



Examine the Important Factors Influencing the Adoption of E-Wallets among Students in the Kurdistan Region of Iraq

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دراسة العوامل الهامة المؤثرة على اعتماد المحافظ الالكترونية بين طلبة إقليم كردستان في العراق

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Abstract

E-Wallets have emerged as a prominent subject in scholarly literature and various research fields, yet there is a lack of focus on the crucial factors affecting their adoption, particularly among college students at an individual level. Additionally, only a handful of researchers have examined the concepts related to e-wallets in specific contexts. This study aims to integrate and validate the TAM and TRA theories that elucidate the benefits of E-wallet adoption in Iraq while addressing the key factors influencing E-Wallet adoption among college students in the Kurdistan Region of Iraq. A quantitative methodology is employed in this study to assess its hypotheses and gain a deeper understanding of potential relationships among different factors. The T-test, Reliability, Correlation, and Frequency analyses are conducted using the SPSS-structured analysis. The findings indicate that Perceived Usefulness, Perceived Ease of Use, and Subjective Norms significantly affect E-Wallet adoption, while attitudes were not supported due to their lack of impact. These factors are the primary drivers of students' willingness to adopt e-wallets. The conceptual framework presented in this paper enhances the application of TAM and TRA, potentially providing scholars and practitioners with valuable insights for future empirical research.

Keywords: E-wallet, Adoption, Mobile-wallet, TAM, TRA.



المستخلص

ظهرت المحافظ الالكترونية في الادبيات العلمية البارزة والعديد من البحوث (الحقول البحثية)، ومع ذلك هناك نقص بالتركيز على العوامل الحاسمة التي تؤثر على اعتمادها وخاصة بين الطلاب في الكليات وعلى المستوى الفردي ، بالإضافة لذلك هناك قلة من الباحثين الذين تفحصوا أو درسوا المفاهيم المتعلقة بالمحافظ الالكترونية في مجلات محددة .

تهدف هذه الدراسة الى التحقق من صحة نظريتي (TAM او TRA) التي تتعلق بالانتقاع (الاستفاده) من اعتماد المحافظ الالكترونية في العراق مع معالجة العوامل الرئيسية التي تؤثر على اعتماد المحفظة الالكترونية بين طلبة الكليات في إقليم كردستان في العراق ، لقد استخدمت في هذه الدراسة منهجية كمية لتقديم فرضياتها والحصول على استيعاب (منهم) معمق للعلاقات المحتملة بين مختلف العوامل .

اختبار T ، الموثوقية ، الارتباط ، تحليل التردد (التكرارات) و التي أجريت باستخدام التحليل الهيكلي للبرنامج الاحصائي (SPSS). لقد إشارة النتائج الى وجود فائدة ملموسة وسهولة مدركة للاستخدام فضلاً عنه معايير موضوعية ذو تأثير معنوي على استخدام المحفظة بينما كانت المواقف والاتجاهات ذو تأثير غير داعي .

ان هذه العوامل مشقة (منشقة) اساساً من رغبات الطلبة في اعتماد المحافظ الالكترونية. أن الاطار المفاهيمي المقدم في هذه الورقة يعزز تطبيق نظريتي TAM , TRA ومن المحتمل ان يقد او يوفر للباحثين والعلماء والممارسين رؤى قيمة للبحوث التجريبية المستقلة.

الكلمات المفتاحية: المحفظة الالكترونية، التأقلم والمحافظ الالكتروني والعوامل

المؤثرة.



1 - Introduction

In today's world, cell phones have become an essential part of daily life. With increasing affordability, the number of cell phone users has grown dramatically, surpassing 1 billion in 2012 and predicted to reach 1.75 billion in 2014 (eMarketer, 2014). Alongside the growth in cell phone production, numerous advancements have been made to maximize their potential capabilities. Smartphones are not only used as communication devices but also as socialization tools, entertainment platforms, web ticketing, and even payment systems (Rajgopal, 2012).

Innovations in technology have enabled mobile users to conduct monetary transactions or payments using applications installed on their smartphones. In addition to payments, users can store receipts, coupons, business cards, and bills on their phones (Erickson, 2013). When cell phones function as e-wallets, they are called electronic wallets or "Mobile wallets" (Rajgopal, 2012). Electronic payment methods are gaining popularity with a solid push to digitise various life aspects. E-wallets have experienced significant growth in many countries following recent technological advancements. Initiatives promoting development will facilitate the adoption of electronic payment systems, including E-wallets, and support the transition from a cash-based economy to a cashless one (Sen, 2016).

E-Wallets offer the convenience of conducting transactions for goods and services from various devices, such as mobile phones and smartphones (Bhasker, 2016). E-Wallet technology can benefit payments, investments, ticketing, and electronic fee and fare payments. As a versatile payment instrument, e-wallets offer users innovative features and multiple offers for enhanced convenience (Cox, 2013).



In Iraq, consumer preferences have shifted significantly towards technology, better networking, and resource utilization. Approximately 70% of the Iraqi population uses electronic banking for professional and personal activities. Iraq has experienced considerable growth in technological advancements and is expected to continue this trend over the next five years due to its convenience and ease of use. Young Iraqis are increasingly drawn to new technologies like e-wallets (Varghese, 2012) because they enjoy using them and prefer them for all their banking needs. However, few studies have analyzed the scope of e-wallet payment services and identified factors affecting consumer perceptions and adoption of this new technology (Silbert, 2015). Moreover, limited research is available on the Middle East context, specifically Iraq. This paper is unique in that it includes variables not yet studied concerning e-wallets and examines the relationship between them.

2 - Literature Review and Research Hypotheses E-Wallet

The concept of a versatile wallet had evolved from the "Digital Wallet" idea, which dates back to 1996 when Sam Pitroda filed a patent in the United States for a digital wallet [see (Sam Pitroda Patents)]. He envisioned a digital wallet to consist of a small liquid crystal display, slightly larger than a regular plastic bank card, with a touch-sensitive screen and simple user interface that allows users to navigate through the digital wallet as they would a physical wallet. An e-wallet is a software application on a smartphone that serves as a digital container for payment cards, tickets, loyalty cards, receipts, vouchers, and other items that might be found in a physical wallet. The mobile wallet enables users to manage multiple transactions, and it takes the form of an e-wallet when a cell phone functions as a traditional wallet, housing digital



coupons, digital cash transfers, digital cards, digital receipts, etc., all within the device (Carrington, 2014). This means users install applications developed by companies like Google Inc., Apple Inc., or PayPal on their smartphones and use those apps to pay directly for products purchased online.

E-wallets now play a crucial role in personal and professional transactions, as more people use their mobile phones for payments, money transfers, trade, and commerce daily. This has resulted in rapid development of various mobile payment models and systems. In recent years, substantial research efforts have been directed toward creating secure mobile payment solutions. Current research on e-wallet systems primarily focuses on the technological aspects, particularly functionality issues. However, research should shift toward the business aspects of e-wallet payments, such as user adoption processes, strengths and weaknesses of existing systems, user perceptions, system usability, user attitudes, and perceived usefulness of e-wallets (Stringer, 2014). Therefore, it is challenging to authenticate mobile users remotely and ensure non-repudiation of transactions.

Kevin Erickson (2013) identifies several features that e-wallets should offer users (Erickson, 2013):

- Display and store coupons or offers from businesses that customers have engaged with
- Identify real-time discounts and offers from various commercial venues
- Provide search engines and rating tools for restaurants and shops based on location
- Act as a payment tool with credit and debit cards
- Organize receipts



For any business, customer acceptance is essential. Innovative technology alone is not enough to persuade customers to use e-wallets. As a result, gaining consumer adoption is vital. Interestingly, paying via smartphone through an e-wallet has become increasingly attractive to consumers, primarily through marketing and loyalty programs (Stringer, 2014). The success of Starbucks' mobile wallet application serves as a prime example. According to a Forbes article by Steven Bertoni (2014), Starbucks' mobile wallet is the most used in America, with about 10 million customers paying for their lattes through the app and making more than 5 million transactions weekly (Bertoni, 2014). Its loyalty program has been designed to enable users to experience all available marketing campaigns directly from their smartphones, which instantly offer discounts for free coffee or food and link directly to Starbucks' real-time reward program (Bertoni, 2014). This factor must be carefully considered when companies plan to launch mobile wallets for their businesses.

In technology implementation, "adoption" implies a positive value and confidence (Wang, *et al.*, 2011). Adopters embrace technology rather than rejecters who choose not to adopt or non-adopters who have yet to begin the process of becoming adopters (Zenobia, 2008). Numerous adoption theories have been applied in various contexts at both organizational and individual levels to understand an individual's perception of technology (Ha and Stoel, 2009; Shin, 2009; Yang, 2012). This research uses a theoretical foundation from the literature to construct knowledge related to users' perceptions and formulate hypotheses. The most appropriate theories for predicting users' acceptance of e-wallet adoption are the Technology Acceptance Model (TAM) and the Theory of Reasoned Action (TRA), among other theories that may not be as well-suited for this study.



The Technology Acceptance Model (TAM) was developed to explain and predict user acceptance of information systems by focusing on two main factors: perceived usefulness and perceived ease of use (Davis, 1989). Perceived usefulness refers to the degree to which a person believes that using a particular system would enhance their job performance, while perceived ease of use is the degree to which a person believes that using the system would be free of effort. Research has shown that these factors significantly influence users' attitudes toward technology adoption and their actual usage behavior (Venkatesh and Davis, 2000).

The Theory of Reasoned Action (TRA) is a social psychology model that seeks to predict and explain individual behavior in various contexts (Fishbein and Ajzen, 1975). The model posits that an individual's intention to perform a specific behavior is determined by their attitude toward that behavior and the subjective norms surrounding it. Attitude refers to the individual's overall evaluation of the behavior, while subjective norms refer to the perceived social pressure to perform or not perform the behavior. In e-wallet adoption, TRA can help identify factors influencing users' intentions to adopt e-wallets, such as social influences and personal evaluations of the technology.

By combining and validating TAM and TRA theories, researchers can better understand the critical factors influencing e-wallet adoption among individuals, particularly college students, in specific regions, such as the Kurdistan Region of Iraq. This approach will also help academics and practitioners develop valuable insights for further empirical research and practical implementation of e-wallet technologies. As e-wallets continue to gain popularity worldwide, understanding the factors that drive user adoption is crucial for businesses, policymakers, and technology developers



to create more effective strategies for promoting e-wallet usage and fostering a more seamless transition to a cashless economy.

Table 1, Theoretical Foundation

Theory Name	Author	Findings
Technology Acceptance Model	(Davis,1986)	This theory explains the user’s acknowledgement of computing innovations in the association.
Innovation Diffusion Theory	(Rogers,1962)	It explains how, after some time, a thought or item picks up energy and diffuses through an explicit population or social framework
Unified Theory of Acceptance and Use of Technology	(Venkatesh et al., 2003)	Explain user intention to use an information system and subsequent usage behaviour.
Theory of reasoned action	(Ajzen, Fishbein, 1980)	Effort to understand the relationship between attitude and behaviour

A) Conceptual Model

In this study, an endeavor has been undertaken to establish a connection between selected variables derived from the Technology Acceptance Model (TAM) and the Theory of Reasoned Action (TRA). These variables include perceived usefulness, perceived ease of use, attitude, and subjective norm. The rationale for integrating these two theories is that TRA aims to elucidate the behavioral considerations involved in making informed decisions before implementing new technology, while TAM concentrates on the user's decision to embrace or reject the technology. Figure 1 (not provided)



illustrates the conceptual model that combines the theories and outlines the variables.

The conceptual model encompasses the following components:

1. Perceived Usefulness (TAM): The degree to which a user believes using a specific technology will enhance their performance or facilitate goal attainment.
2. Perceived Ease of Use (TAM): The degree to which a user believes that employing the technology will be simple and not require significant learning or adaptation.
3. Attitude (TRA): The user's comprehensive assessment of the technology, incorporating their emotions, beliefs, and intentions concerning adoption and utilization.
4. Subjective Norm (TRA): The perceived social pressure from peers, family, or society influences a user's decision to adopt or reject the technology.

The relationships between these variables can be hypothesized as follows: • Perceived Usefulness positively affects Attitude. • Perceived Ease of Use has a positive effect on Attitude. • Attitude has a positive effect on the Intention to Adopt the technology. • Subjective Norm positively affects the Intention to Adopt the technology.

By examining the relationships between these variables, the integrated TAM and TRA conceptual model can provide valuable insights into users' decision-making processes when considering the adoption of e-wallet technology. This information can subsequently be utilized to tailor marketing and implementation strategies to address the key factors that drive user adoption and promote the widespread adoption of e-wallets.

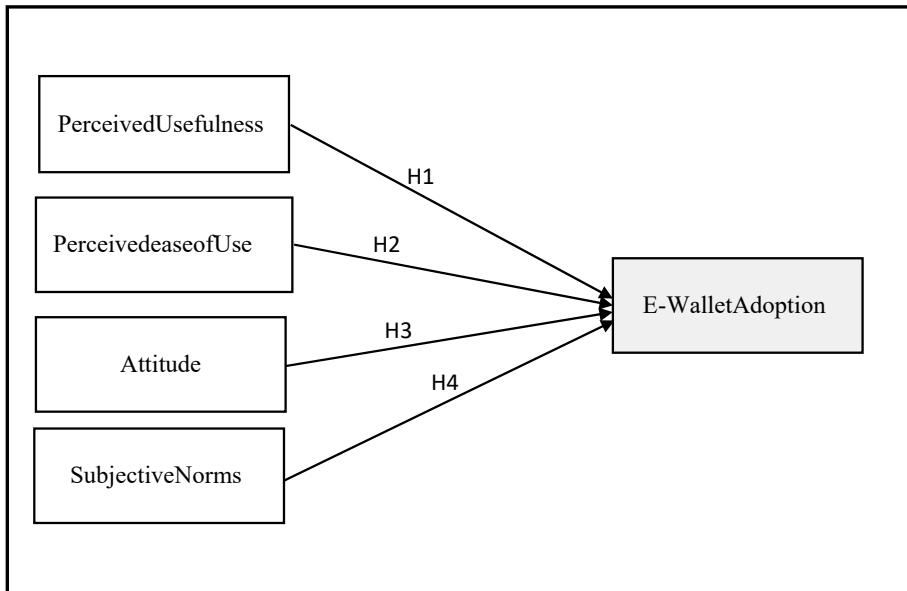


Figure1, Conceptual Model

B) Perceived Usefulness

Perceived Usefulness (PU) is defined as "the extent to which an individual believes that using a specific technology will enhance their job performance" (Davis, 1989). Within the TAM framework, PU is hypothesized to directly predict the behavioral intention to use (BI) the technology in question (Park, *et al.*, 2014). Past research indicates a positive association between PU and continuance intention in various contexts, including e-text (Baker-Eveleth & Stone, 2015; Stone & Baker-Eveleth, 2013), instant messaging (Wang, Ngai & Wei, 2011), mobile service providers (Abbas & Hamdy, 2015), and online travel services (Li & Liu, 2014).

PU describes the enhancement achieved by utilising application systems, resulting in improved outcomes (Wang, Ngai, & Wei, 2011).



Concerning this study, PU indicates that an e-wallet system could contribute to increased satisfaction from the effort expended (Lin & Wang, 2012).

H1: Perceived usefulness will positively impact the adoption of the e-wallet system.

Perceived Ease of Use

Perceived Ease of Use (PEOU) refers to "the degree to which an individual believes that using a technology will be free from effort" (Davis, 1989). In this study, PEOU represents the extent users believe their continued use of e-wallets requires minimal effort. A relatively easy system will encourage individuals to explore its features and ultimately intend to continue using it. PEOU reflects the advantages of technology that can be utilized effortlessly, resulting in quicker and more convenient experiences for users in managing financial transactions and purchases (Chiu & Wang, 2008).

H2: Perceived ease of use will positively affect the use of the e-wallet system.

Attitude

Attitude represents the tangible reactions or responses to an individual's thoughts and perspectives regarding the consequences of their behavior (Riketta, 2009; Hassan, *et al.*, 2022b). Introducing e-wallets as a novel technology among students may generate various perspectives. Students' attitudes towards this new system will influence their positive or negative behavior regarding e-wallet adoption, signifying the population's readiness (Carpenter, *et al.*, 2009).

H3: Attitude towards behavior will positively influence the adoption of an e-wallet.



Subjective Norms

Subjective norms stem from normative beliefs, resulting in perceived social pressure (Kumar, 2012). These norms relate to an individual's perception of social pressure from significant others (e.g., family, friends, colleagues) to engage (or not) in specific behaviors and their motivation to comply with those individuals' opinions (Amran & Nee, 2012; Saleki, Seydsaleki & Rahimi, 2012). Subjective norms also encompass the critical reactions that shape others' perceptions of appropriate conduct in achieving objectives.

H4: Subjective norms will positively affect the behavioral intention to use e-wallets.

3 - Research Methodology

This study employs a quantitative approach to gather primary data, focusing on statistical results from respondents. The quantitative method emphasizes the testing and verifying of facts and causality in social occurrences, enabling the generalization of findings from the population (Ghauri P., Grhaug K., 2010; Hassan, *et al.*, 2022a). The quantitative approach addresses the research questions concerning the factors influencing e-wallet adoption in the Kurdistan Region of Iraq and the manner of e-wallet adoption. In addition to primary data, this investigation incorporates secondary data from a literature review using predefined keywords to support the theories employed.

A questionnaire serves as the primary quantitative technique in this study. The survey, created using the online application Survey Monkey, is based on factors impacting e-wallet adoption. The research aims to examine the effects of these variables and elucidate their interactions (Hassan, *et al.*, 2021).



At the beginning of the survey, respondents receive an introduction to the e-wallet concept and a verbal explanation. The questionnaire is distributed to potential respondents in the Kurdistan Region of Iraq via Facebook messaging, with a two-week deadline for submission. Out of 200 individuals, 191 responded, yielding a 91% response rate. The remaining 9 respondents failed to meet the researcher's deadline.

4 - Results and Findings

This section discusses the data analysis and study findings in detail. The statistics for independent and dependent variables are thoroughly examined and presented, providing a comprehensive understanding of the variables' characteristics and distribution. Additionally, the correlations between the variables are meticulously assessed to identify any significant relationships or patterns among them.

Hypotheses are rigorously tested using appropriate statistical techniques to validate the findings further. This process enables the researcher to determine the level of support for each hypothesis based on the empirical evidence, ultimately leading to either acceptance or rejection of the hypotheses. The outcomes of these tests are then interpreted and discussed in the context of the study's objectives and existing literature.

This section aims to provide valuable insights into the factors influencing e-wallet adoption in the Kurdistan Region of Iraq by presenting a comprehensive analysis of the data and a thorough examination of the hypotheses. The study results can then serve as a foundation for future research and contribute to a deeper understanding of the drivers and barriers to e-wallet adoption in various contexts.



Demographic

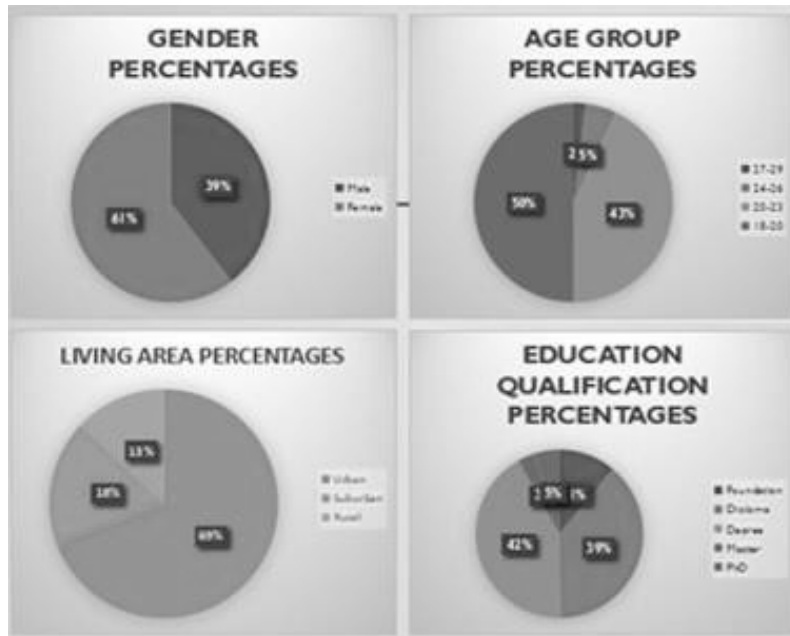


Figure 2, Demographic analysis

The demographic analysis of the 200 responses collected from students at colleges in the Kurdistan Region is presented through pie charts. These charts depict the distribution of participants based on various demographic factors, such as gender, age, financial background, and education level. Gender is utilized to investigate the potential differences in the outcomes that may influence the variables, while age is employed to analyze the variations in technology adoption between different age groups.

Furthermore, the financial background of the respondents is taken into account to ascertain the frequency with which users participate in financial transactions, providing insights into their experience and familiarity with financial technologies. Education level is another critical factor



considered in the analysis, as it may reveal disparities concerning the examined factors, shedding light on the relationship between education and e-wallet adoption.

By examining these demographic characteristics, the study aims to comprehensively understand the diverse factors that may influence e-wallet adoption among college students in the Kurdistan Region. This information can be valuable for tailoring e-wallet adoption strategies to meet different demographic groups' unique needs and preferences.

Independent sample T-Test

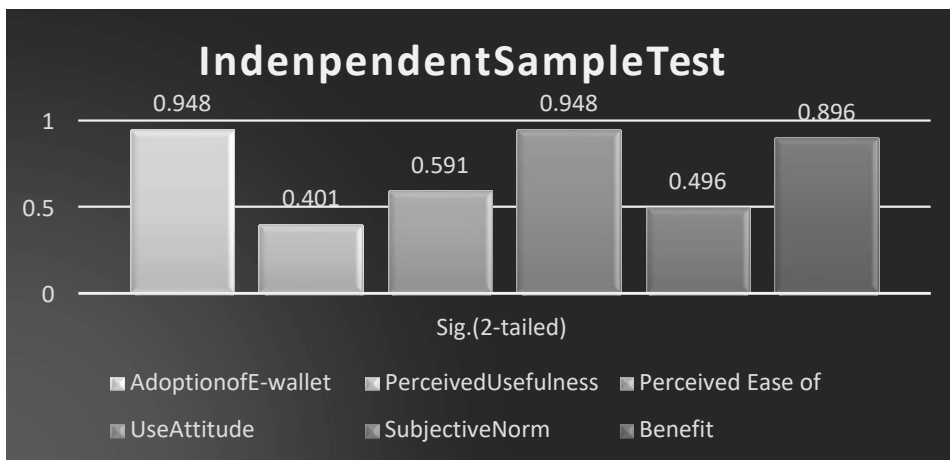


Figure 3, Independent sample T-test

As indicated by the independent sample t-test, the findings reveal that all p-values are above the 0.05 significance level, suggesting no statistically significant differences between the examined variables. The graph mentioned above illustrates the application of the independent sample t-test in connecting and comparing the other variables, using gender as a reference point. Among these comparisons, the relationship between the independent



variable, E-wallet adoption, and one of the dependent variables exhibits the highest p-value of 0.948, further emphasizing the absence of significant differences between the variables under consideration.

Hypothesis Testing

Table 2. Hypothesis Testing

Hypothesis	Standardized regression weight	CR	P	Result
Perceived usefulness → Customer's Adoption (H1)	0.262	2.524	0.012	Accepted
Perceived ease of use → Customer's Adoption (H2)	0.724	5.929	0.000	Accepted
Attitude → Customer's Adoption (H3)	0.068	0.924	0.356	Notaccepted
Subjective norms → Customer's Adoption (H4)	0.649	5.629	0.000	Accepted

Table 2 presents the outcomes of the hypothesis testing. The results indicate that users' decisions to adopt the e-wallet system were positively influenced by their perception of the new technology ($\beta = 0.262$, $p = 0.012$), thus supporting Hypothesis 1. Hypothesis 2 was also corroborated, as the perceived ease of use was found to have a significant impact on users' adoption ($\beta = 0.724$, $p < 0.001$). However, the users' adoption was not significantly influenced by attitude ($\beta = 0.068$, $p = 0.356$), leading to the rejection of Hypothesis 3. Finally, Hypothesis 4 was supported, as subjective norms were found to significantly affect users' adoption ($\beta = 0.649$, $p < 0.001$).



Correlation

Table 3. Correlation

		e-wallet	usefulness	ease	attitude	norm	benefit
e-wallet	PearsonCorrelation	1	.377**	.354**	-.239**	.227**	.330**
usefulness	PearsonCorrelation	.377**	1	.624**	.503**	.451**	.520**
ease	PearsonCorrelation	.354**	.624**	1	.615**	.496**	.533**
attitude	PearsonCorrelation	.239**	.503**	.615**	1	.615**	.571**
norm	PearsonCorrelation	.227**	.451**	.496**	.615**	1	.575**
benefit	PearsonCorrelation	.330**	.520**	.533**	.571**	.575**	1

Among the 200 respondents familiar with e-wallet technology, the independent variable of e-wallet adoption shows negative values compared to the descriptive statistics. Nevertheless, there are no negative responses for the dependent variables, as most students utilize e-wallets and recognize their benefits as college students in Iraq's Kurdistan Region.

The correlation analysis results can be interpreted using the following ranges:

- to 0.20 indicates no relationship between variables;
- 0.21 to 0.40 suggests a weak relationship between variables;
- 0.41 to 0.60 signifies a moderate relationship between variables;
- 0.61 to 0.80 denotes a strong relationship between variables;
- 0.81 to 1.00 implies a strong relationship between variables.

These ranges help to understand the strength and direction of relationships among the independent and dependent variables, providing insights into the factors influencing e-wallet adoption among college students in Iraq's Kurdistan Region.



5 - Practical Implication and Limitation

This study, which focuses on the business aspect and the primary function of e-wallets to facilitate financial transactions, has potential implications for organizational and managerial levels. As a company adopts e-wallets, transactions deviate from traditional methods, potentially saving time and encouraging subordinates to utilize the technology.

However, this study has limitations, as the 200 respondents may not adequately represent the entire population, and all respondents were college-age. Given the close association of e-wallets with the banking industry and technological advancements, future research should focus on the specific e-wallet applications within that sector. Additionally, future studies should concentrate on the in-depth analysis of individual e-wallet applications to better understand the factors influencing their adoption and usage.

6 - Conclusion

In conclusion, adopting and promoting e-wallets in the Kurdistan Region of Iraq is paramount for several reasons. Firstly, e-wallets create a more efficient and effective environment for financial transactions without completely replacing traditional methods. This enables a smoother transition for users hesitant to adopt new technologies.

Secondly, implementing e-wallets can drive significant economic growth for the region by streamlining financial transactions, reducing transaction costs, and promoting cashless transactions, which are known to increase transparency and reduce corruption. As the world moves towards the fourth industrial revolution, Iraq should prioritize innovation in financial transactions to keep pace with global trends and ensure sustainable development.



Iraq is undergoing a significant development process, and it is essential to foster a culture of innovation and acceptance of new technologies in the Industry 4.0. The findings of this study contribute to the existing body of research on e-wallets and the factors affecting their adoption in contemporary societies. However, more in-depth, context-specific research is needed to examine the potential mediating or moderating effects of various factors that may impact e-wallet usages, such as demographic factors, socioeconomic status, and technological infrastructure.

Additionally, from an organizational standpoint, it is crucial to consider the cultural context when studying the adoption and usage of e-wallets. Previous studies have highlighted the significance of cultural context in adoption decision-making, and it is essential to understand how cultural factors may influence the adoption and utilization of e-wallets within different societies and settings.

Future research should also investigate the role of government policies and regulations in promoting the adoption of e-wallets and the impact of public awareness campaigns and educational programs in facilitating the widespread use of this technology. By considering a comprehensive range of factors, researchers can gain a more holistic understanding of the challenges and opportunities associated with e-wallet adoption, enabling stakeholders to develop targeted strategies and interventions to support the integration of e-wallets into everyday life.



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