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Public value of using fintech services' mobile applications: Citizens' perspective in a Jordan setting

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ABSTRACT

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Measuring the performance of Fintech services on mobile apps (FSMA) is considered a major key to sustain, develop, and improve financial services and their processes, depending on users' standpoints on digital platforms. Public value aims at enhancing the performance of government institutions services. Throughout the current research, authors have suggested a novel way to evaluate the performance and management of FSMA by theorizing a new conceptual framework entitled Public Value of Fintech Services' Mobile Apps (PV-FSMA). A quantitative approach was chosen to measure several factors influencing the use of FSMA and evaluate the degree of public value of FSMA among Jordanians. The structural equation model was conducted based on the results of the PV-FSMA model hypotheses. The results confirmed that FSMA-intention to use (FSMA-ITU) and its predictors: FSMA-usefulness (FSMA-US), FSMA-awareness (FSMA-AR), FSMA-security (FSMA-SE), FSMA-social influence (FSMA-IS), and FSMA-system quality (FSMA-SQ) except FSMA-ease of use (FSMA-ES) are valuable determinants of PV-FSMA. The article presents theoretical implications regarding financial services and public value theories and practical implications regarding public institution leaders, managers, and information technology specialists in the Fintech domain to improve the quality and performance of FSMA in Jordan.

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1. Introduction

The advent of mobile technology has prompted both public institutions and private firms to adopt a novel strategy for deploying their services to users. Mobile applications have emerged as the preponderant preference among global mobile users across several scopes (Salameh et al., 2020). The proliferation of mobile technology has significantly enhanced the utilization of m-government applications and services, particularly in Jordan (Sami et al., 2018). Jordanian government institutions have turned their attention toward fintech services using mobile apps to generate public value among citizens of Jordan (Alhajjaj et al., 2022). However, using fintech services on mobile apps is considered a primary measurement in determining the degree of public value for government institutions and citizens in Jordan.

Financial technology (Fintech) is an intrinsic dimension of digital transformation technology that has changed the financial services platform. Developed fintech companies are creative intermediaries that use the recent forces of technology to modify business models and platforms, modify operational functions, and provide reinforced products and services (Firmansyah et al., 2022). However, the idiom of fintech can be defined as an advanced technology application for enhancing, deploying, and provisioning several financial services to businesses and users (Baber, 2020). Considering the literature studies in relative Fintech, there is an appeal to perform investigations in several contexts for identifying the factors influencing the usage of

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Fintech and determining theories that affect Fintech development and sustainability (Aggarwal et al., 2023; Mehta & Kumari, 2021). Working under Fintech literature is still insufficient, especially in developing countries such as Jordan (Alsmadi et al., 2022; Aljaafreh et al., 2022; Al-Afeef et al., 2023). Therefore, there is a lack of literature on Fintech, which prompts scholars, practitioners, and specialists to conduct additional empirical research to gain a comprehensive understanding of various Fintech applications (Thakor, 2020; Alsmadi et al., 2022). According to Alkhwalidi et al. (2022), present research suggests that the concept of fintech, is not solely determined by the involvement of the banking sector, financial companies, or government institutions but also by the insights and understanding of fintech users.

The public value theory is a framework used to assess, manage, and enhance the performance of organizations' services (Alford & O'Flynn, 2009), and it considers a contemporary topic that has added a comprehensive literature to use, sustain, and develop technologies (Alhajjaj et al., 2022). However, public value theory may provide a new insight to extend fintech usage and sustainability, particularly in a mobile setting. However, discovering users' information and knowledge regarding Fintech mobile apps in Jordan (like the Efwaterkom app) is assumed to be one of the best approaches to evaluating the performance of these apps (Alhajjaj et al., 2022), and provides more information and details for designing, developing, and enhancing processes of FSMA that may become more effective, increase usability, and guarantee sustainability (Khuong et al., 2022). In this context, several information system theories and models have been applied to measure the level of users' public value of using technology, such as the information success model, TAM, and further (Scott et al., 2016). As a result, the current study will provide a different perspective to evaluate the usage of Fintech mobile apps and determine the level of public value of these apps from the citizens' point of view in Jordan by selecting the most influential factors from several information system theories. Based on the authors' knowledge of this research, there is no empirical study combining fintech and public value theories.

Therefore, the present study offers numerous contributions to the fields of Fintech and public value theory (Vives, 2017). The primary contribution of the new study lies in its endeavor to establish a connection between Fintech and the notion of public value, specifically in the context of mobile applications deployed in Jordan (Scott et al., 2016; Varga, 2017). Additionally, it introduces a novel conceptual framework that can serve as a foundational reference for developers, designers, programmers, scholars, and policymakers involved in the development of Fintech mobile applications, aiding them in their respective development endeavors. Additionally, the empirical findings of the proposed model are anticipated to offer a pragmatic perspective on citizens' perceptions of Fintech mobile app usage in Jordan. These insights might potentially serve as valuable resources for app managers, enabling them to improve the overall performance of their apps. The ongoing research being conducted in developing nations, represented in Jordan, aims to explore and analyze the significant implications of utilizing Fintech mobile applications in terms of their public value.

2. Fintech Services Apps in Jordan

The modernization of financial transaction systems has accelerated monetary transactions, caused ripple effects and contributed to economic growth. Emerging economies have made notable advancements in fintech transactions due to the evolution of digitalization. Mobile fintech services have proven to be convenient and cost-efficient for low and middle-income individuals in Jordan (Aloulou et al., 2023). Mobile Fintech services refer to electronic money services that utilize mobile accounts to record and track an individual's funds on an electronic ledger. Transactions are conducted using either mobile phones or digital processes to ensure their authenticity. Financial services have been introduced to citizens of Jordan through several methods such as electronic channels and mobile apps by public sector institutions, the private sector, and the banking sector.

In 2014, the Jordanian government developed a smartphone application with the aim of facilitating financial operations for governmental organizations and citizens of Jordan. The smartphone application known as Efwaterkom serves as a representation of the FSMA in the present research. The management of the Efwaterkom app is allocated to the Central Bank by the government of Jordan (cbj.gov.jo, 2023). The Efwaterkom app offers a range of services, including the ability to make payments for electric usage and shopping transactions. However, conducting investigations in terms of FSMA setting is welcoming to determine the use level of these mobile apps that could assist the relative scholars and specialists to improve the current FSMA and produce new financial app packages for citizens (Al-Okaily et al., 2023; Rahi et al., 2023). In more detail, measuring the factors that influence these apps' adoption through applying the theory of public value expects to enhance Fintech mobile apps' performance and recognition.

3. Literature review

3.1. Public Value Theory Overview

According to Fukumoto and Bozeman (2018), it has been proposed that public value is a nebulous concept because scholars and academics predominantly suggest different explanations and definitions of it. Alford & O'Flynn (2009) define public value as an approach to manage and measure the performance of government institutions services. Coats and Passmore (2007) suggest that the term public value is the analog of the willingness to increase the value of shareholders in private organizations. The outcome, trust, and services are theorized as the primary keys to generating public value, as suggested by Kelly et al.

(2002). However, Meynhardt (2009) reveals, “public value from a management perspective, shifts the focus of value creation from a narrow financial-economic performance perspective to a broader concept of value creation that maintains and influences individual well-being as well as societal progress. In this sense, public value redefines the whole nation of value creation”. Therefore, Scott et al. (2016) state that the theory of public value should be categorized into three dimensions; which are the efficiency dimension, the effectiveness dimension, and the social value dimension.

A few empirical studies have measured the public value of using information technology systems in several contexts. In their study, Arslan et al. (2022) conducted a qualitative investigation by carrying out open-ended interviews with specialists in fintech services and four individuals engaged in entrepreneurial activities. The main discovery of this research is that fintech services possess the capacity to generate social value through the enhancement of fintech services for entrepreneurs and customers. By enhancing fintech service applications, businesses and users can potentially maximize their public value. This can be achieved through the improvement and development of the efficiency, effectiveness, and social value of fintech services. However, it has been revealed that public value is created by organizations' orientations toward presenting services to the public, the way they allocate services to confirm specific findings, the execution method of strategic planning, and developed processes appropriate to the value of users (Xanthopoulou, 2020). According to Leong and Sung (2018), there is a potential for Fintech services to create value for organizations and businesses through enhancements in several categories of Fintech apps, such as payment systems, advising services, financing solutions, and compliance measures. The extent of these improvements is contingent upon the most recent advances in the field of technology, particularly in the realm of mobile apps.

Based on the description, there is a dearth of empirical evidence in the field of public value theory, particularly in the context of FSMA (Alhanatleh et al., 2022). Hence, the current study aims to enhance the public value of mobile Fintech applications in Jordan through the optimization of their effectiveness and efficiency for users, as well as the elevation of their social value.

3.2. Fintech Studies in Global and Jordan Literature

Fintech has engendered an emerging technology that has developed, changed, and re-engineered the finance processes in organizations to present finance services for consumers. Vives (2017) defines fintech as employing apps, procedures, or business models to serve the industry of financial services and using the power of the internet or mobile technology to introduce several financial services for users through mobile apps or websites. Varga (2017) stated that fintech has been researched recently in business to depict the challenges and obstructions of the financial services industry to produce rapid, inexpensive, and effective financial services. The idiom of fintech has recently been studied in a literature review (Khuong et al., 2022). The adoption and intention to use Fintech have been drawing the attention of scientists in the field of financial services. The investigations in relevant literature have employed several information systems models to discover the fintech service usage in Jordan and multiple nations around the world, such as the unified theory of acceptance and use of technology (UTAUT and UTAUT2). The technology acceptance model (TAM), the value-based adoption model (VAM), the theory of reasoned action (TRA), the technological, organizational, and environmental influence (TOE), the conceptualized task technology fit (TTF), and the diffusion of innovation (DOI). Table 1 breaks down the research for describing the users' behavior toward fintech services in relevant literature in the field of the present study.

Table 1
Articles in adoption and usage of Fintech

Reference paper	Design & type of paper	Theory	Nation	Outcomes (+): significant, (-) : not
Chan et al. (2022)	Quantitative & empirical evidences	UTAUT	Australia	(+): performance expectancy, effort expectancy, and social influence. (-): perceived risk factor
Ngo & Nguyen. (2022)	Quantitative & empirical evidences	TAM	Vietnam	(+): consumer latent needs for Fintech service and consumer knowledge factors.
Hasan et al. (2021)	Quantitative & empirical evidences	TAM	Netherlands	(+):ES, US, safety and, trust
Tang et al. (2020)	Quantitative & empirical evidences	Selected factors	Malaysia	(+): financial, legal, and operational risk factors
Al-Afeef et al. (2023)	Quantitative & empirical evidences	TRA	Jordan	(+): seamless transactions and risk factors (financial, legal, security, and perceived risk).
Marei et al. (2023)	Quantitative & empirical evidences	TOE	Jordan	(+): TOE dimensions on Fintech use. (+):TOE dimensions on financial performance.
Aljaafreh et al. (2022)	Quantitative & empirical evidences	extended UTAUT2	Jordan	(+):extended UTAUT2 Dimensions, electronic word of mouth (eWOM) and COVID-19 pandemic risk.
Al Nawayseh (2020)	Quantitative & empirical evidences	UTAUT	Jordan	(+):perceived benefits and Fintech apps social influence. (-):Fintech apps risk.
Alalwan et al. (2017)	Quantitative & empirical evidences	UTAUT2	Jordan	(+):Fintech mobile apps performance expectancy, Fintech mobile apps effort expectancy, Fintech mobile apps hedonic motivation, Fintech mobile apps price value and Fintech mobile apps trust

In accordance with Table 1, it has been noted that there have scarcely been studies conducted to identify the factors that influence the users' adoption or use of fintech services in Jordan and other global nations. Moreover, Carlin et al. (2017)

discover that using mobile apps to perform personal financial activities provides benefits for users but also brings a possible risk when utilizing Fintech products. Thus, connecting the PV theory to FSMA suggests providing a new vision for maximizing the public administration's benefits of FSMA usage and increasing citizens' interests. As a result, prior empirical investigations have been conducted to aid with policymakers, analysts, developers, and designers of fintech services apps to enhance financial services platforms regarding the internal finance processes of organizations and external parties of organizations like consumers, suppliers, and stockholders. However, based on the authors' knowledge and experiences, the connection between public value theory and fintech app usage does not take place in the relative literature. Throughout the current investigation, it is embarking to measure the public institutions service performance by linking the public value theory and Fintech mobile apps' use from the citizens' point of view in Jordan.

3.3. Theoretical Background of the Research Proposed Model

As supported by empirical investigations regarding public value and Fintech services, many researchers confirmed their developed models depending on several frameworks related to information systems. More specifically, to have a full explanation concerning users' acceptance of information systems or new technology, scholars have constructed abundant information technology theories. These information technology models have empirically been measured such as Theory of Reasoned Action (TRA) was constructed and empirically supported by (Fishbein & Ajzen, 1977). TAM was created by (Davis, 1989) and empirically confirmed by (Venkatesh & Bala, 2008), UTAUT was established (Venkatesh 2003), and supported empirical evidence by (Dwivedi et al., 2020), IS model was built by (DeLone & McLean 2003) diffusion of innovations theory (DOI) was founded by (Rogers, 1975; Rogers, 2010), and theory of planned behavior (TPB) was created by (Ajzen, 1980; Ajzen, 1991) and empirically confirmed by (Petter et al., 2013).

In the context of adopting the variables affecting the public value of FSMA within the current research, a different approach was used to determine the consumers' level of use of FSMA by selecting the current study's factors depending on various theories of information technology. Firstly, FSMA-AR has been selected from DOI framework. Relying on Reddick & Zheng (2017), the FSMA-AR must be at the highest scale of the probability for users to commence the highest scale level of touch with the FSMA. Furthermore, FSMA-SI (sometimes called the subjective norm), has been taken from theories of TPB and UTAUT. In the current study, FSMA-SI was confirmed to have a considerable effect on users' attitudes toward the usage of the FSMA. In addition, there is an extra dimension to the adoption or intention to use of the FSMA, which is FSMA-SE. According to (Hartono et al., 2014), Fintech FSMA-SE dimension is the degree level of users' feeling to execute their transaction through FSMA provide a confidential approach engaged with customers' assumptions. In addition, FSMA -ES and FSMA-US dimensions have been chosen from TAM framework. These two dimensions have widely been researched in the context of using information systems (Ngo & Nguyen, 2022) and are expected to provide a considerable role to determine the users' degree of adopting FSMA in the current investigation. Furthermore, FSMA -SQ have been nominated to be a critical factor that may increase the users' degree of using FSMA (DeLone & McLean 2003). framework by Scott et al. (2016) that claimed the intention to use of specific technology provides a significant and positive impact in creating a public value depending on IS model (DeLone & McLean 2003). As a result, the current research suggests that FSMA- ITU can measure the PV of FSMA.

Based on the prior justified explanation, this manuscript has employed robust theoretical frameworks (DOI, TPB, UTAUT, TAM, and IS) to determine the popular common factors influencing FSMA-ITU and generate the PV of FSMA in related literature. FSMA-ES, FSMA-US, FSMA-AR, FSMA-SE, FSMA-SI, and FSMA-SQ will be critical dimensions for estimating and measuring FSMA-ITU. The originality of the current research is that both FSMA-intention to use and its antecedents may provide a considerable role to generate value for the public. Based on that, the authors suggest that FSMA-ITU has a sonorous connection to creating the PV of FSMA.

3.4. Developed Research Model

Depending on the previous subsections' discussion, the literature review of Fintech services and public value platforms indicated that several related frameworks have been conducted to explore the acceptance, adoption, or use of information technology like DOI, TPB, UTAUT, TAM, and IS (Scott et al., 2016; Ngo & Nguyen, 2022; Alalwan et al., 2017; Khuong et al., 2022; Chan et al., 2022). Therefore, the suggested model of the current research differs from previous frameworks for many reasons. The current investigation contributes by offering a robust, justified conceptual framework with a new perspective for integrating the FSMA and public value theory to measure the performance degree and management processes of government mobile apps for Fintech services, depending on the public standpoint of Jordan. However, the combination between FSMA and public value theory has not been investigated and addressed yet. As a critical contribution, the findings regarding the current article consider original information for policymakers of government financial services. Another pivotal novelty is using different approaches to conceptualize a new formwork regarding the Fintech services, which is considered a considerable method to provide the government administration with a new evaluation method for sustaining the use of FSMA and increasing their performance. Lastly, the developed model contributes to existing and relative formworks by connecting the FSMA-use and their public value. However, the antecedents of the public value of FSMA have been elected based on well-justified literature in a relative context. Fig. 1 presents the newly developed conceptual framework regarding the public value of FSMA.

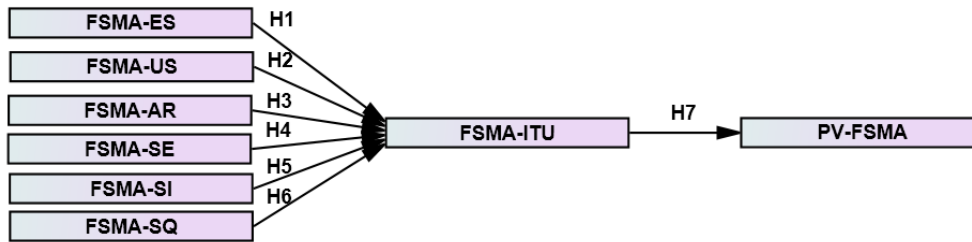


Fig. 1. PV-FSMA model.

3.4.1. Determinants of FSMA-ITU

The relationship between TAM Determinants and FSMA

TAM considers the most important theories that are used to identify the consumers' intention to use Fintech services. TAM was established depending on users' attitudes with two dimensions namely; ES and US toward behavior of using or adopting technology (Davis, 1989) and has been exceedingly confirmed in information technology literature. In accordance with (Davis, 1989), TAM was created to identify the acceptance, adopting, or use of a degree of a particular technology (AlKailani, 2016). In terms of TAM dimensions, Davis (1989) defines the US dimension as a citizen believes that utilizing a FSMA would assist for accomplish his daily practices and reinforce his performance; while the ES dimension as a citizen believes using a FSMA would minimize the effort. Scholars and researchers have expensively applied the TAM model in several information technology settings such as e-learning, teleconferencing, and short message service (Alhanatleh & Akkaya, 2020; Cheung & Vogel, 2013; Park et al., 2014; Muk & Chung, 2015; Wu & Chen, 2017) and found that ES and perceived US provide a considerable influence toward ITU of technology. In the context of Fintech services, ES and US have an ability to provide a significant role in the ITU of Fintech services (Ngo & Nguyen., 2022; Hasan et al., 2021). Accordingly, the authors conceptualize the first and second hypotheses in the current research, as follows:

H₁: *FSMA- ES will provide a significant influence on FSMA- ITU in Jordan.*

H₂: *FSMA- US will provide a significant influence on FSMA- ITU in Jordan.*

The relationship between FSMA-AR and FSMA- ITU

FSMA-AR considers a fundamental dimension for public to decide to download the Efwaterkom app on their smart devices to benefit from this app (Kamarudin et al., 2021). Researchers and scholars have widely employed awareness in various information systems such as mobile government apps, and mobile apps usage (Hammouri et al., 2021; Saprikis et al., 2021). In the context of the current article, many scholars confirmed that FSMA-AR supports an affirmative and significant impact of FSMA- ITU as asserted by (Reddick & Zheng, 2017). As a result, the current paper authors shape the third hypothesis, as follows:

H₃: *FSMA-AR will provide a significant influence on FSMA- ITU in Jordan.*

The relationship between FSMA-SE and FSMA- ITU

FSMA-SE theorizes as a critical success variable of Fintech services use. In accordance with Hartono et al. (2014), it explains the citizen's feel regarding performing their transactions on Efwaterkom app is highly extremely secure which is congruent with their confidence to do so. Empirical investigations disclose that security considers a major dimension for embracing and using new information systems like electronic banking services, electronic government services, and mobile government services (Liao & Cheung, 2002; Munyoka & Maharaj, 2019; Fox et al., 2021). In terms of the current study, the empirical findings uncover that FSMA-SE has a considerable effect on FSMA- ITU as confirmed by (Al-Afeef et al., 2023). Consequently, the current paper authors form the fourth hypothesis, as follows:

H₄: *FSMA-SE will provide a significant influence on FSMA- ITU in Jordan.*

The relationship between FSMA-SI and FSMA- ITU

FSMA-SI is another primary factor for evaluating the degree of FSMA usage. Understanding the contributions of surrounding environments such as family, close friends, residents, and stakeholders is considered a decisive matter to decide of using information technology. Prior empirical studies asserted that social influence has a powerful impact to improve the level of technology usage in several settings for example, electronic government services and online courses system as supported by (Abu-Shanab & Haider, 2015; Wu & Chen, 2017). In the current study, FSMA-SI has the capacity to be a major deterrent of

FSMA- ITU as asserted by (Al Nawayseh, 2020; Bouteraa et al., 2023; Chan et al., 2022; Singh et al., 2020). Therefore, the current paper authors form the fifth hypothesis as follows:

H₅: *FSMA-SI will provide a significant influence on FSMA- ITU in Jordan.*

The relationship between FSMA-SQ and FSMA- ITU

FSMA-SQ is an additional valuable factor that targets at appearing the FSMA counting on multiple features such as ease of use of financial services using mobile apps, user-friendly of FSMA, and high of usability (DeLone & McLean, 2003; Wang & Liao 2008). FSMA-SQ is considered as a primary determinant to measure the FSMA- ITU (Suh et al, 2017) and as a considerable antecedent to evaluate the PV of FSMA (Ellison et al., 2016). Through the current research, FSMA-SQ provides an influential role to empower the FSMA- ITU as confirmed by (Bouteraa et al., 2023). Thus, the current paper authors conceptualize the sixth hypothesis, as follows:

H₆: *FSMA-SQ will provide a significant influence on FSMA- ITU in Jordan.*

3.4.2. The Nexus between FSMA- ITU and PV

FSMA- ITU is a master variable in IS framework to estimate and measure the net benefit of financial services as proposed by (DeLone & McLean 2003). Depending on Petter et al. (2013), FSMA- ITU factor estimates the citizens' behavioral attitude and their tendency relying on the frequent use and the future willingness for using FSMA. As suggested by Scott et al., (2016), there is a robust connection between information technology use and public value theory for evaluating performance as empirically confirmed by (Agbabiaka, 2018). Following the same scenario, the current research argues that FSMA- ITU can generate or increase the PV of FSMA. As a result, it can be hypothesized that:

H₇: *FSMA- ITU will create a PV of FSMA in Jordan.*

4. Methodology

Choosing a proper methodology is considered the most critical step to match the current research objectives and purpose. Throughout this study, the employed methodology is a quantitative design. The quantitative method has been accomplished through applying several sequences of stages. In the first place, a comprehensive literature review regarding Fintech services, FSMA, and public value theory was founded. Afterwards, the conceptual framework of public value and FSMA was established based on a robust justification from relevant literature. After that, data were collected, depending on the instrument developed for the study, from citizens of Jordan. Later on, the cleaned data were subjected to SPSS AMOS package version 22 to obtain the results of the current research. Finally, the results were discussed, and the crucial implications illustrated.

To provide empirical evidence regarding the PV-FSMA model and its justified hypotheses in the current study, an online questionnaire was generated depending on the Google website. To reach the citizens of Jordan for responding to the questionnaire, the link was deployed across electronic and digital channels like social media apps (ex., the Facebook app, the WhatsApp platform). For deciding the method of collecting data and determining the number of participants in the current study, the convenience method is considered a proper style for accomplishing the objectives of our study. Cohen et al. (2017) indicate that convenience design provides several features for researchers, such as the ease of reaching Jordanian citizens using FSMA, its cost-effectiveness, and its ability to return responses rapidly. Although the convenience mechanism has some determinations, it suggests being adequate for conducting exploratory studies, as the present investigation suggests.

Table 2

Developed constructs items of the current study

Construct	Items #	Reference
FSMA -ES	4	(Winarno et al., 2021; Davis, 1898)
FSMA-US	4	(Winarno et al., 2021; Davis, 1898)
FSMA-AR	4	(Althunibat et al., 2014)
FSMA-SE	3	(Althunibat et al ,2021; Shareef et al ,2014)
FSMA-SI	4	(Winarno et al., 2021; Venkatesh & Bala, 2008)
FSMA-SQ	6	(Althunibat et al., 2014)
FSMA-ITU	4	(Wang & Liao, 2008; Hassanzadeh et al., 2012)
PV-FSMA	19	(Scott et al., 2016)

The sophisticated model of this study included eight variables extracted from exogenous and endogenous constructs that have been measured by prior investigations. The questionnaire was harnessed as an instrument for gathering the citizens' opinions on using FSMA in Jordan. The questionnaire, composed of 48 items, was adopted and developed in accordance with the relevant literature. The model constructs and the number of their items are clarified with literature review justification in Table 2. The items' constructs of the public value-FMSA model are scaled depending on 5-Likert starting from strongly disagree to strongly agree for measuring the constructs of the items. Before collecting data from the citizens of Jordan, the items of constructs were primarily translated from the English language to the Arabic language by inviting four scientists in linguistic scope. The translation process has been aimed at reducing the errors and vagueness of constructed items and minimizing the common bias method. In addition to, Yu et al. (2010), the first draft of the questionnaire was pre-examined by asking 25

citizens who use the Efwaterkom app in Jordan to ensure the validity of the questionnaire. The feedback and remarks from the pilot study were useful in preparing the final version of the questionnaire for gathering data purposes by modifying a small number of items to increase the readability and lucidity of the items.

To fulfill the aims and objectives of the current research, Jordanian citizens were asked to provide their information and knowledge about FSMA (the Efwaterkom app) through technology channels. 600 questionnaires were distributed. 526 citizens were accepted to respond to the questionnaire, with a rating of 87%. The valid responses used in the analysis stage were 495, with a rating of 82%. Hair et al. (2019) confirm that 495 respondents are sufficient to run the structural equation model.

5. Data Analysis

For examining the PV-FSMA model of the current research, several techniques have been sequentially carried out using two popular software packages, namely, SPSS and AMOS-22, due to their ability to provide high-accuracy outcomes as recommended by Ringle et al. (2020). Supplying reliable results from the PV -FSMA model requires various techniques, as supported by Hair et al. (2007). Starting with SPSS software, data were prepared depending on encoding, unengaged value, and missing value. Moreover, the skewness was computed, and the outliers among respondents were calculated. Shifting to AMOSS-22 software, it starts with the confirmatory factor analysis mechanism for measuring the PV-FSMA model validity and ends with SEM for evaluating the hypotheses and results of the current research.

5.1. Demographics Profile

Table 3 presents the pertinent characteristics of Jordanian citizens who took part in the present study, utilizing the FSMA. The sample size of Jordanian participants in this study is 495. According to the findings of the descriptive statistics, the variable gender consists of two distinct categories. Specifically, the male category represents 55.2% of the sample, while the female category accounts for 44.8%. Furthermore, the age variable is classified into four distinct categories. The category that exhibited the highest level of participation was the (31-40 years) range, accounting for (45.5%) of the total. The final aspect under consideration is education, which categorizes into five groups. Among these, the most prevalent group is individuals who have obtained a Bachelor's degree, comprising 58% of the total participants.

Table 3
Profile of Jordanians using FSMA (N=495)

Demographic characteristic	Criteria	Freq	%
Gender	Male	273	55.2
	Female	222	44.8
Age	<= 30 years	112	22.6
	31- 40 years	225	45.5
	41- 50 years	97	19.6
	> =51 years	61	12.3
Education	Diploma or less Secondary school	72	14.5
	Bachelors	287	58.0
	Postgraduate	136	27.5

5.2. CFA measurement

Executing the CFA is a required step in the analysis. The CFA should be implemented to indicate the validation of the PV -FSMA model instrument to ensure the analysis progresses on the right path. The tests of convergent validity, construct validity, and discriminant validity shape the CFA, as emphasized by Awang (2014). As the initial step for measuring the PV-FSMA model, all construct items have been subjected to CFA progress to ensure the model fit indices. Raza & Awang (2020) assure that constructs items should meet the factor loading accepted value (≥ 0.6) and the value of covariance correlation should be (< 0.85). In the case of applying these conditions, the items that satisfy the accepted value of factor loading will be obtained to be used in further analysis, and the multi-collinearity matter will not be provided. However, many items were overthrown from several constructs (SI4 from FSMA-SI; ITU1 from FSMA-ITU; and Pv1, Pv6, Pv8, and Pv18 from PV-FSMA). As a result, the multi-collinearity matter did not exist, and due to the correlation between all items in the measure, ring the PV-FSMA model, it did not exceed the required value (< 0.85). Table 4 confirms the factor loading values for all construct items and presents noticeable evidence to conduct further steps of the current analysis.

For estimating the convergent validity of the PV-FSMA model, the indicators of the measurement model and the Average Variance Extracted (AVE) were assessed. The synopsis of the discriminant validity indices was measured to evaluate and confirm the issues of discriminant and convergent validity of the PV-FSMA model, as affirmed by Hair et al. (2010). To estimate the constructs' reliability, the composite reliability (CR) measurement was inspected, where Kashif et al. (2016) proposed that the CR's measurements substituted the Cronbach Alpha's measurements. According to the data presented in Table 4, the results of the current study revealed that the calculated values for CR and AVE met the established thresholds of 0.50 and 0.60, respectively, as stated by Mohamad et al. (2019). Therefore, the current study highlights the significance of two key measurements, namely composite reliability and convergent validity, in assessing the PV-FSMA model.

Table 4

PV-FSMA model constructs loaded items

Construct label	Coded Items	Loaded Items	CR	AVE	Mean	Std
FSMA- EU	EoU1	0.83	0.90	0.70	3.76	0.95
	EoU2	0.91				
	EoU3	0.73				
	EoU4	0.85				
FSMA- US	PU _s 1	0.84	0.89	0.67	3.27	1.21
	PU _s 2	0.79				
	PU _s 3	0.88				
	PU _s 4	0.76				
FSMA- AR	AR1	0.74	0.83	0.56	2.53	0.84
	AR2	0.85				
	AR3	0.75				
	AR4	0.63				
FSMA- SE	SEC1	0.70	0.84	0.64	2.31	0.82
	SEC2	0.87				
	SEC3	0.82				
FSMA- SI	SI1	0.87	0.90	0.74	3.17	1.22
	SI2	0.91				
	SI3	0.80				
FSMA- SQ	SQ1	0.79	0.94	0.71	2.43	0.83
	SQ2	0.88				
	SQ3	0.82				
	SQ4	0.82				
	SQ5	0.87				
	SQ6	0.87				
FSMA-ITU	ITU2	0.85	0.89	0.74	2.96	1.03
	ITU3	0.90				
	ITU4	0.83				
PV-FSMA	Pv2	0.65	0.96	0.61	2.76	0.90
	Pv3	0.73				
	Pv4	0.70				
	Pv5	0.64				
	Pv7	0.69				
	Pv9	0.83				
	Pv10	0.80				
	Pv11	0.83				
	Pv12	0.72				
	Pv13	0.79				
	Pv14	0.83				
	Pv15	0.84				
	Pv16	0.88				
	Pv17	0.80				
Pv19	0.80					

In terms of PV-FSMA model fit, Awang (2015) indicates that incremental fit (I-fit), parsimonious fit (P-fit), and absolute fit (A-fit) format the model fit. Table 5 classifies all indicators of each type of model fit, including their threshold, as suggested by Awang (2015). According to Isah et al. (2023), many investigations in the literature utilized the bold indices to judge the weather of model fit, as clarified in Table 5. Following the same method, the current research recognized the bold indicators in Table 5 to evaluate the model fit indices as sufficient for judgment. Accordingly, the PV-FSMA model supported model fit indicators.

Table 5

PV-FSMA Model fit classifications and their accepted values.

Classification name	Indicators	Significant value
A-Fit Index	RMSEA = 0.056 GFI =0.851	If RMSEA is less than 0.08, it will satisfied. GFI is less than 0.85, it will satisfied or if GFI is greater than 0.90, it will be ideal.
I-Fit Index	AGFI =0.808 CFI = 0.929 TLI =0.922 NFI = 0.888	If I-fit indicators are greater than 0.85, it will be satisfied or if I-fit indicators are greater than 0.90, it will be ideal.
P-Fit Index	ChiSq /df =2.533	If Chi-Square/df is less than 5, it will satisfied or if Chi-Square/ df is less than 3, it will be ideal.

Furthermore, the present investigation necessitates the provision of an evaluation of discriminant validity, as outlined by Awang et al. (2018). To accomplish this, it is necessary to provide support for two inspected assumptions. To begin with, it is required to calculate the square root of the average variance extracted (AVE) for each construct in the PV-FSMA model, as denoted by bold font. The correlation coefficient has also been extracted. Hence, to prove discriminant validity in the latest

study, it is imperative that the square root of the Average Variance Extracted (AVEs), denoted in bold, exceeds the inner correlation coefficients of the other constructs. Upon observing the results shown in Table 6, it can be concluded that the PV-FSMA model confirms discriminant validity. This implies that there is no evidence of a redundant construct, as indicated by the absence of such a construct in Table 6. The study examined the composite reliability, convergent validity, and discriminant validity of the PV-FSMA model, providing guidance for conducting structural equation modeling (SEM) analyses.

Table 6
CR, AVE, and discriminant validity of PV-FSMA model

Constructs	1	2	3	4	5	6	7	8
FSMA-SQ	0.841							
FSMA-EU	0.065	0.833						
FSMA-US	0.272	0.078	0.819					
FSMA-AR	0.421	0.122	0.738	0.746				
FSMA-SE	0.424	0.029	0.767	0.665	0.797			
FSMA-SI	0.552	0.008	0.294	0.255	0.457	0.860		
FSMA-ITU	0.756	0.035	0.408	0.355	0.583	0.693	0.861	
PV-FSMA	0.551	0.029	0.616	0.616	0.764	0.500	0.631	0.771

5.3. SEM estimation

Following the conclusion of all necessary evaluations in the setting of Confirmatory Factor Analysis (CFA), the constructs of the PV-FSMA model were further submitted to Structural Equation Modeling (SEM) to calculate the findings of the hypotheses outlined in the present study. These results are clearly depicted in Figure 2 and Table 7. The Figure 2 model offers a measure of the R2 for endogenous constructs. The coefficient of determination (R²) for FSMA-ITU is 0.83, suggesting that the exogenous factors (FSMA-ES, FSMA-US, FSMA-AR, FSMA-SE, FSMA-SI, and FSMA-SQ) collectively account for approximately 83% of the variance in FSMA- ITU among residents in Jordan. In a similar vein, the coefficient of determination (R²) for the PV-FSMA is 0.45, suggesting that the exogenous construct (FSMA-ITU) accounts for approximately 83% of the PV- FSMA among citizens in Jordan.

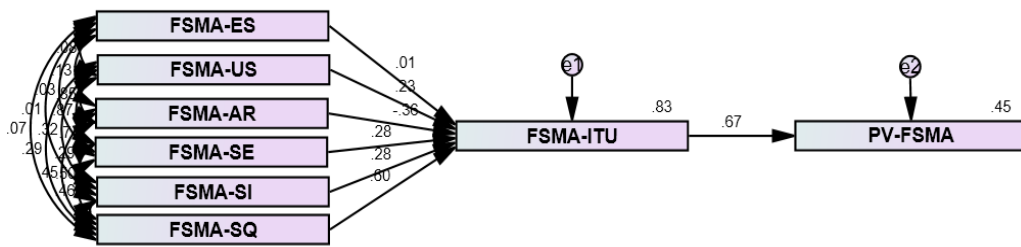


Fig. 2. The estimation hypotheses results of PV-FSMA model.

In addition, Table 6 provides the hypotheses results of the current research. The results confirmed that all hypotheses provided a significant effect except **H1**. The results uncover that FSMA-ES does not support a significant impact of FSMA-ITU among citizens’ Jordan ($\beta = 0.014, p = 0.501$), resulting in **H1** is not accepted. In addition, the findings uncover that FSMA-US has a positive and direct effect on FSMA-ITU among citizens’ Jordan ($\beta = 0.197, p = 0.000$), resulting in **H2** is accepted. Moreover, the findings disclose that FSMA-AR has a significant and direct effect on FSMA- ITU among citizens’ Jordan ($\beta = -0.434, p = 0.000$), resulting in **H3** is supported. As well as the results disclose that FSMA-SE has a significant and direct effect on FSMA- ITU among citizens’ Jordan ($\beta = 0.347, p = 0.000$), resulting in **H4** is affirmed. As well as the results assert that FSMA-SI has a significant and direct effect on FSMA- ITU among citizens’ Jordan ($\beta = 0.237, p = 0.000$), resulting in **H5** is empirically asserted. Furthermore, the findings disclose that FSMA-SQ has a positive and direct effect on FSMA- ITU among citizens’ Jordan ($\beta = 0.744, p = 0.000$), resulting in **H6** is supported by empirical evidence. Finally, the findings emphasize that FSMA- ITU has a positive and direct effect on PV-FSMA among citizens in Jordan ($\beta = 0.584, p = 0.000$), resulting in **H7** is emphasized by empirical evidence.

Table 7
The hypotheses findings of PV-FSMA model

H#	Hypothesis direction	Estimate	S.E.	C.R.	P
H1	FSMA-EU → FSMA- ITU	.014	.021	.672	.501
H2	FSMA-US → FSMA- ITU	.197	.046	4.241	***
H3	FSMA-AR → FSMA- ITU	-.434	.050	-8.745	***
H4	FSMA-SE → FSMA- ITU	.347	.057	6.137	***
H5	FSMA-SI → FSMA- ITU	.237	.022	10.990	***
H6	FSMA-SQ → ITU	.744	.034	21.787	***
H7	FSMA- ITU → PV-FSMA	.584	.029	20.026	***

6. Results Discussion

Recently, the government and Central Bank of Jordan have encouraged Jordanians to accomplish their financial transactions using fintech applications (Goldstein et al., 2019; Singh, 2020). However, it has been mentioned that the number of fintech services application users has increased and the number of fintech services applications has been maximized in Jordan (Al-Afeef et al., 2023). The major purpose of this article was to empirically estimate citizens' attitudes and behaviors toward using FSMA and build theoretical and empirical grounds to measure the PV-FSMA model among citizens of Jordan. For fulfilling these objectives, several factors were opted from several information systems theories (DOI, TPB, UTAUT, TAM, and IS). However, the research findings pledge to confirm the role of FSMA- ITU and its prior factors in generating the PV- FSMA in government institutions in Jordan.

The provided findings of the current results uncover that FSMA-ES does not confirm a positive impact on FSMA- ITU, which is not in line with the prior investigations in relevant literature such as Ngo & Nguyen (2022). The potential justification for this result is that citizens of Jordan make more effort to perform their transactions using the Efwaterkom mobile app. Another justification is that residents of Jordan compare the Efwaterkom mobile app with other fintech apps from different sectors, like telecommunication companies in Jordan. The obtained results also confirm that FSMA-US provides a direct effect on FSMA- ITU among citizens of Jordan, which is consistent with previous research (Ngo & Nguyen, 2022; Hasan et al., 2021). Moreover, the returned findings emphasize that FSMA-AR has a significant and direct influence on FSMA-ITU among citizens of Jordan, which is consistent with several studies in mobile fintech literature, such as Reddick & Zheng (2017). In addition, the retrieved results disclose that FSMA-SE supports a positive and direct impact on FSMA- ITU among citizens of Jordan, which is in line with past investigations in fintech services literature (Al-Afeef et al., 2023). The findings also assert that FSMA-SI provides a significant effect on FSMA- ITU among citizens of Jordan, matching mobile fintech studies in relevant literature (Al Nawayseh, 2020; Chan et al., 2022; Singh et al., 2020). Furthermore, the results show that FSMA-SQ has a considerable influence on FSMA- ITU among citizens of Jordan, which is in line with past studies in the literature (Ellison et al., 2016). Finally, the results confirm that FSMA- ITU has a positive and significant effect on generating public value for FSMA among citizens of Jordan, which matches previous papers in the literature (Agbabiaka, 2018).

In accordance with the findings of the current research, it has been confirmed that the most significant variables influencing the citizens' acts and attitudes toward using FSMA in Jordan are FSMA-SE, FSMA-SI, and FSMA-SQ. In addition, it has been observed that the most affecting factor in describing the citizens' behavior and FSMA-ITU in Jordan is the FSMA-SQ. This result could indicate that FSMA is enhanced when the developers and designers work on several advancements, such as making the app easier to use, more friendly, and having a high rate of transaction response (DeLone & McLean, 2003; Wang & Liao, 2008). The findings also uncover that government managers and leaders in Jordan could make more effort to develop processes of FSMA in line with citizens' requirements, such as maximizing their benefits, reducing the cost of services, and reducing service times (Ngo & Nguyen., 2022). As a result, the public value of government institutions employing FSMA could be generated among Jordanians.

7. Theoretical and Practical Implications

The findings of the present study have made a valuable contribution to the relevant literature through multiple avenues. This article represents the first study endeavoring to establish a connection between the financial services platform and the notion of public value in the Middle Eastern nations represented by Jordan. Examining the perceptions and experiences of Jordanian citizens regarding the utilization of FSMA in the public sector can provide valuable insights into the factors that influence its usage. This research has the potential to enhance the public value of these applications by offering novel perspectives and an understanding of the variables that affect their adoption and utilization.

The current paper presents a number of theoretical implications. It aims to assess the PV-FSMA model by examining the influence of multiple variables derived from information systems theories, namely DOI, TPB, UTAUT, TAM, and IS, on the utilization of FSMA among citizens in Jordan. Additionally, the study investigates the impact of these factors on the generation of public value within government institutions. Previous studies have been undertaken to explore users' knowledge in various circumstances, including the adoption of Fintech services, intention to use, and performance (Al-Afeef et al., 2023; Khuong et al., 2022; Ngo & Nguyen, 2022). However, there has been a recognition of the significance of developing a theoretical foundation based on public value theory inside the realm of financial services platforms, specifically in the context of fintech mobile applications. This observation has highlighted the potential theoretical implications that can arise from such an approach.

This research offers practical implications. This article has made significant contributions to the fields of FSMA and public value theory by examining the utilization of FSMA presented by government institutions dependent on residents' opinions of Jordan. The empirical evidence from various studies has consistently supported and validated previous research findings, suggesting that the intention to use of government services, along with its prior factors, plays a crucial role in determining the public value of government institutions services from the citizens' standpoint (Agbabiaka, 2018; DeLone & McLean, 2003; Scott et al., 2016). The outcomes of this study have disclosed that the FSMA- ITU and its antecedents are considered critical determinants in identifying the public value of FSMA in Jordan. The results found that SMA-SE and FSMA-SQ are the most influential dimensions that have the ability to identify the degree of FSMA- ITU and generate the PV-FSMA in Jordan. The

major feature of the current article is that it has validated empirical support to evaluate the effect of various factors adopted from multiple theories on the PV of FSMA in the government sector context, depending on residents' views. The returned outcomes of this study could be proposed as a valuable reference for public institutions managers, practitioners, policymakers, scholars, developers, and designers in the setting of FSMA in Jordan. In addition, providing sufficient information and knowledge regarding the factors that influence the PV-FSMA is a desired approach to facilitate the development and long-term existence of mobile apps in the realm of fintech. Lastly, creating or increasing the public value using FSMA requires several serious procedures, such as top management support of public institutions, updating the FSMA continuously, meeting the citizens' requirements from FSMA, and adopting a modernized technology in FSMA like blockchain technology, cloud computing platform, and artificial intelligence (Renduchintala et al., 2020) .

8. Recommendations and Future Trends

This research identifies several difficulties and potential future trends. Several restrictions have been encountered while pursuing the objectives of the present study. Firstly, it has been noted that the utilization of convenience methods in doing research may not necessarily yield data that may be generalized or deemed accurate. Therefore, employing alternative methodologies for establishing the sample size may yield more accurate outcomes. In addition, increasing the sample size may lead to providing a more comprehensive comprehension of citizens' public value inside the realm of the FSMA context. Like a prior study, it is difficult to integrate all factors influencing the PV-FSMA model of the current research. Future work could add several variables that may influence the usage of FSMA and generate value for public and government institutions. The potential added variables are eWOM (Aljaafreh et al., 2022), performance expectancy (Alalwan et al., 2017), perceived trust (Hasan et al., 2021), users' knowledge (Ngo & Nguyen, 2022), and effort expectancy (Chan et al., 2022), which have been identified as influential factors in FSMA platform and suggested to comprehensively assess PV-FSMA in government sector. Moreover, the mediation role of FSMA- ITU does not estimate. It is suggested that examining the mediation role of FSMA- ITU could present an alternative approach to increase the PV-FSMA. Additionally, the future trends could focus on studying the moderation role of demographic variables that may contribute to the field of the current article. Furthermore, the adoption of blockchain technology regarding the fintech services in Jordan expects to supply distinct novelty (Renduchintala et al., 2020). It is recommended that performing theoretical and qualitative investigations regarding future digital transformation technologies (such as blockchain technology, artificial intelligence, and cloud computing) in FSMA is expected to maximize the rate of FSMA usage and look at the PV- FSMA from different perspectives. Ultimately, classifying the financial services of public institutions depending on realistic standards suggests producing a several type of financial services and FSMA to Jordanians (Alabdallat, 2020). Future trends may focus on conducting investigations to classify the financial services depending on the priority of use.

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