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ADOPTION OF MOBILE COMMERCE AND MOBILE PAYMENTS IN GHANA: AN EXAMINATION OF FACTORS INFLUENCING PUBLIC SERVANTS

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ABSTRACT

Aim/Purpose	Mobile commerce adoption is low in developing countries; hence, public servants may not consider mobile commerce and mobile payments. Understanding the factors that influence mobile commerce and mobile payments in their context will aid in promoting those services.
Background	The study investigates the factors that influence public servants' mobile commerce and mobile payments in Ghana. Hence, it provides some understanding of the various aspects of mobile commerce and mobile payments adoption, such as acceptance, use, and eventual adoption into the user's daily life, and how that affects their behaviour.
Methodology	The research was conducted by surveying the factors influencing public servants' adoption of mobile commerce and payments in Ghana. A cross-sectional survey was undertaken to put the research model to the test to measure the constructs and their relationships.
Contribution	The study confirmed previous findings and created a new conceptual model for mobile commerce and mobile payment adoption and usage in the Ghanaian context.

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Findings	The variables of performance expectancy, trust, and facilitating conditions have a significant positive influence on behavioural intention. The factors of effort expectation and social influence have a significant negative impact. Price value and perceived reliability are latent variables that do not affect behavioural intention. Behavioural intention and facilitating conditions significantly influence the actual use behaviour of mobile commerce and mobile payment users.
Recommendations for Practitioners	<p>Mobile commerce is emerging as a new mode of transactions, with firms providing enabling platforms for users. Mobile commerce could become the most acceptable application for the next generation of mobile platform applications. This study offers insights into the fluidity of the mobile environment, with implications that spell out what will be effective mobile commerce services that will continue to be relevant.</p> <p>Mobile applications are attractive to people because they provide a better user experience. These mobile applications have been optimised to provide a fast, easy and delightful experience. Mobile commerce and mobile payment service providers can attract and retain more users if attention is paid to performance expectancy, trust, and facilitating conditions since they influence individuals' decisions to adopt.</p> <p>Mobile technology is almost ubiquitous, influencing both online sales and in-store sales. With the right mobile commerce platform and features, businesses can expect to increase in-store and online sales, catering to a more extensive clientele. Mobile devices are the primary means that most customers use to look up information about products they see in stores, such as product reviews and pricing options. This study indicates that mobile commerce service providers can achieve a more extensive customer base by promoting performance expectancy, trust, and behavioural intentions.</p>
Recommendations for Researchers	Despite the numerous studies in the mobile commerce literature, few have used integrated models of perceived reliability, trust, and price value or methods to evaluate these factors in the emerging mobile commerce industry. Also, it combines mobile commerce and mobile payments, which very few that we know of have done.
Impact on Society	Ghana is already in a cash-lite economy. Thus, the study is appropriate with the result of trust being a significant factor. It implies that people will begin using mobile commerce and mobile payments with a bit of drive to bring about this drive quickly.
Future Research	Future research could further test the adapted model with moderating factors of age, gender, and education to delve deeper into the complexities of mobile commerce and mobile payments.
Keywords	mobile commerce, Ghanaian public servants, trust, behavioural intention, adoption

INTRODUCTION

With the introduction of mobile electronic commerce in 1997, Coca-Cola-enabled mobile-phone vending machines were installed in Finland's Helsinki area. Mobile commerce and mobile payment services are being adopted as essential tools to facilitate business transactions.

It is driven by the mobile phone, which has become a daily tool in individuals, groups, and businesses and has become a necessity for everyone in social, personal, and business life. Mobile devices now

greatly influence how people live (Alvi et al., 2016; Kim & Law, 2015). It is used for mobile commerce and mobile payments in the business world. It offers instant access to the Internet and has simple to use mobile payment apps to make the shopping experience more convenient.

Mobile commerce and mobile payment have taken business transactions from a simple traditional model to a larger scale with multifaceted individual, intra- and inter-firm cooperation (Coursaris & Hassanein, 2002; Kim & Law, 2015). Mobile commerce, also called m-commerce, includes any monetary transaction completed through a mobile device, such as a cell phone or tablet. Mobile commerce is an advancement of e-commerce that enables people to buy and sell goods or services from almost anywhere, simply through a mobile phone or tablet device (Buelligen & Woerter, 2004; Jayasingh & Eze, 2012). It has extended the products and services of electronic commerce to include the following: mobile money transfer, mobile ticketing, mobile vouchers, coupons and loyalty cards, and others. Mobile payment, also referred to as mobile money, mobile money transfer, and mobile wallet relates to payment services operated under financial regulation and performed from or via a mobile device. It is a situation where a customer uses a mobile phone instead of paying with cash, cheque, or credit cards to pay for a wide range of services and digital or hard goods. For instance, in Ghana, the benefits are mainly used to transfer value from one person to another person (P2P), for payment of goods and services such as buying airtime, paying for utility bills, Gold and DSTV bills, salaries of some workers, taxi fares, micro-credit, savings, and micro-insurance (Bank of Ghana, 2017).

Mobile commerce and mobile payment services have grown substantially. According to the GSMA's State of the Industry report on Mobile Money 2021, there was an increase in global registered accounts (by 12.7 percent globally to 1.21 billion accounts). Account activity grew at an even faster rate. The report stated that customers use their accounts more frequently. Still, they also used them for new and more advanced use cases, suggesting a movement from the margins of financial systems and leading increasingly digital lives. Global transaction values also grew to daily transactions exceeding \$2 billion and are expected to surpass \$3 billion a day by 2022 (GSMA, 2021).

This growth can be attributed to the rapid proliferation and improvement of mobile devices, which allow anytime-anywhere connectivity and use. Another critical factor is managerial support and enabling a regulatory environment that stimulates mobile commerce and mobile payment service use. It is especially true with regulators implementing more flexible processes and relaxing account opening requirements to make it easier to open an account (GSMA, 2021). However, these services have also experienced challenges, including the cost of access, low access securities, trust, and privacy (Karnouskos et al., 2004).

In Ghana, mobile commerce and mobile payments are gaining acceptance. The Bank of Ghana (BOG) Summary of Economic and Financial Data Report as of March 2021 showed an increase in all the indices from February 2020 to February 2021. Registered Mobile Money (MoMo) accounts increased from 32.7 million to 40.9 million, active MoMo accounts from 14.7 million to 17.5 million, the total number of transactions from 193 million to 295 million, the total value of transactions from GHS30.1 billion to GHS67.9 billion, MoMo interoperability complete transactions from GHS126.6 million to GHS990.7 million, and MoMo total number of transactions from 1.6 million to 6.2 million (Bank of Ghana, 2021). These figures indicate a high interest in mobile commerce and mobile payment services to businesses and customers.

The Bank of Ghana (2017) reports that mobile commerce and mobile payment bring several benefits to the user: convenience, speed, flexibility, and affordability. It also suggests a deepening of financial inclusion and progress towards a cash-lite economy.

Regarding the benefit to the economy, mobile commerce and mobile payment can contribute to Ghana's drive to become a cash-lite economy. Ghana has embarked on becoming a cash-lite society. For instance, the Bank of Ghana introduced several electronic payment methods, such as the e-ZWICH Card through the Ghana Interbank Payment and Settlement Systems (GhiPPS) and the Sika Card (mainly targeting farmers) through Social Security Bank (SSB), now Societe Générale in 1997

aimed at encouraging cashless transactions (Osei et al., 2021). Other initiatives by Ghana towards this effort include a digital address system, mobile money interoperability, paperless port, national ID system, smart driver licenses, e-business registration and certification, and digitisation of land records.

The concept of mobile commerce and mobile payment can enhance this drive towards a cash-lite society. Studies (e.g., Dias & McKee, 2010; Etim, 2012) found that more mobile money subscribers who do not have bank accounts in Africa now use mobile money for banking-related services than bank accounts.

However, mobile commerce and mobile payment adoption trends differ among countries due to mobile telecommunication infrastructure, range of mobile commerce and mobile payment services, mobile service providers' marketing strategies, and cultural influences of mobile commerce and mobile payment consumers (Dholakia & Kshetri, 2004). Therefore, it calls for the country and sector-specific research on the adoption of mobile commerce and mobile payments. In Ghana, not many comprehensive studies have been done on the adoption of mobile commerce and mobile payments by public servants. A public servant is a civil servant, a person employed in the public sector by a government department or agency for public sector undertakings. Civil servants work for central and state governments and answer to the government, not a political party (Organisation for Economic Co-operation and Development (OECD), 2005).

Hence, this research examines the factors influencing public servants' adoption of mobile commerce and mobile payments in Ghana.

The following sections are included in the manuscript: objective, research questions, literature review, research design and methodology, discussion, conclusions, implications, and limitations.

OBJECTIVE

The objective is to examine the factors influencing mobile commerce and mobile payments by public servants in Ghana. The study provides some understanding of the multiple facets of mobile commerce and mobile payments adoption, including its acceptance, use, and eventual adoption into the users' everyday life and how that affects their behaviour.

RESEARCH QUESTIONS

What factors will affect users' intention to adopt and use mobile commerce and mobile payment services?

What factors will affect users' intention towards choosing mobile commerce and mobile payments over other traditional e-commerce and payment service alternatives?

LITERATURE REVIEW

GLOBAL PERSPECTIVE OF MOBILE COMMERCE AND MOBILE PAYMENTS

Mobile technology has advanced substantially, propelling innovation (Ghazali et al., 2018). These advancements have increasingly transferred everyday inflexible physical activities to mobile-based virtual environments (Thakur & Srivastava, 2014). Given the flexibility of communication networks without the limits of location and time, mobile devices are widely used for various services, such as mobile payments, mobile commerce, and mobile social networking (O'Dea, 2020). Technology growth has also given rise to mobile commerce, extending e-commerce business activities conducted via wireless mobile devices. Global mobile commerce sales have tripled from USD1 trillion to USD3 trillion between 2016 and 2021 (Savvy, 2020). The evolution of mobile commerce has resulted in mobile shopping, which has substantially impacted enterprises and consumer convenience (Madan & Yadav, 2018; Saprikis et al., 2018). The most recent World Payments Report (WPR) asserts that global non-cash transaction is expected to reach 4.8 billion by 2025 (up from 2.8 billion in 2020), nearly

60% of the world's population. The fastest-growing mobile wallet markets include Southeast Asia, Latin America, Africa, and the Middle East (Capgemini, 2022). Emerging Asian markets, with a 32% growth rate, were the significant contributors to non-cash transaction volumes (Capgemini, 2019).

According to the WPR, COVID-19 accelerated customer adoption of digital wallets, mobile payments, and virtual/contactless cards as touch-free and convenient payments became the norm. Hence, digital prices are now globally ubiquitous, focusing on a feature-rich, hyper-personalised, end-to-end payment experience. It has made electronic and mobile commerce the mainstream and prime shopping preferences for customers, making digital solutions the preferred payment method. The report also asserts that its survey shows that 86% of customers are willing to share their financial data with non-banks, and 70% are happy if non-banks make payments on their behalf, with their permission.

Therefore, research interest in mobile commerce has increased around the globe in both developed and developing countries. For instance, recent studies on mobile commerce in the United States of America (Bailey et al., 2020; Cheong et al., 2019; Jung et al., 2020); India (Bhattacharya & Anand, 2021; Chopdar & Sivakumar, 2019; Liébana-Cabanillas et al., 2020); Indonesia (Dewi et al., 2020); Malaysia (Ghazali et al., 2018); developing countries (Madan & Yadav, 2018; Tarhini et al., 2019); and Vietnam (Phong et al., 2018).

TELECOMMUNICATION, MOBILE MONEY, AND FINANCIAL/ BANKING SECTOR IN GHANA

Mobile commerce and mobile payment in Ghana hinge on the vibrant ecosystem of the payment system. It began with the introduction of the telecommunication industry in Ghana. Before 1990, the telecommunication industry in Ghana was solely landlines and under the monopoly of the government's corporation: Ghana Post, Telephone, and Telegraph (PPT) (Nimako et al., 2010). However, by the close of 2000, Ghana's telecommunication industry had a strong internet and mobile telecommunication due to the deregulation of the sector in 1994 under the Accelerated Development Program (ADP) 1994-2000. Millicom Ghana Ltd, the operator of the Tigo cellular phone network, was the first mobile phone company to have started operation in Ghana in 1991. Ghana Telecom (GT), operators of the OneTouch phone network, was incorporated on June 16, 1995, to succeed the Ghana Post and Telecommunications Corporation (GPIC) as the incumbent provider of telecommunication services in Ghana and as the second mobile phone company. The following year, in October 1996, Scancom Ghana Ltd, operators of MTN, came onto the scene to be the third cellular phone network. In 1998, Kasapa Telecom Ltd, the Espresso mobile network operator, was established to become the fourth mobile company. In December 2008, Zain Ghana entered the Ghanaian telecommunication market with a 3.5G ultra-speed network technology. Two years later, in 2010, Bharti, operators of Airtel Ghana, acquired Zain. Finally, Globacom Limited, the Nigerian multinational telecommunication giant and operator of Glo Ghana, acquired its operating license in 2008 but started commercial operations in April of 2012 after several postponements of a commercial start date and a fine by the regulator delaying its launch.

Currently, of the six mobile operators providing mobile phone services in Ghana – Airtel, Kasapa, MTN, Tigo, Vodafone, and GLO – only four operate mobile money services: MTN, Tigo, Airtel, and Vodafone. Mobile money services have grown substantially in transaction value from GH¢171million in 2012 to the multi-billion-cedi sector in 2015. It has also enhanced and promoted mobile commerce and mobile payment in Ghana.

MTN launched mobile money in Ghana in July 2009 (GSMA, 2020). In March 2010, Airtel (then Zain) followed its own, and Tigo and Vodafone introduced theirs in October 2010 and July 2015. The mobile money service in Ghana, driven mainly by mobile operators, has proven to be a phenomenal transformer in its financial services industry in its relatively short stay (PwC, 2016). Mobile money is anticipated to be a tool for financial inclusion across the country and a vital delivery

channel to increase consumer banking. According to PwC (2016), there is a substantial level of awareness and trust demonstrated by participants (especially in the informal sector who are the more significant proportion of unbanked) in the mobile money industry implies that it will extend financial inclusion.

Literature on the mobile telephone sector has been significant in recent times; the bulk of these studies is on the penetration, adoption, and the uses to which people put their phones. Some of these include economic development (Aker & Mbiti, 2010; Lum, 2011; Ward & Zheng, 2016); financial inclusion (Donovan, 2012; Etim, 2014; Kpodar & Andrianaivo, 2011); education (Asongu & Nwachukwu, 2017; Porter et al., 2016); health (Opoku et al., 2017; Stephani et al., 2016); and mobile money and mobile banking (Asongu & Nwachukwu, 2016; Greenacre & Buckley, 2014; Macharia, 2013). To customers, three telecommunication service providers provide mobile Money services: cash management freedom, convenience, security, and ease of use in their various networks (Larkotey et al., 2013).

Mobile commerce and mobile payment in Ghana were boosted with the introduction of the Ghana Interbank Payment and Settlement Systems Limited's (GhIPSS) payment infrastructure for inter-bank transactions on which mobile money transactions within the same network and different networks (GhIPSS, 2007). GhIPSS was established in May 2007 to implement and manage financial institution payment structure interoperability. GhIPSS implemented and currently operates the National Biometric Smart Card Banking and Payment System (E-zwich), the Cheque Codeline Clearing (CCC) System, the Ghana Automated Clearing House (GACH) System, and the National Switching and Processing System per its mandate (gh-link). All Ghanaian banking institutions currently use the GhIPSS payment infrastructure, including ARB Apex Bank and its affiliates.

Currently, all banks in Ghana, including ARB Apex Bank and its affiliates, Savings and Loans Companies, and Third-Party Payment Providers, use the GhIPSS payment infrastructure for inter-bank transactions and mobile money transactions within the same network, and mobile money transactions across networks (GhIPSS, 2007).

However, little has been done about what factors influence mobile commerce and mobile payment services in the Ghanaian financial sector. This paper assesses what factors of this emerging phenomenon of mobile commerce and mobile payment influence how people interact with the business world. This way, the paper contributes to mobile commerce and mobile payment discourse by bringing into perspective the motivation behind people using mobile services.

The Ministry of Finance unveiled three policy measures in May 2020 to increase financial inclusion and hasten the transition to digital payments, including the National Financial Inclusion and Development Strategy (NFIDS), the Digital Financial Services Policy (DFS), and the Cash-Lite Roadmap (Government of Ghana, 2020). The government also established a new Digital Payments Coordination Unit to promote effective stakeholder participation and ineffective action execution. The new DFS policy would increase the efficacy of DFS measures. Ghana's new DFS strategy outlines a four-year roadmap for achieving short- and medium-term development in six areas: (a) improving DFS ecosystem governance; (b) Fintech support; (c) creating an enabling regulatory environment; (d) actively expanding authorities' capacity to regulate the field; and (e) supporting the development of DFS market infrastructure, and driving the expansion of digital payment use cases (Government of Ghana, n.d.). The plan was developed with expert assistance from the Consultative Group to Assist the Poor (CGAP) and the Swiss State Secretariat for Economic Affairs (SECO). Ghana's current biometric ID system and GhanaPost's GPS digital addressing system may be linked to enable remote account opening (Government of Ghana, n.d.).

Ghana launched its central bank digital currency (CBDC), the eCedi, in March 2021 (Hinge, 2021), to supplement and improve existing payment methods. The interoperability strategy embarked on earlier was to make existing electronic and mobile payment systems compatible with the eCedi to use it (PYMNTS, 2022). The objectives are to promote various digital payments while maintaining a safe

and robust payment infrastructure. These objectives are to be achieved through increasing digital service use and financial inclusion across all demographic categories.

Legislation to maintain public and user confidence and trust in the use of financial system digital goods includes issuing a comprehensive set of laws (rules, regulations, and guidelines) and policies. For example, the Bank of Ghana Act, 2002, Act 612, gives the BOG responsibility for the supervision of payment and settlement systems in Ghana, and the Payment Systems Act, 2003, Act 662, which offers the BOG additional authority to oversee, promote, manage, and supervise payment and settlement systems. Other legislation includes the Payment Systems Act of 2003, the Anti-Money Laundering Act of 2008, Act 749, and the Electronic Transactions Act of 2008, Act 772 (The Republic of Ghana, n.d.).

THEORETICAL BACKGROUND AND CONCEPTUAL FRAMEWORK

Researchers have widely used several theoretical frameworks to assess users' technology acceptance and continued use. The Technology Acceptance Model (TAM) is by far the most commonly used (Davis et al., 1989) and tested empirically from technological perspectives (Pai & Huang, 2011). Venkatesh et al. (2003) proposed the Unified Theory of Acceptance and Use of Technology (UTAUT) to unify eight other technology acceptance models. The initial model had four primary constructs: performance expectancy, social influence, effort expectancy, and facilitating conditions that influence behavioural intention to use a technology and usage behaviours. The model was later extended by including three new constructs. The first is hedonic motivation (intrinsic motivation), the second is price, and the third is a habit of getting the extended UTAUT (UTAUT2) (Venkatesh et al., 2012). The main objective of UTAUT2 is to emphasise the consumer technology use context in contrast to other general theories that focus on the prediction of behavioural intention to use a technology and technology use basically in organisational contexts (Venkatesh et al., 2012). UTAUT2 seeks to explain the user intention to use an information system and users' subsequent behaviour. The theory has its background in several other ideas, which have been combined to produce a complete model of user behaviour (Venkatesh et al., 2012).

Performance expectancy

Performance expectancy is defined by Venkatesh et al. (2003, p. 448) as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance." Performance expectancy, linked to utility, is the most significant predictor of behavioural intention (Venkatesh et al., 2003). This construct reveals users' utilitarian value for using the technology. It has been variously identified in other technology acceptance models as Perceived Usefulness (PU) in the Technology Acceptance Model (TAM) (Davis, 1989), Extrinsic Motivation in the Motivational Model (Davis et al., 1992), and Relative Advantage in the Innovation Diffusion Theory (IDT) (Rogers, 2010). The practical benefits of mobile commerce include online transactions with minimal charges. These benefits can increase users' motivation to continue using this service. Hence, this study proposes the following hypothesis:

Hypothesis 1: Performance expectancy positively influences a consumer's intention to use mobile commerce and mobile payment.

Effort expectancy

Effort expectancy is defined as "the degree of ease associated with consumers' use of technology" (Venkatesh et al., 2012). In other words, it is the degree of convenience associated with using consumer technology. The equivalents of the effort expectancy in other models include the Perceived Ease of Use (PEU) in TAM (Davis et al., 1989) and the Ease of Use in IDT (Rogers, 2010). Effort expectancy is shown to influence behavioural intention directly (Pahnila et al., 2011; Venkatesh et al., 2012; Zhou et al., 2010). Therefore, this study postulates the following hypothesis:

Hypothesis 2: Effort expectancy positively affects consumer behavioural intention to use mobile commerce.

Social influence

Social influence refers to how individuals perceive that others vital to them believe they should use technology. Social impact significantly affects a user's behavioural intention (Moore & Benbasat, 1991). Furthermore, Pankomera and van Greunen's (2019) research discovered that social influence is critical for developing countries' mobile commerce adoption. However, according to Kao and André L'Huillier (2022), the subjective norm has a significant negative effect on behavioural intention to adopt mobile commerce. This study investigates mobile commerce and mobile payments adoption by public servants using the UTAUT construct social influence. Mobile commerce is a convenient means for users to transact business and make payments. Hence, the following hypothesis is proposed:

Hypothesis 3: Social influence affects the behavioural intention of the consumer to use mobile commerce.

Price value (PV)

PV is the trade-off between the cost paid for using the technology and the perceived benefits received (Dodds et al., 1991). According to Venkatesh et al. (2012), price value is an essential factor influencing behavioural intention regarding technology use in consumer decision-making. The price value is based on the marketing construct of perceived value that predicts purchasing behaviour, which subsequently affects a company's competitive advantage (Chang & Tseng, 2013). The concept has been adopted to analyse users' adoption of emerging technologies or intelligent mobile devices. Previous research shows that the price value concept is crucial in attracting consumers (Zhao et al., 2012).

Hypothesis 4: Price value is positively associated with users' behavioural intention of using mobile money transfer technology.

Perceived reliability (PR)

Reliability is essential in selecting mobile commerce services because of lifetime threats in mobile commerce services. Reliability, a fundamental attribute of superior service quality (Gunawardhana & Perera, 2015), is characterised by Self Service Technology's (SST) perfect technical functioning to deliver the service accurately (Elliott et al., 2013). Nicolaou et al. (2013) found trust very important when exchanging electronic data. In addition to this, Skard & Nysveen (2016) stated that if customers perceived the systems as easy to use, they would perceive the systems as reliable and trustworthy. Hence, the following hypothesis was postulated:

Hypothesis 5: Perceived reliability is positively correlated to behavioural intentions.

Trust

Trust in mobile commerce is defined as "the extent to which an individual believes that using mobile commerce is secure and has no privacy threats" (Wei et al., 2009, p. 376). The extant literature has found that trust has gained increasing importance in mobile commerce studies and contributes to enhancing customer satisfaction, leading to consumer loyalty toward mobile commerce (Lu & Su, 2009; Misra & Wickamasinghe, 2004) and proposed as a critical factor in information systems studies (McKnight et al., 2002). Siau and Shen (2003) posit that mobile customers are often uncertain about mobile transactions' outcomes. It is often more critical when it comes to issues involving possible risks of financial loss due to online transactions and payments, perhaps due to the prevalence of reports of vulnerabilities and failures. Regarding the above, Lin et al. (2011) propose that a trust

component should be included in studying mobile commerce. Therefore, this study proposed the following hypothesis:

Hypothesis 6: Trust significantly influences behavioural intention to use mobile commerce.

Facilitating conditions

The facilitating conditions construct is described as the extent to which an individual believes that an organisation and a technical infrastructure are available to support the usage of a system (Venkatesh et al., 2003). Researchers conclude that facilitating conditions have a significant impact on innovative technology adoption and usage behaviours and are strong predictors for forecasting technology acceptances and usages (Hung et al., 2012; Lee et al., 2013; Pahlila et al., 2011). Therefore, we propose:

Hypothesis 7a: “Facilitating condition” positively influences “behavioural intention” of using mobile commerce.

Hypothesis 7b: “Facilitating condition” has a positive influence on “use behaviour” of using mobile commerce.

Behavioural intention

Behavioural intention has been defined as the individual’s willingness to use a technology system (Venkatesh et al., 2003; Venkatesh et al., 2012; Davis et al., 1989). This study adopts the definition offered by Venkatesh et al. (2012) that behavioural intention is the individual’s willingness to use and continue to use a technology system, where the individuals are the users of technology. The context is mobile money transfer technology. Intention to use a specific technology system is a strong predictor and determinant of the use of technology and predicts users’ later usage. The behavioural intention to use technology is a central concept of the technology acceptance models (Ajzen, 1991; Shepard et al., 1988; Taylor & Todd, 1995; Venkatesh et al., 2003). Therefore, the study proposes:

Hypothesis 8: “Behavioural intention” positively influences “use behaviour” of using mobile commerce services.

RESEARCH DESIGN AND METHODOLOGY

RESEARCH DESIGN

This study takes a purely quantitative approach. This approach was chosen because it entails an empirical investigation of the social phenomena of mobile commerce and mobile payments by public servants. As a result, it employs quantitative data collection methods such as surveys to collect and gather the information needed for the analysis. The research was conducted by surveying the factors influencing public servants’ adoption of mobile commerce and payments in Ghana. A cross-sectional survey was undertaken to put the research model to the test to measure the constructs and their relationships.

The model was measured and assessed using data computation in SmartPLS 3.2, guided by Partial Least Squares Structural Equation Modelling (PLS-SEM) procedures.

INSTRUMENTATION

The review of literature assists researchers in defining and analysing theories and concepts related to the theoretical research framework (Prasojo et al., 2020). Hence this study used a survey instrument based on established measures of constructs from mobile commerce literature. All the items used for the constructs of this study were adopted and modified from previous studies that were found to exhibit strong content validity.

The instrument is designed to meet the research objectives (Habibi et al., 2020) and to measure factors predicting e-commerce and e-payments (Davis, 1989; Gunasekaran et al., 2002; Venkatesh & Bala, 2008). The new instrument for the current study was developed based on the adaptation process; the indicators differed, designed to suit the study contexts, public servants, and e-commerce and e-payments in Ghana.

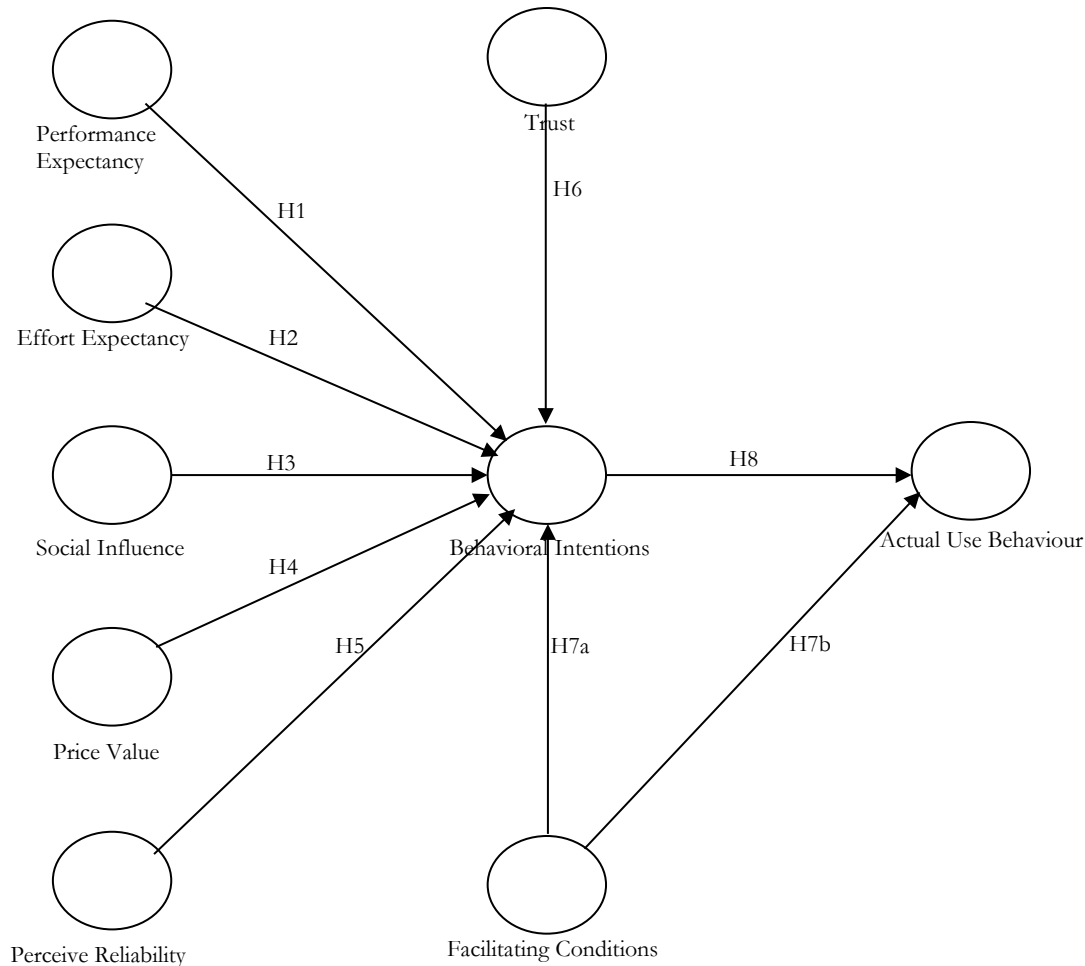


Figure 1. Conceptual model

The survey instrument gathered data on respondents’ demographics and the research constructs in the modified conceptual model; namely, performance expectancy, effort expectancy, social influence, facilitating conditions, trust, perceived reliability, price value, and behavioural intention. These model constructs are operationalised using existing measures developed, tested, and used in previous research studies. The constructs’ scale was adapted from studies based on TAM, UTAUT, and the Structural Equation Model (SEM) (Bhatti, 2007; Tuffour et al., 2018; L. Zhang et al., 2012). The construct items were assessed using a five-point Likert-type scale with anchors ranging from strongly disagree (1) to strongly agree (5) and three labelled as neutral.

The study identified 27 indicators that were adapted for the instrument. The indicators were then discussed with three educational technology experts from two universities in Ghana as part of the content validity process to tailor the instrument to the study’s context and set (Lynn, 1986). All 27 indicators were found to be appropriate for the context. The questionnaire based on the indicators was

piloted on 100 public servants in Accra to further assess the validity and reliability. The dataset was computed to evaluate Cronbach's alpha using SPSS 23 to report the initial reliability before the primary data collection. The measured reliability on the pre-tested questionnaire using Cronbach's alpha was between 0.73 and 0.84. Expert opinions on the pre-test analysis revealed strong face validity and reliability, resulting in the use of the questionnaire for this study.

All constructs had alpha values greater than 700 (Hair et al., 2019). Also, a Varimax rotation was performed to explain factors involved in the instrument using exploratory factor analysis procedures. The procedure included some measurement explorations, such as the Sphericity Bartlett Test, which should be at $p = 0.005$, and factor loading, which should be 0.500, Kaiser-Meyer-Olkin, which should be at >0.800 , and Communalities of 0.300 (Courtney & Gordon, 2013; Pallant, 2020). To comprehend the number of factors produced by the process, an eigenvalue of 1.00 was proposed. All the indicators meet the standardised measurement, resulting in 28 remaining for the primary data collection.

DATA COLLECTION

From March to May 2021, questionnaires were sent to a random sample of public servants. We chose a questionnaire because of the anonymity of the respondents and the low cost of the implication. The survey instrument was distributed via an online survey application. The questionnaire was distributed using Google Form, an application created by Google Inc. The data was gathered from social media platforms of public servants in three Ghanaian universities. After two months of data collection, all responses were entered into Microsoft Excel and transferred to the SmartPLS. G*power was used to determine the sample size, with eight path lines or hypotheses proposed in the study, and the sample size is set to be more than 200 respondents. G*Power is a free-to-use statistical analysis program used by social and behavioural researchers to provide established effect; it supports distribution and design-based input types (Faul et al., 2007).

POPULATION AND SAMPLING PROCEDURES

The population studied is the Civil Service of Ghana. A simple random sampling method was used (Altmann, 1974). Five hundred and seventy-four responses were obtained from Ghanaian public servants. After cleaning the responses, 550 were fully completed and ready for use. The questionnaire is divided into four sections: demographic factors, people, information, and network. The questionnaire is based on the [51] conceptual framework and employs a Likert scale ranging from 1 for strongly disagree to 5 for strongly agree. The study used descriptive analysis to determine the demographic and general characteristics of the respondents and provided a descriptive profile. For Partial Least Squares (PLS) analysis, the acceptable minimum sample size is at least ten times the number of most complex construct items (Gefen et al., 2000). Assuming that all of the constructs used in this survey are complex, multiply 10 by the 27 items in these constructs to get a sample size of 270. The number of elements to be included in the study is referred to as the sample size (Sekaran, 2006).

The sample was made up of 63.6% male and 36.4% female. The findings also show that 44.7% of respondents were between 51 and 60, with the lowest, 9.3%, falling into categories 18 to 30.

All respondents had formal education higher than or equal to Junior High School (JHS). On the respondents' education, holders of Higher National Diploma (HND) Degree represented the highest percentage with 48.2% of the 550 respondents. Ten percent of the respondents had post-graduate education, while 4.4% were holders of JHS/Senior High School (SHS)/Technical/Vocational Certificate. Holders of Diploma certificates represented 13.3%, while graduate certificate holders represented 10.2%. Finally, the demographic data revealed that within the public service in Ghana, professionals constitute the highest category representing 23.1%, while the elementary job category contributes only 5.1%. It is summarised in Table 1.

Table 1. Demography of respondents

Attribute	Categories	Percentages (%)	Frequency
Gender	Male	63.6	350
	Female	36.4	200
Age	18 - 30	9.3	51
	31 - 40	10.7	59
	41 - 50	18.5	102
	51 - 60	44.7	246
	60+	16.7	92
Education	JHS/SHS/Tech/Voc	4.4	24
	Diploma	13.3	73
	HND/Degree	48.2	265
	Professionals	24.0	132
	Masters	10.2	56
	PhD	0.0	0
Occupations	Managers, directors & senior officials	12.9	71
	Professionals	23.1	127
	Associate professional & technical	16.0	88
	Administrative & secretarial	10.0	55
	Skilled trades	8.9	49
	Caring, leisure & other services	11.1	61
	Sales & customer services	5.8	32
	Process, plant & machine operatives	7.1	39
	Elementary	5.1	28

RESULTS

MEASUREMENT MODEL

The measurement model refers to the procedures used to test the reliability and validity of the measures. There were three measurements considered, as suggested by Hair et al. (2019), including: (1) indicator loadings and internal consistency reliability, (2) convergent validity, and (3) discriminant validity.

Indicator loadings and the dependability of internal consistency

SmartPLS 3.3.3 was used to evaluate the measurement model using the PLS technique. Cronbach's alpha was used to assess the construct reliability. A test of composite reliability was used to evaluate the model's internal consistency. Table 2 shows that the Cronbach alpha (CA) and composite reliability (CR) values for all constructs exceeded the acceptable level of 0.7 as recommended by Fornell and Larcker (1981) and Ofori et al. (2018). The evaluation findings for statistical consistency across indicators are internal consistency reliability. Internal consistency reliability, according to Hair et al. (2019), should be reported using Cronbach's alpha (α) and Composite Reliability (CR). The values of α and CR in this study met the Hair et al. (2019) threshold where α should be >0.700 and CR should be >0.708 . All constructs have good internal consistency, with reliability ranging from 0.703 to 0.889 for the α and 0.830 to 0.923 for the CR.

Convergent validity

Convergent validity is a statistical problem related to construct validity. Convergent validity implies that assessments with similar or identical constructs should be highly correlated. The study used two standards to assess the model's convergent validity: (1) the extracted average variance (AVE), which should be >0.500 for each variable (Fornell & Larcker, 1981; Hair et al., 2006), and (2) the indicator factor loadings, which should also be >0.5 (Ofori et al., 2018). According to our calculations (Table 2), the AVE ranged from 0.634 to 0.732, above the acceptable level. According to Hair et al. (2011), convergent validity is appropriate whenever the AVE values exceed 0.500. Thus, our convergent validity is reasonable because our evaluated AVE values are greater than 0.500. For internal consistency reliability, the reliability coefficient (rho A) is normally between Cronbach's alpha is more conservative and gives the lower bound, and the composite reliability coefficient (rho-C) is the upper bound. Recommended ranges from 0.80 to 0.90. The majority of rho A values fall within the suggested range.

Table 2. Loadings of reliability and validity

Constructs	Items	Loadings	CA	rho_A	CR	AVE
Actual Use Behavioral	AU01	0.867	0.807	0.833	0.887	0.725
	AU02	0.931				
	AU03	0.745				
Behavioral Intention	BI01	0.877	0.794	0.804	0.879	0.707
	BI02	0.842				
	BI03	0.802				
Effort Expectancy	EE01	0.886	0.765	0.781	0.866	0.686
	EE02	0.880				
	EE03	0.706				
Facilitating Conditions	FC01	0.829	0.803	0.806	0.883	0.717
	FC02	0.873				
	FC03	0.837				
Performance Expectancy	PE01	0.770	0.718	0.734	0.842	0.642
	PE02	0.901				
	PE03	0.721				
Perceived Reliability	PR01	0.836	0.817	0.819	0.891	0.732
	PR02	0.871				
	PR03	0.859				
Price Value	PV01	0.877	0.814	0.741	0.868	0.689
	PV02	0.741				
	PV03	0.865				
Social Influence	SI01	0.785	0.754	0.763	0.859	0.67
	SI02	0.813				
	SI03	0.856				
Trust	TS01	0.742	0.72	0.764	0.838	0.634
	TS02	0.793				
	TS03	0.851				

Discriminant validity

According to Hair et al. (2019), discriminant validity is how a construct differs from other constructs. The researchers used the Fornell-Larcker criterion to report discriminant validity, stating that AVE for each latent construct should be greater than the construct's highest squared correlation with any other latent construct (Fornell & Larcker, 1981).

Furthermore, Chin (1998) suggests that the loading of each indicator should be greater than the sum of its cross-loadings. The discriminant validity emerges when a loading value on a construct is greater than the sum of all of its cross-loading values on the other constructs.

Table 3 shows that all indicators' values of the outer loading on each construct were more significant than the values of all their cross-loadings on the other constructs. As a result of the cross-loading value examination, discriminant validity was discovered. The discriminant validity was assessed using the Henseler et al. (2016) Heterotrait-Monotrait ratio of correlation (HTMT) criterion, as shown in Table 4. When HTMT values are more significant than 0.900, discriminant validity issues arise. If HTMT is more significant than 0.900, the construct is similar but lacks discriminant validity. Table 4 showed that all HTMT values were less than 0.900. The results show that the values differed significantly from 1.

Table 3. Discriminant validity using Fornell–Larcker criterion

	Actual Use Behavioural	Behavioural Intention	Effort Expectancy	Facilitating Conditions	Perceived Reliability	Performance Expectancy	Price Value	Social Influence	Trust
Actual Use Behavioural	0.851								
Behavioural Intention	0.645	0.841							
Effort Expectancy	0.339	0.364	0.828						
Facilitating Conditions	0.662	0.748	0.413	0.846					
Perceived Reliability	0.673	0.735	0.419	0.974	0.855				
Performance Expectancy	0.306	0.522	0.521	0.322	0.27	0.801			
Price Value	0.215	0.1	0.454	0.066	0.071	0.208	0.83		
Social Influence	0.013	0.197	0.064	0.029	0.032	0.381	0.019	0.818	
Trust	0.626	0.845	0.288	0.765	0.781	0.291	0.075	0.303	0.797

Table 4. Heterotrait-Monotrait ratio (HTMT)

	Actual Use Behavioural	Behavioural Intention	Effort Expectancy	Facilitating Conditions	Perceived Reliability	Performance Expectancy	Price Value	Social Influence	Trust
Actual Use Behavioural									
Behavioural Intention	0.785								
Effort Expectancy	0.42	0.462							
Facilitating Conditions	0.817	0.931	0.502						
Perceived Reliability	0.823	0.906	0.508	1.206					
Performance Expectancy	0.396	0.682	0.659	0.414	0.352				
Price Value	0.234	0.147	0.599	0.134	0.123	0.243			
Social Influence	0.169	0.259	0.152	0.134	0.144	0.517	0.116		
Trust	0.785	1.068	0.354	1.01	1.019	0.424	0.11	0.463	

ASSESSMENT OF STRUCTURAL MODEL

This section evaluates the overall explanatory power, the amount of variance explained by the independent variables, and the degree of strength of each path. We used the bootstrap method to estimate the path significance. We also use the coefficient of determination (R^2), and the standardised root means square residual (SRMR) to evaluate the structural model's quality (Hair et al., 2019; Henseler et al., 2014). The results of our structural model are shown in Figure 1 and Table 5. Trust shows the strongest relationship and significantly predicts actual use behaviour, H6 ($\beta = 0.727$; $t = 19.277$; $p = 0.000$). It is followed by performance expectancy's role in predicting behavioural intention, H1 ($\beta = 0.374$; $t = 11.710$; $p = 0.000$). Facilitating conditions is important and has a positive and significant influence on actual use behaviour H7a ($\beta = 0.407$; $t = 8.456$; $p = 0.000$).

The results also show that H8 behavioural intentions positively influence predicting actual user behaviour in mobile commerce and mobile payments. While social influence has a negative impact on predicting behavioural intention plays a significant role in influencing the choice to use mobile commerce and mobile payment, H3 ($\beta = -0.164$; $t = 5.786$; $p = 0.000$). Further, it is noted that effort expectancy, H2 ($\beta = -0.070$; $t = 2.440$; $p = 0.015$), while having a negative influence in predicting behavioural intention, still has a slightly significant role in predicting intentions to use mobile commerce and mobile payments. The effect of facilitating conditions on behavioural intention (H7a), on the other hand, has no negative relationship and plays no significant role in predicting the use of mobile commerce and mobile payments among public servants ($\beta = 0.143$; $t = 1.672$; $p = 0.095$). Our findings indicate that H4 and H5, price value and perceived reliability respectively, have negative relationships and do not play any role in predicting behavioural intentions in the use of mobile commerce and mobile payments.

As a result, as shown in Table 5, we did not find support for H7b, H4, and H5 in this study. Henseler et al. (2015) assert that the predictive validity of variance is a measure for determining the validity of a model prediction with precision. As a result, the coefficient of determination (R^2) is the regression value's output as a variance proportion in the exogenous variable projected by the endogenous variable. R^2 values range from 0 to 1; a higher value indicates a higher level of R^2 . R^2 of 0.75 is considered substantial, 0.50 is moderate, and 0.25 is considered weak (Hair et al., 2019; Shmueli et al., 2019). This study shows Actual Use Behaviour (0.489, Moderate) and Behavioural Intention (0.830, Significant) values. Finally, the R^2 indicates a sufficient level of R^2 (see Table 5 and Figure 2).

Table 5. Path coefficients and their significance

Hypothesis	β	t	P values	Results	
H1	Performance Expectancy -> Behavioural Intention	0.374	11.710	0.000	YES
H2	Effort Expectancy -> Behavioural Intention	-0.070	2.440	0.015	YES
H3	Social Influence -> Behavioural Intention	-0.164	5.786	0.000	YES
H4	Price Value -> Behavioural Intention	-0.003	0.206	0.837	NO
H5	Perceived Reliability -> Behavioural Intention	-0.038	0.386	0.700	NO
H6	Trust -> Behavioural Intention	0.727	19.277	0.000	YES
H7a	Facilitating Conditions -> Actual Use Behaviour	0.407	8.456	0.000	YES
H7b	Facilitating Conditions -> Behavioural Intention	0.143	1.672	0.095	NO
H8	Behavioural Intention -> Actual Use Behaviour	0.341	6.455	0.000	YES
	R^2				
	Actual Use Behaviour	0.489			
	Behavioural Intention	0.830			

DISCUSSION

To investigate the factors that predict the use of mobile commerce and mobile payment, a version of extended UTAUT was used in this study. This study added two trust-based constructs (Perceived Reliability and Trust) to the UTAUT model's core determinants and another resource-based construct (price value). It was successfully used to explain the process of mobile commerce and mobile payment as perceived by Ghanaian public servants. The model can be examined and adopted by other researchers in the future who are interested in researching technology integration based on the findings. The instrument contributes significantly to advancing academic techniques for structural equation research. The model is valid and reliable based on content validity and measurement. Previous studies tested their scale using similar measures (Mohammadi, 2015; Muhaimin et al., 2019; Ramirez-Correa et al., 2015). The UTAUT model is superior to other competing models (Venkatesh et al., 2003), but little UTAUT-based research is available, especially when compared to massive TAM/TPB-based research.

Trust and performance expectancy are among the factors that most influence behavioural intention in this study H6 ($\beta = 0.727, p 0.000$) and H1 ($\beta = 0.374, p 0.000$). Hence, hypothesis H6 and H1 are among the best predictors of behavioural intention to use mobile commerce and mobile payment.

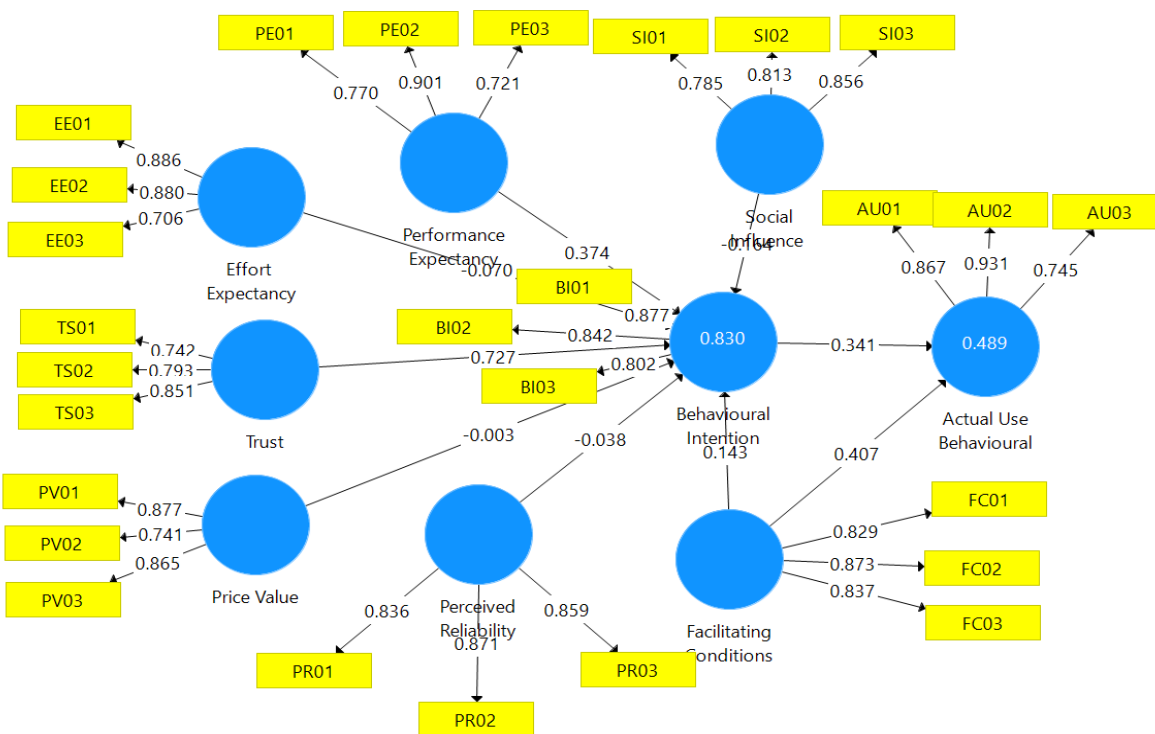


Figure 2. Results of structural model

It implies that the more people find mobile commerce and mobile payments beneficial because they increase productivity in performing commercial activities, including payment for goods and services, the more likely they are to engage them. This finding is consistent with the results of Alkhunaizan and Love (2012), Zarpou et al. (2012), and also of Davis et al. (1989), whose goal was to identify the most important factors influencing people's intentions to use technology. Their work concluded that the performance expectancy of technology is the most vital determinant of people's preferences to use technology. However, the study contradicts studies conducted by Bhatti (2007) and L. Zhang et al. (2012), which failed to demonstrate significance.

H2, Effort Expectancy, is discovered to influence behavioural intentions negatively, still is statistically significant to behavioural intention to use mobile commerce and mobile payment ($\beta = -0.070$; $p = 0.015$). It implies that Effort Expectancy influences public servants' decision to adopt and use mobile commerce and mobile payment. It is proof that the more public servants believe mobile commerce and mobile payment is simple, the better they behave toward Actual use. This finding is consistent with previous research on technology adoption (Blaise et al., 2018; Buabeng-Andoh et al., 2019). However, it should be noted that the results of this study contradicted the findings of Wei et al. (2009). They discovered no significant relationship between the effort expectancy of use of mobile commerce and intention to use mobile commerce. It also implies that public servants think mobile commerce and mobile payment are simple and engage mobile commerce services in their daily transactions. Based on the findings of this study, the features and functions of various mobile devices and software applications of mobile commerce and mobile payments should be made more intuitive to public servants to encourage them to use the services for their daily activities.

According to the findings of this study, social influence, H3, even though it has a negative effect on public servants' behavioural intentions to adopt mobile commerce and mobile payment, still plays a significant role in influencing behavioural intention to use mobile commerce and mobile payments ($\beta = -0.164$; $p = 0.000$). Surprisingly, prior research has identified Social Influence as a critical and influential indicator of technology adoption. Chou et al. (2018) conducted a study to identify the factors that significantly affect mobile commerce adoption intentions in Taiwan. Social Influence was one of the factors that had a significant relationship with behavioural intention to adopt mobile commerce. According to this study's findings, social ties may not influence public servants' decisions to use or not use mobile commerce and mobile payment. Furthermore, mobile commerce adoption is low in developing countries, so most public servants may not consider the use of mobile commerce. Thus, the users will not be able to be significantly influenced by them.

Price Value has been shown to have a more significant impact on behavioral intention to use mobile commerce and mobile payment. It is consistent with Venkatesh et al. (2012) and Alkhunaizan and Love (2012). Wei et al. (2009) also contend that cost is one of the primary barriers to mobile commerce adoption in Malaysia, which is also the case in Ghana. Price value in this research work means a person's perception of the gains to be derived in adopting mobile commerce and the financial commitment borne by the person (Dodds et al., 1991; Venkatesh et al., 2012). When a person anticipates that the gains are more than the financial commitments of using technology, the price value is positive or negative. This contrast implies that exorbitant prices would have a negative impact on a person's willingness to accept mobile commerce services. The findings of this study showed price value, H4, negatively influences and is not significant in predicting behavioural intention to use mobile commerce and mobile payment ($\beta = -0.003$; $t = 0.206$; $p = 0.837$). This finding contrasts with Iskandar et al. (2020), who found price value negative yet significant in explaining behaviour intention.

The extant literature identified perceived reliability as one of the significant factors influencing behavioural intention to use mobile commerce and mobile payments (Li et al., 2010; Sadi & Noorudin, 2009). Surprisingly, while prior research has identified Perceived Reliability as essential and a clear critical indicator of technology adoption, this study's findings reveal that perceived reliability negatively influences behavioural intention. It is not significant in predicting public servants' decisions to use mobile commerce ($\beta = -0.038$, $p = 0.700$) (H5). It may be so because mobile commerce and mobile payment are still in their early stages in most developing countries; particularly in Ghana, one primary concern is its dependability within inadequate existing social and technical infrastructure and facilities. Hence, public servants may not consider it essential and thus will not be significantly influenced by them. In other words, public servants may view the quality of the product and service and the security of their personal information and financial transactions. It was expected that the potential risks of economic systems designed for payment transactions, high level of mobile money fraud, and even unsustainable policies all create warrants and uncertainties for perceived reliability to be a strong influencer of mobile commerce adoption.

According to the study's findings, trust is a significant factor in Ghanaians' acceptance of mobile commerce. From the data analysis, when people want a high level of security and privacy, they should consider trust. The findings are consistent with Alkhunaizan and Love (2012), who believe that trust is critical in technology adoption. Chong et al. (2012) discovered that trust was a significant factor influencing the intention to adopt mobile commerce in their mobile commerce acceptance in China, contributing to the TAM framework. Furthermore, according to Laudon and Traver (2016), most developing countries take far less risk than developed countries. Mobile commerce is not a well-developed technology among Ghanaian public servants, implying that more effort is needed to pique their interest in adopting the technology.

According to Qingfei et al. (2008), user acceptance includes both acceptance of technology and acceptance of m-commerce services. Siau and Shen (2003) define trust as "trust of a technology" and "trust of m-commerce service providers." Furthermore, because m-commerce is not widely used in developing countries, systems should be implemented to increase traders' confidence in using m-commerce.

Facilitating conditions represent a person's belief that having technical knowledge and resources will help them use mobile commerce and mobile payments (Venkatesh et al., 2003). A growing number of studies suggest that Facilitating Conditions play an essential role in actual technology usage behaviour (Venkatesh et al., 2003). This study confirms the analysis mentioned above in mobile commerce and mobile payment adoption by Ghanaian public servants. The statistical analysis of Hypothesis H7a revealed a significant positive result ($\beta = 0.407$, $p = 0.000$), indicating that respondents have an Actual Use Behaviour to use mobile commerce services, assuming they meet the necessary facilitating conditions. This study done in Ghana is consistent with the findings of Kwofie and Adjei (2019). They analysed factors influencing mobile commerce and mobile payment of 215 traders in Ghana and discovered that facilitating conditions significantly impact behavioural forecasting intention. Escobar-Rodríguez and Carvajal-Trujillo (2014) reported similar findings. However, Alkhunaizan and Love (2012), who examined factors affecting the acceptance of mobile commerce within the context of Saudi Arabia based on the revised UTAUT model, found that facilitating conditions had no significant influence on actual use. While enabling conditions significantly supported actual user behaviour in this study, surprisingly, the facilitating conditions of H7b are ineffective in influencing behavioural intention in the current analyses ($\beta = 0.143$, $p = 0.095$). It indicates that promoting conditions are insignificant and did not influence behavioural intention to use e-commerce services. The findings contrast Azam et al.'s (2021) findings, who investigated electronic commerce use in Bangladesh and concluded that facilitating conditions positively influence behavioural intention and actual use of electronic commerce.

Finally, intention to use was found to be significant in predicting actual use behaviour ($\beta = 0.341$, $p = 0.000$), which is supported by findings from Asampana et al. (2022), Ramírez-Correa et al. (2015) and S. Zhang et al. (2008).

IMPLICATIONS

The findings of this study have several implications for both researchers and the mobile commerce and mobile payment industry. The empirical results show that incorporating trust, perceived reliability, and price value into the UTAUT in the mobile commerce and mobile payment context would be a worthwhile extension of the UTAUT, as trust was influential in predicting attitude and behaviour. The trust-based constructs – perceived reliability and trust – did not influence behavioural intention to use mobile commerce and mobile payment.

The basic UTAUT model describes people's attitudes toward and use of technology by looking at four constructs: performance expectancy (perceived usefulness), effort expectancy (perceived ease of use), facilitating conditions (resources and knowledge), and social influences (subjective norm) (Venkatesh et al., 2012).

Even though there are numerous studies in the mobile commerce literature, few have used integrated models of perceived reliability, trust, and price value or methods to evaluate these factors in the emerging mobile commerce industry. While the current study results on the trust-based factors of perceived reliability and trust returned negative and showed no impact on behavioural intention to use mobile commerce and mobile payment, it still contributes to the literature on their effects. The findings of this study indicated that trust has a significant impact on users' intentions. Behavioural intention is a person's underlying attitude, ultimately determining behavioural intentions via attitude (Ajzen, 1991). Thus, this study adds to the body of knowledge on UTAUT research by confirming that perceived trust, as a critical belief, can influence actual usage of mobile commerce via behavioural intention.

It implies that public servants believe that mobile commerce is secure with no privacy threats. Hence, mobile commerce and mobile payment industry stakeholders can leverage this knowledge to encourage mobile commerce services.

Mobile applications are attractive to people because they provide a better user experience. These mobile applications have been optimised to provide a fast, easy and delightful experience resulting in more sales and leads. Hence, mobile commerce and mobile payment stakeholders need to pay close attention to strategically enhancing technology and customer-centred factors that influence the adoption of mobile commerce innovations. Mobile commerce and mobile payment service providers can attract and retain more users if attention is paid to performance expectancy, trust, and facilitating conditions since they influence individuals' decisions to adopt.

Mobile technology is almost ubiquitous, influencing both online sales and in-store sales. Mobile devices are the primary means that most customers use to look up information about products they see in stores, such as product reviews, pricing options, and whether neighbouring stores have certain items in stock. With the right mobile commerce platform and features, businesses can expect to increase in-store and online sales, catering to a more extensive clientele. As a result, mobile commerce service providers must create strategies to attract and retain mobile commerce customers. This study indicates that mobile commerce service providers can achieve a more extensive clientele base when they promote performance expectancy, trust, and behavioural intentions, which significantly positively affect mobile commerce service usage.

Finally, with the fluidity of the mobile environment, this study offers insights into mobile commerce behaviours with implications that spell out effective mobile commerce services that will continue to be relevant. With the emergence and acceptance of mobile commerce as a new mode of transaction with firms providing enabling platforms for users, mobile commerce could become the most acceptable application for the next generation of mobile platform applications.

CONCLUSION AND LIMITATIONS

This study is summarised as follows:

First, behavioural intention is significantly positively influenced by the variables of performance expectancy, trust, and facilitating conditions. The effort expectancy and social influence factors have a significant negative effect.

Secondly, latent variables price value and perceived reliability do not affect behavioural intention.

Finally, the actual use behaviour of mobile commerce and mobile payment users is significantly positively influenced by behavioural intention and facilitating conditions.

The above implies that performance expectancy, trust, and facilitating conditions are essential factors influencing Ghanaian public servants' intention to use mobile commerce. However, effort expectancy and social influence were found to have a negative impact but significant in determining behavioural intention and actual use behaviour. Hence, mobile commerce and mobile payment businesses

should focus more on developing more products and services that provide ease of productivity, trust and security, and better infrastructure and enabling facilities. Future research could further test the adapted model with moderating factors of age, gender, and education to delve deeper into the complexities of mobile commerce and mobile payments. While some particular mobile commerce and payment instruments aimed primarily at farmers (the Sika Card) were discussed previously, this study was confined to Ghanaian public officials. It did not include other sector workers, including farmers. Furthermore, the sampling was restricted to a particular geographical area. Because of this constraint, certain conclusions may be skewed.

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