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An empirical investigation on acceptance of mobile payment system services in Jordan: extending UTAUT2 model with security and privacy

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Abstract: Several developed and developing countries have launched a mobile payment system service, which is known in Jordan as Jordan Mobile Payment (JoMoPay) system to overcome the drawbacks of traditional payment system. The system supports payment transactions by utilising mobile phones applications. However, the acceptance of JoMoPay system in Jordan is still below the level of expectation. This study was undertaken to understand and explain the acceptance of JoMoPay system based on extending the unified theory of acceptance and use of technology (UTAUT2) model in the Jordanian context. The model was extended by considering two additional constructs namely; security and privacy. Utilising a self-reported survey, collected data was analysed using structural equation modelling (SEM) to test the research model. Five constructs were found to be the determinants of behavioural intention to use JoMoPay system, namely performance expectancy, social

influence, price value, security and privacy. Together they account for 61.4% of the variance in behavioural intention. However, effort expectancy, facilitating condition and hedonic motivation did not have a significant impact on behavioural intention to use JoMoPay system and hence the related hypotheses were not supported. Lastly, conclusions, limitations and future research directions will be discussed further in the last section of the paper.

Keywords: JoMoPay system; M-payment; UTAUT model; Central Bank of Jordan; CBJ; security and privacy; Jordan.

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1 Introduction

The Central Bank of Jordan (CBJ) has launched the JoMoPay system on March 2014 to help develop and establish a national payment system to include a wider portion of the population who do not have a bank account (CBJ, 2014). As a result, those people who did not have bank accounts can use JoMoPay system by opening e-wallet accounts using smart mobile phones [CBJ, 2017a; Groupe Speciale Mobile Association (GSMA), 2016]. Hence, this system has established a new electronic payment window utilising mobile phones in settling payments (Sehwail and Bahou, 2017). This window helped attain efficiency and security, provided the proper financial environment by reducing the reliance on paper money in settling payments, and reduced the transactional costs for a wider segment of people (Bahou, 2014).

The advancements in Information and Communication Technology (ICT) form a vital factor in socio-economic development, which contribute to enhancing the growth of both developed countries and also in emerging economies (Alam et al., 2020; Al-Fraihat et al., 2020; Malaquias and Hwang, 2019; Solvak et al., 2019; Bankole and Bankole, 2017). One good example of these advancements would be the development of a mobile payment system (CBJ, 2017b). As cited in recent international studies, the use of electronic cards, whether debit or credit cards, added about US \$18 billion annually to gross domestic product (GDP) of the Arab region (Ghazal, 2014). This addition to GDP is consistent with what Saleh and Bahou (2015) claim in the case of the electronic payment systems automation in Jordan, which will contribute to the increase of the GDP of the nation. Hence, the transformation from the traditional payment system to an electronic one will lead to an increase in transparency and integrity as well as the growth of the GDP (Al Hanandeh and Bahou, 2016).

In recent years, the Jordanian communications sector has experienced considerable growth in activities, especially in the context of the internet and smartphones penetration. The penetration of internet subscriptions in Jordan reached 87%. Statistics also show that

the increase in smartphone subscription penetration has reached 168% [Ghazal, 2017a, 2017b; Ministry of Information and Communications Technology (MOICT), 2017a, 2017b; Telecommunications Regulatory Commission (TRC), 2016]. As part of the continuous evolution of the Jordanian ICT sector, The MOICT has launched a project called 'Internet for All', which is aligned with Jordan's Digital Transformation Strategy (JDTS) and facilitating the development of e-government services, and improving the performance of the public sector in Jordan (Ghazal, 2017a, MOICT, 2017a). To support the financial inclusion in Jordan, the project aims to provide formal financial services for the excluded and deprived groups (CBJ, 2015). Now people who live in rural areas and do not have bank accounts can make payments by opening e-wallets account using mobile phones (CBJ, 2017a; Al Hanandeh and Bahou, 2016).

Financial inclusion, including electronic payment systems, means offering quality and diversified financial services at a reasonable cost (CBJ, 2017a). As a result, all previously mentioned benefits support the GDP growth (CBJ, 2014, 2016, 2017a). In addition, the electronic payment systems also encourage savings and investments, enhance living standards, create job opportunities, reduce the paper money printing cost, reduce risks of money transportation cost, and reduce the risk of human errors (Al-Okaily et al., 2019; Al Hanandeh and Bahou, 2016; Saleh and Bahou, 2015). In theory, the electronic payment systems tend to smooth operations, and mitigate the systemic credit risks, and it also facilitates the circulation of money in order to enhance economic efficiency (CBJ, 2014). Eventually, developing an advanced electronic payment system is crucial in maintaining the strength and efficiency of the national payment system based on the advantages mentioned above to attain sustainable comprehensive development and contributes to supporting the Jordanian GDP growth.

This paper covers six sections as follows: It starts with an introduction related to mobile payment systems. Section 2 reviews the literature on UTAUT model, UTAUT2 model and then presents the research hypotheses. Section 3 introduces the research methodology and Section 4 provides research results and discussion. Section 5 provides conclusion and implications. Finally, Section 6 provides research limitations and future directions.

2 Literature review and hypotheses

UTAUT2 model originally proposed by Venkatesh et al. (2012) was applied as a conceptual model in this paper to explore the JoMoPay system acceptance from employees' perspective in Jordanian public sector. The UTAUT2 extended the UTAUT model, which integrated constructs from eight major theories and models of technology acceptance (Venkatesh et al., 2003). Theories included in the integration process of the UTAUT were; theory of reasoned action (TRA), theory of planned behaviour (TPB), social cognitive theory (SCT), technology acceptance model (TAM), innovation diffusion theory (IDT), model of PC utilisation (MPCU), motivational model (MM), combined TAM and TPB (C-TAM-TPB). Table 1 depicts all of models and theories integrated into the UTAUT model.

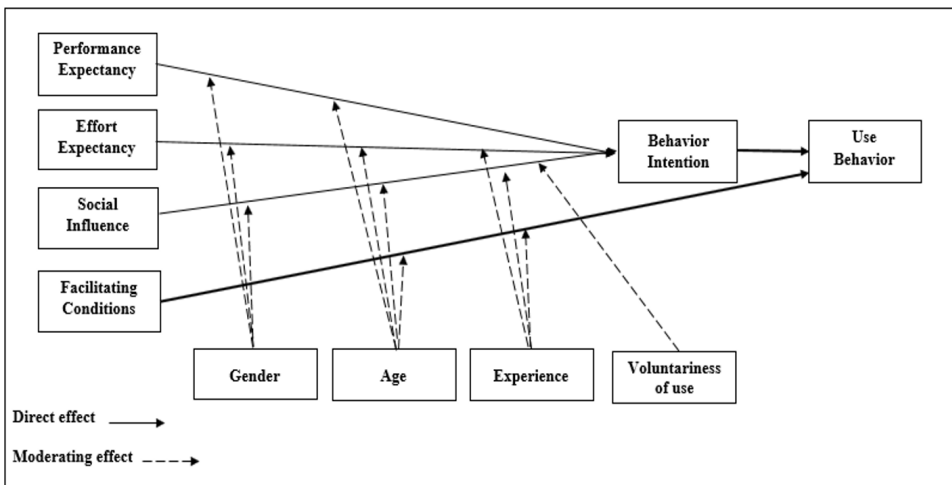
The UTAUT model has four main factors which influence behavioural intention to use a technology and use behaviours namely performance expectancy, effort expectancy, social influence, and facilitating conditions. The relationships between these factors, behaviour intention and behaviour of use are moderated by four key factors including

gender, age, experience, and voluntariness of use (Venkatesh et al., 2003). Figure 1 depicts the components of the UTAUT model.

Table 1 The integration of eight theories and models to access UTAUT

No.	Name of theory/model	Abb.	Founders
Models and theories which reflect UTUAUT model:			
1	Theory of reasoned action	TRA	Fishbein and Ajzen (1975)
2	Theory of planned behaviour	TPB	Ajzen (1985, 1991)
3	Social cognitive theory	SCT	Bandura (1986)
4	Technology acceptance model	TAM	Davis (1989)
5	Innovation diffusion theory	IDT	Moore and Benbasat (1991)
6	Model of PC utilisation	MPCU	Thompson et al. (1991)
7	Motivational model	MM	Davis et al. (1992)
8	Combined TAM and TPB	C-TAM-TPB	Taylor and Todd (1995)

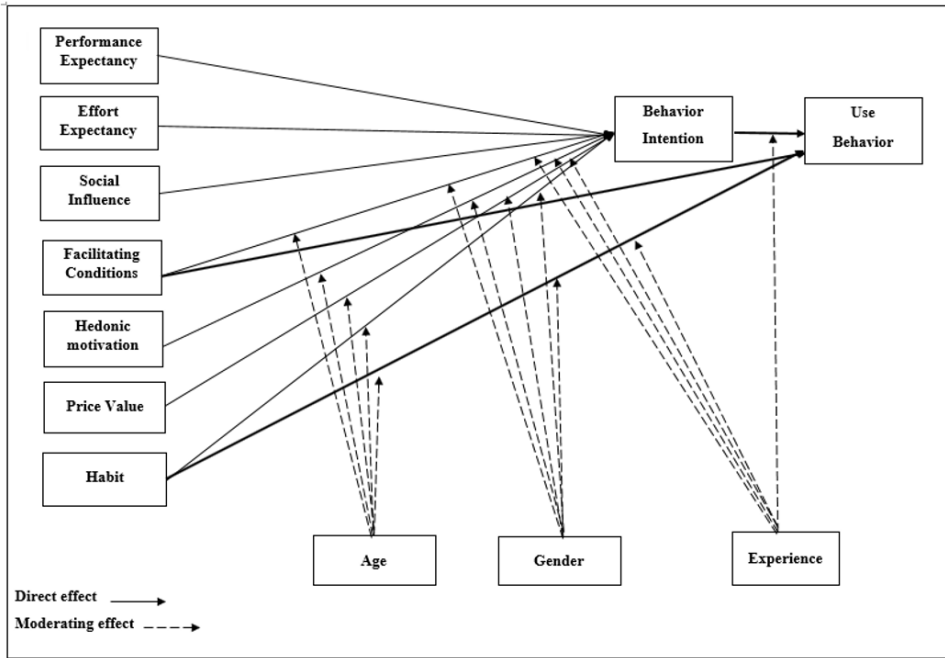
Figure 1 UTAUT



Source: Venkatesh et al. (2003)

Later, Venkatesh et al. (2012) extended the UTAUT model based on their findings from a research conducted in Hong Kong. They presented three new factors to the original UTAUT model. The first factor is hedonic motivation, the second factor is price value, and the third factor is habit, forming the new UTAUT2 model. Moreover, Venkatesh et al. (2012) claimed that the suggested additions in UTAUT2 model exhibited significant changes in the variance explained in behavioural intention and technology use. In total, the new UTAUT2 model posits seven factors as the determinants of behavioural intention and use of technology. The factors include performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit. They are moderated by gender, age, and experience as shown in Figure 2. Venkatesh et al. (2012) recommended more development and validation of the model, and suggested different contexts such as new culture, and new technology as in the case in this paper.

Figure 2 UTAUT2



Source: Venkatesh et al. (2012)

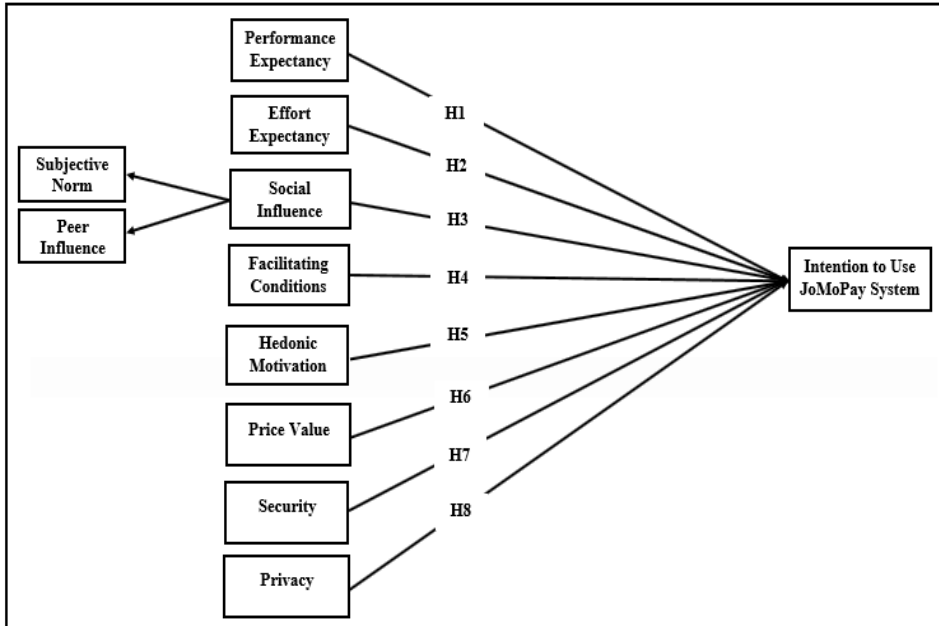
Building on the previous literature supporting the robustness of both the UTAUT and UTAUT2, this study extended the UTAUT2 with two factors that are assumed to predict the intention of public sector employees to use JoMoPay system. As shown in Figure 3, the key factors adopted from UTAUT2 are namely; performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation and price value which were proposed as immediate predictors of intention of public sector employees to use JoMoPay system. Security and privacy were integrated into UTAUT2 model as external factors in the same theoretical model, which is endorsed by Venkatesh et al. (2012) to widen the theoretical prospect of UTAUT2 model.

In this paper, the conceptual model will not include the role of habit. This is due to the fact that JoMoPay system is a new payment channel in Jordan, it is the rate of adoption which remains slow and restricted by a number of limitations (Alalwan et al., 2016, 2017; Qasim and Abu-Shanab, 2016). This was based on the premise that in order to consider the role of habit, users should be used to such a system. However, to study technology adoption, the unit of analysis should be its potential users. Therefore, we propose to examine the conceptual research model on Jordanian ministries' employees who have not yet tried to use such a system.

Moreover, it should be also noted that this paper did not consider the role of user behaviour and the moderating effect of gender, age, experience and voluntariness of use in the conceptual model. Since the JoMoPay system is a new payment method in Jordan, it has a very low adoption rate (Al-Okaily et al., 2019; Alalwan et al., 2017; Qasim and Abu-Shanab, 2016; Jaradat and Al-Mashaqba, 2014; Jaradat and Faqih, 2014). Thus, the current paper will focus on investigating intention to use JoMoPay system for non-users

Lastly, with regard to the moderating effect of gender, age, experience, and voluntariness of use, there are many studies that have excluded use behaviour and moderating role in their studies (e.g., Alalwan et al., 2017; El-Masri and Tarhini, 2017; Qasim and Abu-Shanab, 2016; Afshan and Sharif, 2016; Morosan and DeFranco, 2016; De-Sena Abrahão et al., 2016; Slade et al., 2015; Alshare and Mousa, 2014; Raman and Don; 2013).

Figure 3 Conceptual model



With regard to security and privacy, various previous studies confirmed the significance of carrying out additional research on the effect of security and privacy on intentions to use the mobile payment systems. Accordingly, several past studies in the area of the mobile payment systems and UTAUT model recommended to study the security and privacy in future research (e.g., Gupta et al., 2018; Schwail and Bahou, 2017; Al Shawwa, 2016; Alalwan et al., 2016; Oliveira et al., 2016; Morosan and DeFranco, 2016; Qatawneh et al., 2015; Al Shawwa, 2015; Jaradat and Al-Mashaqba, 2014). However, the present study recognised the need of studying security and privacy by linking it with intention to use JoMoPay system.

Lastly, only a few comprehensive models (e.g., TAM, TPB and UTAUT model) were found to examine the acceptance of mobile payment systems in developing countries, while most models significantly were tested in developed countries. Accordingly, this study adapted and expanded the UTAUT2 model by the incorporation four new additional factors namely subjective norm, peer influence, security and privacy, which are considered as important variables which have an effect on the acceptance of mobile payment systems in the Jordanian context and the Middle East. In this view, the review of literature does not indicate that those factors mentioned above were integrated with the UTAUT2 model together by prior literature related to mobile payment systems in the

context of Jordan and the Middle East. Therefore, extending the UTAUT2 model as an underpinning model including four new factors (as external critical factors) is thought to be a very useful to understand the users' intentions towards acceptance of JoMoPay in Jordanian environment, while as that UTAUT2 model has not been completely uncovered and understood in the Jordanian context.

As presented in Figure 3, this study adopted the following constructs from UTAUT2 namely: performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation and price value, and included security and privacy as direct determinants of the intention to use JoMoPay system. The following subsections discuss the hypotheses development and their related literature.

2.1 Performance expectancy

According to the UTAUT model, performance expectancy is defined as “the degree to which an individual believes that using the system will help him or her to attain gains in job performance” [Venkatesh et al., (2003), p.447]. Performance expectancy is a strong predictor of behavioural intention in both voluntary and mandatory settings in information technology context (Ling et al., 2020; Venkatesh et al., 2003). However, Venkatesh et al. (2003) derived performance expectancy from five constructs from prior information technology acceptance models:

- 1 perceived usefulness in TAM and C-TAM-TPB
- 2 relative advantage in IDT
- 3 extrinsic motivation in MM
- 4 job fit in MPCU
- 5 outcomes expectations in SCT.

Performance expectancy is measured using four questions adapted from Venkatesh et al. (2012). Several previous studies in the area of mobile payment system acceptance have found performance expectancy as helpful and significant in explaining the intention to use mobile payment system. Due to the expected increase in job performance, users are expected to have a stronger tendency to adopt such technology, where past studies have also supported the role of performance expectancy is related to various contexts such as mobile payment system (Alalwan, 2020; Gharaibeh and Arshad, 2018; Rita et al., 2018; Gupta et al., 2018; Acheampong et al., 2018; Alalwan et al., 2017; Mugambe, 2017; Bankole and Bankole, 2017; Qasim and Abu-Shanab, 2016; Wong et al., 2016; Oliveira et al. 2016; Morosan and DeFranco, 2016; De-Sena Abrahão et al., 2016; Baptista and Oliveira, 2015; Slade et al., 2015; Alshare and Mousa; 2014; Thakur, 2013; Abu-Shamaa et al., 2016). In this cross-sectional study and in accordance with the UTAUT2 studies, it is expected that if the users think that the JoMoPay system is useful and will add value to their user's experience then they are more expected to adopt the system. Thus, this leads to the following hypothesis:

- H1 Intention to use JoMoPay system will be positively influenced by performance expectancy.

2.2 *Effort expectancy*

Effort Expectancy is defined as “the degree of ease associated with the use of the system” [Venkatesh et al., (2003), p.450]. However, effort expectancy has a significant influence on the behavioural intention of a user to use information technology (Venkatesh et al., 2003). Venkatesh et al. (2003) derived effort expectancy from three constructs from prior information technology acceptance models:

- 1 perceived ease of use in TAM
- 2 complexity in MPCU
- 3 complexity in IDT.

Effort expectancy is measured using four questions adapted from Venkatesh et al. (2012). In addition, effort expectancy means that users will be having some level of knowledge and skill which will further enable the users to use mobile payment systems and this will further lead towards putting some effort to gain more knowledge (Alalwan et al., 2016, 2017). Many previous studies in the area of mobile payment system acceptance have found effort expectancy as significant predictor of intention to use mobile payment system (Islam et al., 2019; Gharaibeh and Arshad, 2018; Rita et al., 2018; Acheampong et al., 2018; Alalwan et al., 2017; Mugambe, 2017; Bankole and Bankole, 2017; Wong et al., 2016; Oliveira et al., 2016; De-Sena Abrahão et al., 2016; Oliveira et al., 2014; Thakur, 2013; Abu-Shamaa et al., 2016). Hence, this leads to the following hypothesis:

H2 Intention to use JoMoPay system will be positively influenced by effort expectancy.

2.3 *Social influence*

Social Influence is defined as “the degree to which an individual perceives the importance of others to believe that he or she should use the new system” [Venkatesh et al., (2003), p.451]. In a related context, social factors construct is a good predictor of use of information technology (Venkatesh et al., 2003). Venkatesh et al. (2003) derived social influence from three constructs from prior information technology acceptance models:

- 1 subjective norms in TRA, TPB and C-TAM-TPB
- 2 social factors in MPCU
- 3 image in IDT.

Social influence in this study was conceptualised as a global variable derived from two dimensions. The first dimension is the subjective norm which was measured using four items that were adapted from Ajzen (1991), Venkatesh et al. (2012) and Faqih (2016). The second dimension is peer influence which was measured using four items adapted from Taylor and Todd (1995), Hsieh et al. (2008) and Brown et al. (2010). A number of previous studies in the area of mobile payment system acceptance and information system have found social influence a major predictor of the intention to use continuance usage of mobile payment system (Islam et al., 2019; Gharaibeh and Arshad, 2018; Gupta et al., 2018; Acheampong et al., 2018; Mugambe, 2017; Bankole and Bankole, 2017; Qasim and Abu-Shanab, 2016; Morosan and DeFranco, 2016; De-Sena Abrahão et al.,

2016; Slade et al., 2015; Alshare and Mousa, 2014; Oliveira et al., 2014). Thus, this leads to the following hypothesis:

H3 Intention to use JoMoPay system will be positively influenced by social influence.

2.4 Facilitating conditions

Facilitating Conditions is defined as “the degree to which an individual believes that an organisational and technical infrastructure exists and will help him/her to use of the system” [Venkatesh et al., (2003), p.453]. Facilitating conditions construct is a significant predictor of the use of information technology (Venkatesh et al., 2003). Venkatesh et al. (2003) derived facilitating conditions from three constructs from prior information technology acceptance models:

- 1 perceived behavioural control in TPB and C-TAM-TPB
- 2 facilitating conditions in MPCU
- 3 compatibility in IDT.

Facilitating conditions is measured using four questions adapted from Venkatesh et al. (2012). Previous studies in the field have found facilitating conditions a significant predictor of the intention to use mobile payment system. In addition, they will have a stronger tendency to adopt mobile payment system (Islam et al., 2019; Gharaibeh and Arshad, 2018; Rita et al., 2018; Acheampong et al., 2018; Alalwan et al., 2017; Mugambe, 2017; Afshan and Sharif, 2016; Morosan and DeFranco, 2016; Oliveira et al., 2014; Thakur, 2013). Accordingly, this leads to the following hypothesis:

H4 Intention to use JoMoPay system will be positively influenced by facilitating conditions.

2.5 Hedonic motivation

According to UTAUT2 model, hedonic motivation is defined as the fun or pleasure derived from using a technology (Venkatesh et al., 2012). Hedonic motivation is similar to perceived enjoyment in prior research (Alalwan et al., 2018). Theoretically, hedonic motivation was found to be a significant factor predicting the intention to adopt mobile payment systems (Alalwan, 2020; Alalwan et al., 2016, 2017, 2018; Gharaibeh and Arshad, 2018; Makanyeza and Mutambayashata, 2018; Sivathanu, 2018; Gupta al., 2018; Mugambe, 2017; El-Masri and Tarhini, 2017; Morosan and DeFranco, 2016; Baptista and Oliveira, 2015). In this study, it is expected that employees who perceive using a JoMoPay system as being fun are intrinsically interested in their payment systems, they are more probable to use the system. Thus, this leads to the following hypothesis:

H5 Intention to use JoMoPay system will be positively influenced by hedonic motivation.

2.6 Price value

Price value is defined as the individuals’ cognitive trade-off between the perceived benefits of the applications and the monetary cost for using them (Venkatesh et al.,

2012). Price value is measured using four questions adapted from Venkatesh et al. (2012). In this context, several previous studies in the area of mobile payment system acceptance have found price value to be significant predictor of intention to use mobile payment system. In addition, they will have a stronger tendency to adopt mobile payment system (Alalwan, 2020; Gupta et al., 2018; Singh and Srivastava, 2018; Alalwan et al., 2017; Mugambe, 2017; Oliveira et al., 2016). Therefore, this leads to the following hypothesis:

H6 Intention to use JoMoPay system will be positively influenced by price value.

2.7 Security

Security refers to the perceived safety of financial information, such as credit card details entered into certain websites, where users assume that websites are deemed to be secured and trustworthy (Macht, 2014). Several previous studies in the area of mobile payment system acceptance have found security has significant and positive influence on behavioural intention to use mobile payment system services (Singh and Srivastava, 2018; Liébana-Cabanillas et al., 2018; Al-Okaily & Rahman, 2017; Hankun et al., 2016; Ramos-de-Luna et al., 2016; Morosan and DeFranco 2016; Oliveira et al., 2016; Qatawneh et al., 2015; Di Pietro et al., 2015; Alshare and Mousa, 2014; Escobar-Rodríguez and Carvajal-Trujillo, 2014). Therefore, this leads to the following hypothesis:

H7 Intention to use JoMoPay system will be positively influenced by security.

2.8 Privacy

Privacy preservation plays a major role in providing security (Jawahar and Sabari, 2020). However, privacy is defined as the degree to which the customer thinks that his personal information stored on the mobile payment system is protected (Javadi, 2011; Parasuraman et al., 2005). Many previous studies in the area of mobile payment system acceptance have found significant positive relationship between privacy and intention to use mobile payment system (Al-Hawary and Al-Smeran, 2017; Bankole and Bankole, 2017; Faqih, 2016; Morosan and DeFranco, 2016; Qatawneh et al., 2015; Escobar-Rodríguez and Carvajal-Trujillo, 2014). On the other hand, few studies found negative relationship between privacy and intention to use mobile payment system (Jun et al., 2018; Chopdar et al., 2018). However, other past studies reported insignificant relationship (Jun et al., 2018; Chopdar et al., 2018; Faqih, 2016; Morosan and DeFranco; 2016). This inconsistency in results in different contexts gives motivation for researchers to conduct more studies considering privacy in another context such as Jordan. Consequently, this leads to the following hypothesis:

H8 Intention to use JoMoPay system will be positively influenced by privacy.

In summary, the previous sections discussed the direct relationships between performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, security and privacy as the independent variable and behavioural intention to use JoMoPay system as the dependent variable. Accordingly, there are eight hypotheses formulated to test the various relationships in the proposed

research model to predict the intention of public sector employees to use JoMoPay system.

3 Research methodology

There are two research approaches are used in scientific research, namely, quantitative and qualitative research. To achieve the purpose of this study, the study adopted the quantitative research approach to investigate the relationship between several independent variables and the acceptance of JoMoPay system by employees of the public sector as the dependent variable while the independent variables are performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, security and privacy. As a quantitative research type, the results were presented as numbers, statistics, and figures because the sample of the research was quite large and the respondents were staying in different parts of Jordan. The researcher used questionnaires to examine the acceptance of JoMoPay system among public sector employees in Jordan.

In this regard, there are several justifications for adopting the quantitative approach and the primary goal of this study was to establish a causal relationship between the variables of interest (Sekaran and Bougie, 2010). Meanwhile, the quantitative approach allows a researcher to summarise and to present results in the numerical statistical form with a high level of confidence (Zikmund, 2003). In another perspective, Leedy and Ormrod (2005) stated that the best method to learn about the relationship among measurable variables with the intention of explaining, predicting and managing phenomenon is a quantitative research method. Moreover, quantitative approach is very useful to analyse and prove theories, discover important variables for future research and relate variables posed by questions or hypothesis, using standards of validity and reliability and statistical procedures (Creswell, 2013). On this basis, the researchers has sufficient justification to adopt the quantitative approach in this study.

The focus of this study is on employees who are working in public sector organisations in Jordan. The total number of public sector employees in Jordan in 2017 is approximately 222,672. In this regard, it would be ideal to conduct the study on the entire population of public sector employees in Jordan. However, since the population is very large, it is impossible to include every member of the population. A sampling is a process of selecting a sufficient number of elements from the population (Sekaran and Bougie, 2010). Therefore, the researchers followed Krejcie and Morgan (1970) method of taken the sample size, because it is more popular and the most widely used by researchers.

With regard to sampling technique, there are many challenges due to time, money and access prevent a researcher to collect data from the entire population of the study. Sampling thus gives higher accuracy and faster results. According to Sekaran (2003), there are two major types of sampling design, namely; probability sampling and non-probability sampling. In probability sampling, the elements in the population have some known, non-zero chance or probability of being selected as sample subjects (Sekaran and Bougie, 2016). In contrast, non-probability sampling which is the probability of choosing each element from a population as a sample subject is unknown (Sekaran and Bougie, 2016). Additionally, when the generalisability does not matter, the non-probability technique is generally used (Samuel et al., 2003).

In this study, due to some limitations in selecting probability sampling such random sampling of the public employees, for example, with inability to obtain the listing of all public sector employees' names and addresses, the employees scattered all around the country, a high cost to conduct the study at every ministry, and a hard time to access to certain groups or classes of employees. While the purposive sampling technique is considered readily, fast, and easy where public employees can be selected because of their convenient accessibility and proximity to the researcher (Sekaran, 2003). Thus, since most main ministries are located in Amman and due to the cost and time considerations, the researchers has applied a non-probability sampling with the purposive sampling technique.

Moreover, the researchers administrated the survey by themselves to obtain a high response rate. The questionnaires were made available on a paper form and they were sent and received by hand. Then, the researcher visited each ministry in public sectors and distributed the questionnaires to employees and asked the employees to fill in the questionnaire, after receiving permission to collect the data from the minister office or general secretary office or the director of the human resources management of each ministry. After completing data collection from the ministries, the researchers visited again each ministry to receive a confirmation letter ensuring that the researchers had completed data collection at the ministries.

The Arabic language is the native language of Jordanians. The original measurements were adapted from several previous studies, which were in the English language. However, the use of the Arabic language in the questionnaire of current study provides ease in understanding for respondents as an advantage in communication. This also enables the researchers to get more insightful information by using the native language of the target population in the data collection process (Abu-Shanab and Md Nor, 2013). However, little literature published in Arabic language that investigates similar context, where survey items are available for the set of variables employed in this study. Therefore, extensive validation and translation procedures have been conducted before the data collection procedures.

In the translation process, since English is not the official language in Jordan, as well as to avoid the impact of cultural and language differences, the researchers followed the back-translation method (forward-backward-translations) suggested by Brislin (1986) which is considered as one of the most popular approaches for questionnaire translation (Forsyth et al., 2007). The services of a professional translation centre were acquired to translate the English version into standard Arabic language. Later, the Arabic version was retranslated into English by another academic team at the same centre to ensure consistency and avoid mistakes in translation; the original version of the English questionnaire and the translated version were compared. This process is called the back-translation method.

In this regard, the researchers engaged with the teams mentioned above in the translation process to ensure that the translation of the questionnaire from English to Arabic is accurate and free from biases. Such efforts were necessary to ensure the validity of content and wording of the questions as well as to ensure that all respondents will understand the questions and to avoid ambiguity. Hence, the result of this process produced the translated version of the questionnaire that equally performed in the same way as the original one. While the main focus of this process was on conceptual and cross-cultural equivalence rather than on literal/linguistic equivalence (Brislin, 1986; Forsyth et al., 2007; Zavala-Rojas, 2014).

To sum up, the data were gathered from employees who are working in public sector organisations in Jordan as chosen to participate in this study. Four hundred and four questionnaires were distributed via a drop-off-survey, where 318 questionnaires were returned, representing 79% participation. However, only 270 were usable for analysis, hence the effective response rate was approximately 67%. All the necessary statistical tests and data screening procedures were conducted by SPSS software Version 25 to ensure that the collected data readiness for further analysis. Data analysis and hypothesis testing were performed using the software package SmartPLS Version 3.2.3.

4 Research results and discussion

Partial least squares-structural equation modelling (PLS-SEM) has taken up a prominent role within the academic literature of many fields in accounting and management sciences, specifically in AIS and IS research. In line with that, the software package SmartPLS, Version 3.2.3 was used to perform data analysis and estimate the proposed model, as a structural equation modelling technique, PLS can simultaneously test the measurement (outer) model and the structural (inner) model and interpreted in two stages as follows (Ali et al., 2015; Hair et al., 2014; Ringle et al., 2012; Valerie, 2012; Gefen et al., 2011). The first stage, the measurement model (outer model) is tested to ensure its validity and reliability. Measurement properties of multi-item constructs, including convergent validity, discriminant validity, and reliability, are examined by conducting confirmatory factor analysis (CFA). The second stage, the structural model (inner model) is analysed by assessing R square, effect size, the predictive relevance of the model, the goodness of fit (GoF) of the model, and path coefficients through bootstrapping to test the study hypotheses (Hair et al., 2014; Valerie, 2012).

4.1 PLS-SEM measurement (outer) model

Measurement model evaluation is the first and the prerequisite step for generating results in PLS. It tests the measurements' reliability and validity. The assessment of the measurement model in PLS-SEM varies depending on the nature of measurement model itself, whether the model includes formative measures or reflective measures (Davcik, 2014; Hair et al., 2011, 2013, 2014). Therefore, before a proposed model can be used in hypothesis testing, the reliability and validity of its measurement model must first be checked (Ali et al., 2015).

4.1.1 Convergent validity

Convergent validity is defined as "the extent to which a measure correlates positively with alternative measures of the same construct" [Hair et al., (2014), p.102]. With regard to convergent validity evaluation, indicator reliability is evaluated using indicator loadings (recommended to be above 0.70), internal consistency reliability is evaluated using the Cronbach's alpha and composite reliability (CR) (recommended values for both of them should be 0.70 and above), and convergent validity using average variance extracted (AVE) (recommended value is 0.50 and above) (Hair et al., 2010, 2013; Sekaran and Bougie, 2010). On the other hand, as a rule of thumb, the variance influence factor (VIF) value of 5 and higher indicates a potential problem of multicollinearity (Hair

et al., 2011, 2014). Therefore, it should be less than 5 in order to ensure the absence of multicollinearity. As shown in Table 2, all the results were acceptable and within the recommended range. Therefore, it can be concluded that all constructs are suitable for further analysis.

Table 2 Convergent validity-item loading, Cronbach’s alpha, composite reliability, AVE and VIF

<i>Construct name</i>	<i>Item name</i>	<i>Item loading</i>	<i>Cronbach’s alpha</i>	<i>CR</i>	<i>AVE</i>	<i>VIF</i>
Performance expectancy	PE1	0.954	0.942	0.962	0.895	1.943
	PE3	0.945				
	PE4	0.940				
Effort expectancy	EE2	0.926	0.921	0.944	0.849	1.016
	EE3	0.918				
	EE4	0.920				
Facilitating conditions	FC1	0.834	0.861	0.906	0.706	1.923
	FC2	0.864				
	FC3	0.880				
	FC4	0.780				
Hedonic motivation	MO1	0.953	0.891	0.927	0.763	3.535
	MO2	0.877				
	MO3	0.958				
Price value	PV1	0.936	0.941	0.958	0.850	1.623
	PV2	0.948				
	PV3	0.919				
	PV4	0.883				
Security	SE1	0.980	0.984	0.989	0.969	1.799
	SE3	0.979				
	SE5	0.994				
Privacy	PR1	0.878	0.944	0.955	0.781	3.396
	PR2	0.906				
	PR3	0.916				
	PR4	0.892				
	PR5	0.884				
	PR6	0.823				
Intention to use JoMoPay system	BI1	0.927	0.957	0.969	0.885	D.V
	BI2	0.957				
	BI3	0.942				
	BI4	0.936				

Table 2 Convergent validity-item loading, Cronbach's alpha, composite reliability, AVE and VIF (continued)

<i>Construct name</i>		<i>Item name</i>	<i>Item loading</i>	<i>Cronbach's alpha</i>	<i>CR</i>	<i>AVE</i>	<i>VIF</i>		
Social influence	Subjective norm	SN1	0.903	0.886	0.923	0.751	1.952		
		SN2	0.937						
		SN3	0.882						
		SN4	0.729						
	Peer influence	PI1	0.922	0.940				0.957	0.849
		PI2	0.937						
		PI3	0.949						
		PI4	0.875						

4.1.2 Discriminant validity

Discriminant validity is defined as “the extent to which a construct is truly distinct from other constructs by empirical standards” [Hair et al., (2014), p.104]. Hair et al. (2011) stated that discriminant validity stipulates that each latent constructs' AVE should be higher than the construct's highest squared correlation with another latent construct (Fornell and Larcker, 1981). Thus, discriminant validity indicates the extent to which the construct is different from another. Moreover, there are three methods available to determine the discriminant validity namely; Heterotrait-Monotrait ratio of correlations (HTMT) method (Henseler et al., 2015), Fornell-Larcker method, and cross-loadings method (Hair et al., 2011, 2014; Fornell and Larcker, 1981). However, HTMT criterion has high sensitivity and specificity in detecting discriminant validity problems and more empirical evidence is needed to use this approach (Ab Hamid et al., 2017).

One of the methods that can be used to test discriminant validity in partial least squares structural equation modelling is HTMT of correlations since this method is the most recent one as suggested by Henseler et al. (2015). HTMT values close to 1 indicates a lack of discriminant validity. Using the HTMT as a criterion involves comparing it to a predefined threshold. If the value of the HTMT is higher than this threshold, one can conclude that there is an issue of discriminant validity (Ab Hamid et al., 2017). Some authors have suggested that threshold of 0.85 is to be considered (Henseler et al., 2015). Accordingly, Table 3 shows the results of HTMT criterion which meets the minimum value of HTMT and within the recommended range (Ab Hamid et al., 2017; Henseler et al., 2015).

In short, the analyses and results discussed in this section provide a solid piece of evidence that supports all reflective measurements and soundness of the measurement in the path model. In addition, several statistical analyses in this section confirm the measurement models in this study. Accordingly, it can be concluded that the proposed path model has a satisfactory level of validity and reliability. Therefore, the research can safely move toward the structural model analysis and test the proposed hypotheses.

Table 3 Discriminant validity – HTMT correlation matrix

	EE	FC	BI	PI	PE	PV	PR	SE	SN	MO
EE	-									
FC	0.053	-								
BI	0.060	0.520	-							
PI	0.046	0.578	0.640	-						
PE	0.046	0.617	0.626	0.514	-					
PV	0.089	0.621	0.514	0.458	0.449	-				
PR	0.063	0.562	0.692	0.581	0.583	0.491	-			
SE	0.047	0.367	0.446	0.326	0.282	0.320	0.444	-		
SN	0.025	0.509	0.690	0.833	0.625	0.481	0.597	0.337	-	
MO	0.071	0.548	0.682	0.608	0.525	0.495	0.806	0.745	0.598	-

4.2 PLS-SEM structural (inner) model

The next step in the PLS analysis after confirming the measurement model met the conventional standards of reliability and validity is the evaluation of the structural model and testing the proposed hypotheses. Thus, to know the main effect model and assessing the significance level of the (path coefficients-β), the direct relationships were tested by PLS bootstrapping procedures with 5000 re-sampling was employed using SmartPLS Version 3.2.3 (Hair et al., 2013, 2014; Valerie, 2012). The results are presented in Table 4 and Figure 4. In terms of the structural paths, the results of both standardised path coefficients and their significant values were used for hypotheses testing.

Table 4 Result of hypotheses testing (path coefficients-β) of the study

No.	Relationship		Standard beta	Standard error	T-value	P-value	Sig.	Decision
	IV	DV						
H1	PE	→ BI	0.217	0.066	3.273	0.001	Sig. +	Supported***
H2	EE	→ BI	0.020	0.042	0.473	0.636	N.S.	Not supported
H3	SI	→ BI	0.298	0.060	5.011	0.000	Sig. +	Supported****
H4	FC	→ BI	-0.063	0.061	1.031	0.302	N.S.	Not supported
H5	MO	→ BI	0.085	0.074	1.137	0.255	N.S.	Not supported
H6	PV	→ BI	0.111	0.059	1.874	0.061	Sig. +	Supported*
H7	SE	→ BI	0.103	0.052	1.967	0.049	Sig. +	Supported**
H8	PR	→ BI	0.238	0.073	3.243	0.001	Sig. +	Supported***

Notes: The direct hypothesis is tested at two-tailed.

N.S.: Not significant, Sig.: Significant, (+) Positive relationship.

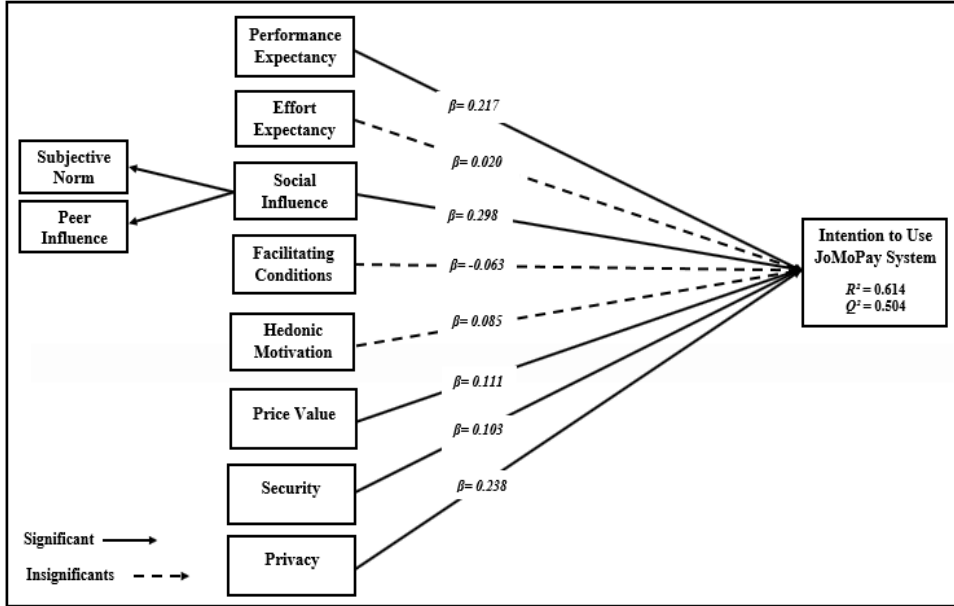
Significant at P**** = < 0.001, P*** = < 0.01, p** < 0.05, p* < 0.10, and

N.S. p = > 0.10.

Table 4 and Figure 4 presents a summary of the result of hypotheses testing (path coefficients-β) of the research hypotheses. The results mainly show that behavioural intention to use JoMoPay system is significantly and positively influenced by performance expectancy, social influence, price value, security and privacy. Social

influence is the most influential driver of JoMoPay system services acceptance (with T-value: 5.011, P-value: 0.000). Based on that, all related hypotheses were supported. Conversely, the results show that insignificant relationships between effort expectancy, facilitating condition and hedonic motivation on behavioural intention to use JoMoPay system services and hence the related hypotheses were not supported.

Figure 4 Research Model Results (β , R^2 & Q^2)



As expected, performance expectancy, social influence and price value were found to have a significant impact on the Jordanian public sector employees intentions to use JoMoPay system services. This result aligns with the work conducted by Venkatesh et al. (2003) and Venkatesh et al. (2012) in the UTAUT, and UTAUT2 model which states that performance expectancy, social influence and price value serve as the direct determinants of a user's tendency to adopt any new technology. With regard to the relationship between security and privacy with the behavioural intention to use JoMoPay system, this study hypothesised that security and privacy would have a significant influence on the intention to use JoMoPay system. Results indicate that there is a significant relationship between security and privacy on Jordanian public sector employees intentions to use JoMoPay system services. These findings are consistent with some previous findings of other studies (e.g., Singh and Srivastava, 2018; Liébana-Cabanillas et al., 2018; Jun et al., 2018; Chopdar et al., 2018) which argue that increased security and privacy leads to an increased behavioural intention to use such systems.

Unexpectedly, the study findings reveal that insignificant relationship between effort expectancy and behavioural intention to use JoMoPay system. Such result contradicts with the work of Venkatesh et al. (2003, 2012) in both UTAUT and UTAUT2 model. This implies that Jordanian public sector employees do not place much importance on the complexity of JoMoPay system to assert their intention to use it. Thus, the above

reasons suggest that effort expectancy of this relatively new mobile-based technology is less important (Ling et al., 2020; Qasim and Abu-Shanab, 2016; Faria, 2012).

Moreover, empirical results of the present study yielded insignificant relationship between facilitating conditions and behavioural intention to use JoMoPay system. This means that the infrastructure of electronic resources and employees' knowledge are not crucial barriers in the acceptance of JoMoPay system. This essentially due to the fact that people in Jordan put less weight on having regulations from the CBJ to help them use JoMoPay system services, thus they did not perceive it to be important. This result contradicts with what was reported in some earlier studies in the information system field (Venkatesh et al., 2003, 2012), but is consistent with many others studies (Makanyeza and Mutambayashata, 2018; Gupta et al., 2018; Acheampong et al., 2018; El-Masri and Tarhini, 2017; Alalwan et al., 2016; Oliveira et al., 2016; Baptista and Oliveira, 2015).

Finally, with regard to the role of hedonic motivation, this study predicts that the hedonic motivation would have a significant effect on the Jordanian public sector employees intentions to use JoMoPay system services. Conversely, statistical results provide weak evidence related to the effect of hedonic motivation in shaping employees' intention to use JoMoPay system services. Accordingly, results did not support the postulated hypothesis that there is a significant relationship between hedonic motivation and the behavioural intention to use JoMoPay system. Consequently, the hypothesis is rejected. This finding is not consistent with some of the earlier studies which used the UTAUT2 model in various contexts (e.g., Rita et al., 2018; Gupta et al., 2018) where they reported that hedonic motivation has insignificantly influenced intention to use mobile services. In addition, the researchers justified that such a new mobile payment system is not characterised to be fun (enjoyment and entertainment constructs). This may lead the Jordanian public sector employees to consider it to be unenjoyable, creating both negative emotion and feeling of personal dissatisfaction about JoMoPay system services, hence, not contributing significantly on the intention to use JoMoPay system services.

To sum up, the proposed model was tested based on the data collected from the 270 employees who are working within the Jordanian public sector located in the capital city (Amman city). The results of PLS-SEM analysis have been presented in relation to the different relationships among eight exogenous variables (e.g., performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, security and privacy) and one endogenous variable (e.g., behavioural intention to use JoMoPay system). While the empirical results confirmed that behavioural intention to use JoMoPay system is significantly and positively influenced by performance expectancy, social influence, price value, security and privacy. It is also worth mentioning that the integrated model of this study (JoMoPay system acceptance model) can explain approximately 61.4% of the variance in the behavioural intention to use JoMoPay system.

5 Conclusions and implications

The objective of this study is to determine factors that influence JoMoPay system usage in the Jordanian context. Thus, in line with that, this study offered new clarifications about the acceptance of mobile payment systems using the UTAUT2 model in Jordan. To conclude, the major factors that affect the intention to use JoMoPay system among Jordanian public sector employees are performance expectancy, social influence, price

value, security and privacy while effort expectancy, facilitating condition and hedonic motivation seems not relevant. Accordingly, the output of this research has significant theoretical, practical and methodological implications, which will be explained in details in the following subsections.

5.1 Theoretical implication

The current study has successfully extended the UTAUT2 model in the e-payment systems context in general and in m-payment systems context in particular. However, the original UTAUT2 model consists of seven constructs as determinants of behavioural intention. This study dropped one predictor of behavioural intentions and added four new critical sub-constructs related to individual and system characteristics, keeping six of the main constructs in the original UTAUT2 model to investigate the acceptance of JoMoPay system among Jordanian public sector employees. It is worth mentioning that UTAUT2 model has not been conducted before in the Jordanian mobile payment context. Accordingly, the use of UTAUT2 in the present study is considered a major contribution to the domain.

In this regard, the use of multilevel model and theories to explain the phenomena of adoption could overcome any blind-spots in a single model or theory (Reimers et al., 2010; Robey et al., 2008). Thus, this study has adopted the UTAUT2 model to clarify the JoMoPay system acceptance from the employees' perspective in the Jordanian public sector. UTAUT has been formulated based on the incorporation of eight major theories and models of technology acceptance (Venkatesh et al., 2003, 2012) while UTAUT2 is the latest among them. By doing so, the predictive and explanatory power of UTAUT2 model increases suggesting that each of the practitioners and academicians about the acceptance rate of the mobile payment system at the regional level.

In short, it can be concluded that one of the main contributions of this study is the empirical validation of a set of important factors, which are related to JoMoPay system acceptance. Most importantly, the current study introduced new factors as the subjective norm, peer influence, security and privacy into the UTAUT2 model and tested how these critical factors determined employees' intentions to use JoMoPay system in the Jordanian context.

5.2 Practical implication

In light of the practical implication, this study is practically beneficial for the CBJ including policy and decision-makers. The outcome of this study will provide critical indicators and useful information regarding the JoMoPay system acceptance in Jordanian institutions. Accordingly, these important indicators would aid in discovering factors that motivate and impede the acceptance of JoMoPay system among public sector employees in Jordan. The study also attempts to help decision-makers to formulate efficient programs and means to stimulate citizens' awareness of the benefits of the use of JoMoPay system services. In a related context, the empirical results of this study can provide important input to develop better plans and design appropriate programs and policies toward growing the rate of acceptance and diffusion of JoMoPay system. Thus, more comprehensive deployment of JoMoPay system ensures better efficiency to increase and enhance financial inclusion in the country.

Another critical contribution arising from the research is the recommendations to treat the Jordanian public sector employees as customers. The public sector employees are given new ideas and can be trained to investigate the benefits of using JoMoPay system. The proposed educational training should focus on the benefits to save time, effort and money. The results of the current study offer significant benefits not only for employees who have bank accounts, but also for those who do not have bank accounts and working in public sector either inside or outside Jordan. Those recommendations are aligned with the financial inclusion that aims to provide formal financial services for the excluded and deprived groups. To achieve such goals, several practical recommendations have been identified, such as developing and improving payment methods among employees to use JoMoPay system, encouraging employees to leverage the JoMoPay system services, and raising the rate of acceptance of JoMoPay system among employees. Finally, the results of this study also offer a general guideline for both services users and services providers on how to make payment transactions and purchase via JoMoPay system.

5.3 Methodological implication

In terms of methodological implication, this study has numerous important contributions in methodological perspective. For instance, the previous studies with respect to the mobile payment systems in Jordan context were conducted among students in an educational institution environment (e.g., Qasim and Abu-Shanab, 2016; Jaradat and Al-Mashaqba, 2014; Jaradat and Faqih, 2014), while this study is focused on employees who are working in public sector organisations. Consequently, there is a scarcity of empirical studies related to the mobile payment system in the context of Jordan. Based on the principle investigator knowledge, there are only three previous studies that investigate the acceptance of the mobile payment system among students in Jordanian educational institution environment. Therefore, consider the current work is the first empirical study conducted on acceptance of JoMoPay system among public sector employees in Jordan while the parameters related to the different population and sampling size in this study can be considered as a methodological contribution.

The current study also contributed to the methodological perspective by measuring the different constructs related to the acceptance of mobile payment systems by adapting the same proposed instruments (measurement items of constructs) used in this study. Since most of the items of these constructs showed high reliability and validity to measured mobile payment systems acceptance, the study results were confirmed through conducting all the tests related to the validity and reliability on data collected (instruments). A pilot study was first conducted to ensure the clarity, the validity, the reliability, and the accuracy of the survey measured items. Hence, this study contributes to the methodological aspect by further validate the measurement items and compare the results obtained (correlated to sample size, Arabic measurement items, and Jordanian public sector employees) with other results in different contexts.

Moreover, the methodology applied in this study gives new guidelines for future research. Firstly, the style of surveying for employees who are working in public sector organisations in Jordan. In this regard, because Jordanian public sector employees stay overall around Jordan, the distribution of surveys by the person is recommended. Secondly, the survey language and design. From the survey perspective, the survey was carefully designed to ensure a higher responses rate by providing clear instructions and an introductory letter. Lastly, the use of SEM approach with SmartPLS Version 3.2.3 to

test and analysing the research proposed model in the Jordanian context. Thus, all of these procedures can be considered as a methodological contribution.

To summarise this section, the results of this study have a significant contribution to the theory methodology. It also provides clear recommendations to practitioners and managers in the areas of JoMoPay system to enhance the system acceptance. Those contributions are explained in details in the sections mentioned above. It is should be noted that the use of UTAUT2 model in one of the Arab world countries (Jordan) is a unique contribution to the existing literature context. Thus, the current section has presented several implications and contributions, which involve theoretical, practical and methodological contributions based on utilising the UTAUT2 model framework.

6 Research limitations and future directions

Like other studies, this study is not free from limitations. Although this study represents a valuable study to understand the acceptance of JoMoPay system, it is restricted by the number of limitations that should be considered in future research:

Firstly, this study is only limited to Jordan. Such issue limits the generalisability of the result. With respect to the sample, the data of the current study is collected by using a purposive sample of Jordanian ministries of employees from ministries located in Amman city only (the capital city of Jordan). The study sample could negatively reflect on the generalisability of results across other cities within Jordan. Therefore, similar studies in different cities are required especially in rural areas, where higher percentages of the population do not have bank accounts to ensure the validity of results and thus, the generalisability of results.

Secondly, the study is only limited to one particular mobile payment system. In order to reach further generalisability on the applicability of UTAUT2 model in the technology use context, future studies should focus on replicating and utilising the same the theoretical framework used in this study with other mobile systems (e.g., mobile money, mobile wallet, mobile banking, mobile learning, mobile government, mobile digital TV, and NFC m-payments in hotels). Future studies can also target other electronic systems (e.g., e.FAWATEER.com system, e-health record system, e-learning, online banking, internet shopping, online purchasing tickets, and, airline self-service check-in), and different technology applications (e.g., payment, government, health informatics, education, and hotels). Therefore, further studies are definitely required in the technology sector to enhance and verify the validity and applicability of this framework by applying it in different contexts.

Last but not least, it is worth mentioning that the researchers faced some challenges when they distributed the questionnaires in some ministries. For instance, some managers did not agree to let their employees spend some time to answer the questionnaires. Similarly, some employees also refused to spend their time to answer the questions; while others reject to answer the questioner because they do not have any knowledge about JoMoPay system. Therefore, the data collection of this study faced several challenges despite the efforts made at obtaining strong and reasonable results.

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Appendix

Measurement items

<i>Constructs</i>	<i>Code</i>	<i>Measurement items</i>	<i>Sources</i>
Performance expectancy	PE1	I think JoMoPay system could be useful in my daily life.	Venkatesh et al. (2012)
	PE2	Using JoMoPay system could increase my chances of achieving things that are important to me. (dropped)	
	PE3	Using JoMoPay system could help me accomplish things more quickly.	
	PE4	Using JoMoPay system could increase my productivity.	
Effort expectancy	EE1	Learning how to use JoMoPay system would be easy for me. (dropped)	Venkatesh et al. (2012)
	EE2	My interaction with JoMoPay system would be clear and understandable.	
	EE3	I would find JoMoPay system easy to use.	
	EE4	It would be easy for me to become skillful at using JoMoPay system.	
Subjective norm	SN1	People who are important to me think that I should use JoMoPay system.	Ajzen (1991), Venkatesh et al. (2012) and Faqih (2016)
	SN2	People who influence my behavior think that I should use JoMoPay system.	
	SN3	People whose opinions valuable the most will prefer that I use JoMoPay system.	
	SN4	People in the ministry who use JoMoPay system have a high profile.	
Peer influence	PI1	My friends would think that I should use the JoMoPay system.	Taylor and Todd, (1995), Hsieh et al. (2008) and Brown et al. (2010)
	PI2	My relatives would think that I should use JoMoPay system.	
	PI3	My peers would think that I should use JoMoPay system.	
	PI4	My co-workers would believe that I should use JoMoPay system.	
Facilitating conditions	FC1	I have the resources necessary to use JoMoPay system.	Venkatesh et al. (2012)
	FC2	I have the knowledge necessary to use JoMoPay system.	
	FC3	JoMoPay system is compatible with other systems and technologies that I use.	
	FC4	I can get help from others when I have difficulties using JoMoPay system.	
Hedonic motivation	MO1	Using JoMoPay system is fun.	Venkatesh et al. (2012)
	MO2	Using JoMoPay system is enjoyable.	
	MO3	Using JoMoPay system is very entertaining.	

Measurement items (continued)

<i>Constructs</i>	<i>Code</i>	<i>Measurement items</i>	<i>Sources</i>
Price value	PV1	JoMoPay system is reasonably priced.	Venkatesh et al. (2012)
	PV2	JoMoPay system are reasonably priced comparing with other systems (e.g. mobile banking system).	
	PV3	JoMoPay system services is a good value for the fees.	
	PV4	At the current price, I think JoMoPay system will provide a reasonable and good value.	
Security	SE1	I would not be worried about the security of financial transaction on JoMoPay system.	Casaló et al. (2007)
	SE2	I think JoMoPay system has the mechanisms to ensure the safe transmission of its users' information. (dropped)	
	SE3	I would know for sure of the identity of JoMoPay system when I establish contact via the system.	
	SE4	I am sure that the information sent via JoMoPay system will not be intercepted by unauthorised third parties or modified. (dropped)	
	SE5	I think JoMoPay system has sufficient technical capability to ensure that the transmitted data will not be intercepted by third parties or hackers.	
Privacy	PR1	I would feel safe when I send personal information via JoMoPay system.	Casaló et al. (2007)
	PR2	I think JoMoPay system has high commit to ensure the privacy of its users.	
	PR3	I think JoMoPay system complies with the personal data protection laws.	
	PR4	I think JoMoPay system only collects user's personal data that will only be necessary for its activity.	
	PR5	I think JoMoPay system respect the user's rights when obtaining personal information.	
	PR6	I think that JoMoPay system would not provide my personal information to other companies without my consent.	
Behavioural intention	BI1	I intend to use JoMoPay system in the future.	Venkatesh et al. (2012) and Venkatesh et al. (2003)
	BI2	I would likely use JoMoPay system in my daily life whenever it is possible.	
	BI3	I am planning to use JoMoPay system frequently.	
	BI4	I predict that I would be using the JoMoPay system in the near future.	