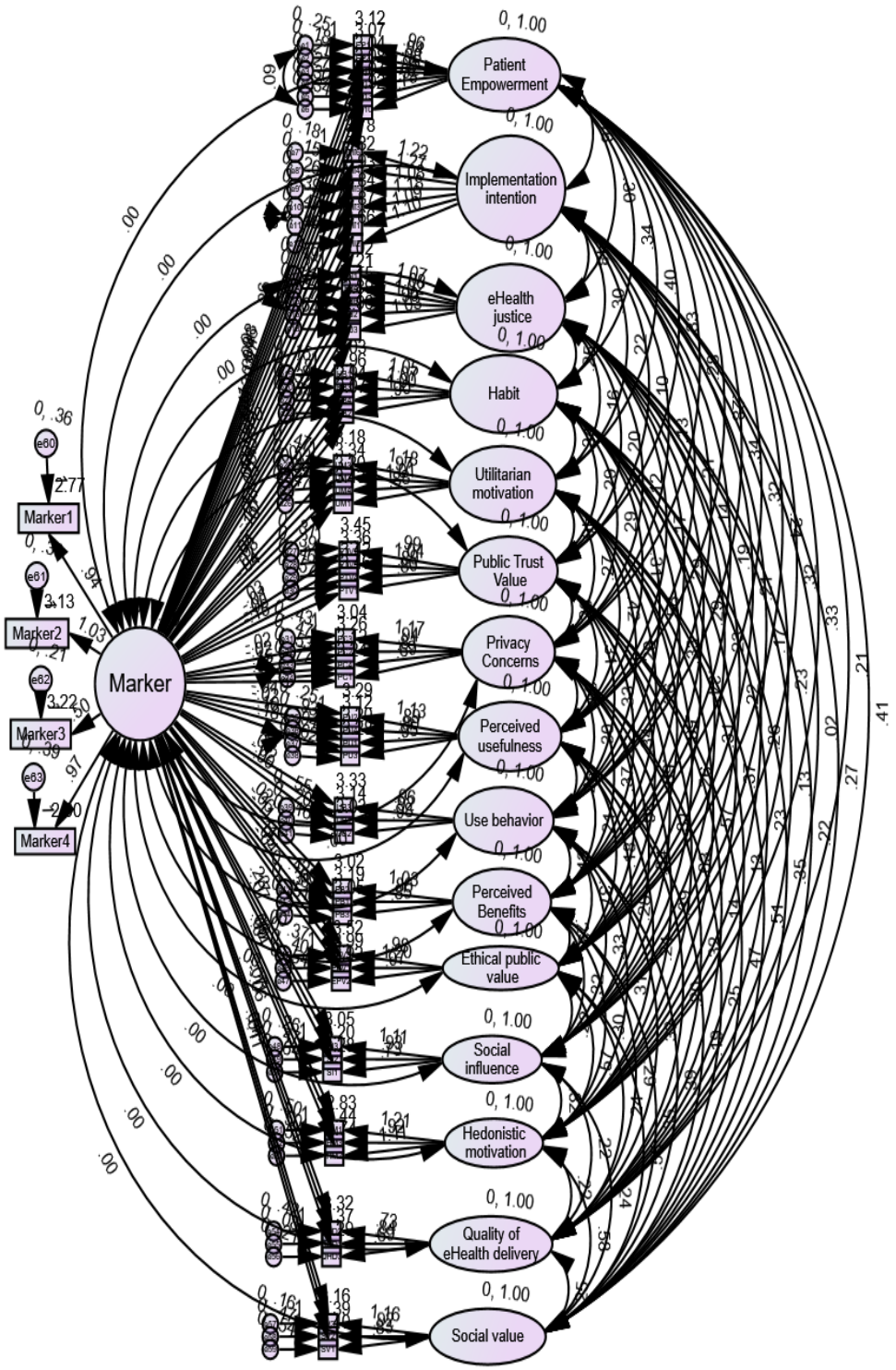

Figure 54. Restricted Model.
Source: Auther.

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Appendix 13. Summary of constructs with measurement items.

Constructs	Definition/conceptualization	Items	References
Hedonistic motivation	The value that patients place on pleasure while using an eHealth app and what it means to generate a positive experience by utilizing an eHealth application This value arises from the deeply ingrained evolutionary need to avoid pain and maximize pleasure in order to survive.	"my Hakeem" app contributes to the quality of life in Jordan "my Hakeem" app is enjoyable for patients in Jordan. "my Hakeem" app is pleasant for patients in Jordan.	(Meynhardt & Jasinenko, 2021)
Utilitarian motivation	Value ascribed to utility and what it means to create a benefit efficiently. Furthermore, utility-motivated consumers as "problem solvers" (goal-oriented activities such as gathering information, weighing evidence, and arriving at carefully considered judgments and evaluations)	- "my Hakeem" app is professionally recognized in Jordan. - "my Hakeem" app is economically viable. - "my Hakeem" app performs well in its core function. - If the information received through "my Hakeem" app is reliable it will promote use	(Ashraf et al., 2021; Meynhardt & Jasinenko, 2021)
Perceived benefits	The perception of the utility associated with eHealth services.	I think that consulting the doctor through the "My Hakeem" app can save time. I think that consulting the doctor via the "My Hakeem" app can offer me a wider range of medical knowledge. I think that consulting the doctor via the "my Hakeem" app can save on costs.	(H.-W. Kim et al., 2007; Zheng et al., 2021)
Quality of eHealth delivery	Patients' overall service performance associated with eHealth application services and quality of health outcomes for patients	"my Hakeem" provides assured services. "my Hakeem" provides services with empathy. "my Hakeem" provides responsive services.	(Busse, R., Klazinga, N., Panteli, D., & Quentin, 2019; Teisberg et al., 2020; Zheng et al., 2021)
Perceived usefulness	Perceived usefulness measures the extent to which patients believe that utilizing a specific system will improve their job performance	I feel that using "my Hakeem" services can increase the efficiency of my doctor visits. I feel that using "my Hakeem" services allow me to better manage my time when I seek medical care. I feel that using such "my Hakeem" services can make it easier for me to complete my medical appointments. Overall, I find it helpful to use "my Hakeem" services.	(Beldad & Hegner, 2018; Tu et al., 2022)
Social value	Value attached to social relationships and what it means to establish positive group relations	- "my Hakeem" contributes to social cohesion in Jordan. - "my Hakeem" creates a healthier community in Jordan. - "my Hakeem" has a positive effect on social relationships in Jordan.	(Meynhardt & Jasinenko, 2021)
Empowerment of patients	The process through which patients gain greater control over decisions and actions affecting their health through eHealth application	- Because of the "My Hakeem" app, I know how to promote my health. - When I'm using the "My Hakeem" app. It is easy for me to practice health-promoting behaviors in everyday life. -I am well informed regarding my health condition, thanks to the "my Hakeem" app. -I am able to cope with my health problems because of the "My Hakeem" app.	(Siegel et al., 2019; WHO, 2009)

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		-I know different treatment options for my health problems because of the "My Hakeem" app. -When I use the "My Hakeem" app, I am able to prevent the deterioration of my health condition as much as possible. -When I use the "My Hakeem" app, I know when to seek medical or therapeutic help or when I can deal with my health problem myself. -I am able to get medical or therapeutic help when I need it, thanks to the "my Hakeem" app. -I have no difficulty telling my doctor about my concerns and fears through the "My Hakeem" app. -When I use the "My Hakeem" app, it is easy for me to ask my questions or express my wishes during a medical consultation. -When I used the "My Hakeem" app, I became confident that I could maintain a healthy lifestyle even in stressful times. -In general, I am coping well with life, and that is because I'm using the "My Hakeem" app. - On the whole, I am able to look after myself, and that is because I'm using the "my Hakeem" app.	
Social influence	Perception of patients that how their associates believe about EHealth adoption	- People who are important to me think that I should use “my Hakeem” services. - People who influence my behavior think that I should use “my Hakeem” services. - People whose opinions that I value prefer that I should use “my Hakeem” services.	(Alam et al., 2021; Alshammari et al., 2021)
Ethical public value	Value ascribed to personhood and what it means to be human	“my Hakeem” behaves in decent way. “my Hakeem” is fair. “my Hakeem” acts ethically correct.	(Meynhardt & Jasinenko, 2021)
eHealth justice	Every patient has an equal opportunity to access similar services.	- “my Hakeem” app is available at a national level. - “my Hakeem” app is available in any non-official language. - accessing the “my Hakeem” app via various means, such as a website, smartphone, and so on. - In "My Hakeem," the ethical issue is transparency. - In "My Hakeem," the ethical issue is inclusiveness. - In "My Hakeem," the ethical issue is Equal Treatment	(Brall et al., 2019; Gerli et al., 2021; Jokinen et al., 2021; Rezaei et al., 2021)
Public Trust Value	Trust is recognized as a core value and a belief in the higher-order or more generalized schema of personhood, such as that the self is worthy and people are generally trustworthy. Trust possesses intrinsic value rather than serving solely as a means to an end. Also, trust and confidence in eHealth based on the perceived possibility of responding to requests, acting	I know that the "My Hakeem" services is honest. I know that the "My Hakeem" services cares about its patients. I know that the "My Hakeem" services is not opportunistic. I know that the "My Hakeem" services is predictable.	(Epstein, 2014; Meng et al., 2022; D. Wu et al., 2021)

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	in the best interests of the patients and reliably providing a service and meeting those obligations		
Privacy Concerns	Refers to the potential damage to privacy caused by patients' consent to provide personal information to eHealth providers.	I am concerned that "My Hakeem" will over-collect my personal information I am concerned that the personal information stored in "My Hakeem" app could be misused I am concerned that "My Hakeem" app will leak my personal information to unauthorized third-party agencies I am concerned that my personal information is at risk due to errors and omissions of data users	Khan et al., 2019; J. Tang et al., 2022
Patients' Public Value	The public value of patients is a multifaceted construct that emerges through the process of evaluation against their basic needs. It is comprised of interrelated but distinct dimensions, specifically hedonistic motivation, utilitarian motivation, social value, ethical value, and trust value	**Latent Variable**	(Chohan et al., 2021; Gerli et al., 2021; Meynhardt, 2019; Twizeyimana & Andersson, 2019)
Implementation intention	Linked critical situational cues (i.e., good opportunities to act, critical moments)to specific behavioral responses in an if-then format	If the "My Hakeem" app is useful, well organized, and beneficial, then I'll employ it in my daily life. If the "My Hakeem" app is fun and enjoyable, then I'll use it. If the "My Hakeem" app empowers me to deal with my health issues, then I'll use it regularly. If other patients use the "my Hakeem" app, then I'll use it as well. If the "My Hakeem" app provides privacy and justice policies, then I'll use it regularly. If I find the services of the "My Hakeem" app trustable, then I'll use it.	(L. Chen & Chen, 2022; P. M. Gollwitzer, 1999)
Habit	a neurologic pattern initially established through repetition, then initiated by a cue, resulting in automatic responses (automaticity) that are then manifested and acted upon through conscious recognition of the health impact of the response.	- The use of the "my Hakeem" application has become a nice habit. - I am habitual to using the "my Hakeem" app. - I'll need to use the "my Hakeem" app. - Using the "my Hakeem" app has become natural to me.	(Al-Azzam et al., 2019; Opalinski et al., 2018)
Use behavior	The Use Behavior measured from the actual frequency of a particular technology use	The "my Hakeem" app is a pleasant experience I use the "my Hakeem" app currently. I spend a lot of time on the "my Hakeem" app	(Hossain et al., 2019; M.-Y. Wu et al., 2012)

Source: Own elaboration adapted from references in table.

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The healthcare industry has been impacted by technological advancements, leading to the emergence of eHealth. However, patients are hesitant to embrace medical treatments through eHealth applications, which has caused a delay in the worldwide adoption of such applications. This empirical study aims to develop and validate an eHealth adoption model that focuses on patients' viewpoints and enables quantitative survey research. The study identifies strategies to enhance adoption, including addressing privacy concerns, empowering patients, promoting social support, ensuring eHealth justice, and upholding ethical standards. Overall, this study contributes valuable insights into eHealth adoption, paving the way for more effective healthcare technologies.