

## Investigating the Impact of Technology Acceptance on Mobile Commerce (M-Commerce) Adoption

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### Abstract

*This study delves into the relationship between technology acceptance and the adoption of mobile commerce (m-commerce) among small, medium, and micro-enterprises (SMMEs) in Polokwane Municipality. The study used a quantitative research methodology, and n=146 SMME owners were randomly chosen from a population of 261 owners to participate as respondents. A comprehensive analysis of the existing empirical literature served as the basis for the questionnaire that served as the study instrument. The study examined technology acceptance constructs to determine the elements that influence the adoption of m-commerce. To make the data set more suitable for further study, strict data cleaning methods were put in place. The application of normality tests, the determination of the mean and standard deviation as indicators of central tendency and variability, and the evaluation of skewness and kurtosis were all part of this process. According to the results, the data was suitable for the intended purpose of the study. The acquired data was also thoroughly examined for validity and reliability, and the results met the standards for both areas. The study aims to add to the body of knowledge on the complex interactions between m-commerce adoption among SMMEs and technology acceptance criteria, particularly within the context of the Polokwane Municipality. Descriptive statistics, ANOVA, and regression analysis methods were used in the data analysis. ANOVA was used to assess the sub-hypotheses and to determine whether the stated hypotheses should be accepted or rejected based on significance levels. The regression analysis was used to test the main hypotheses. The ANOVA results showed that the technology acceptance constructs significantly predicted m-commerce adoption. These constructs include perceived usefulness and perceived ease of use, both of which showed significant predictive power regarding the adoption of m-commerce. Importantly, the general hypothesis (H1) which proposed that the factors of the technology acceptance model collectively influence the adoption of m-commerce and was rejected, indicating that the combined effect of these factors is not statistically significant. Given their significant influence on adoption patterns, the resulting insights suggest that SMMEs should improve their management of determinants connected with m-commerce. Additionally, the government involvement is crucial in strengthening the SMME sector, as it can make it easier for the integration of m-commerce by introducing policies that build a supportive business climate.*

**Keywords:** Adoption; Digital Entrepreneurship; Mobile Commerce; SMME; TAM

### 1. Introduction and Background

Received:12 October 2025 Accepted:28 March 2026 Published:2<sup>nd</sup> September 2026

The Polokwane Local Municipality (PLM), with a land area of about 3 766 km<sup>2</sup>, comprises only about 3% of the total area of the province, but its population of about 628 999 people represents more than 10% of the total population of the province, making it the Capricorn district's most densely populated area (Statistics South Africa, 2010). Sepedi speakers make up most of the population of the PLM (78.7%), which is made up of people from a variety of ethnic backgrounds. Other ethnic groups include Afrikaans (5.3%), English (3.1%), Xitsonga (2.8%), and Tshivenda (2.1%). Notably, the population of the municipality grows by 2.13% per year, and there is a 32.40% unemployment rate, which is a large number given the covered area of the municipality of about 178 001 households (Statistics South Africa, 2010). According to the 2013 Limpopo Conservation Plan, the PLM is in (a) South Africa and (b) more specifically, in the Capricorn district. Figure 1 shows the location of the PLM inside the vast Limpopo region of South Africa at coordinates 23°54'00" S, 29°27'00" E. The province has borders with Mozambique, Zimbabwe, Botswana, as well as South African provinces, including Mpumalanga, Gauteng, and the North West Province. It is approximately 125 754 km<sup>2</sup> in size. This advantageous geographical setting promotes interactions between members of the local community and those from nearby provinces and nations, creating a fusion of various botanical knowledge and therapeutic procedures. All five districts of the province of Limpopo border the PLM, which is tucked away within the Capricorn district (as depicted in Figure 1).

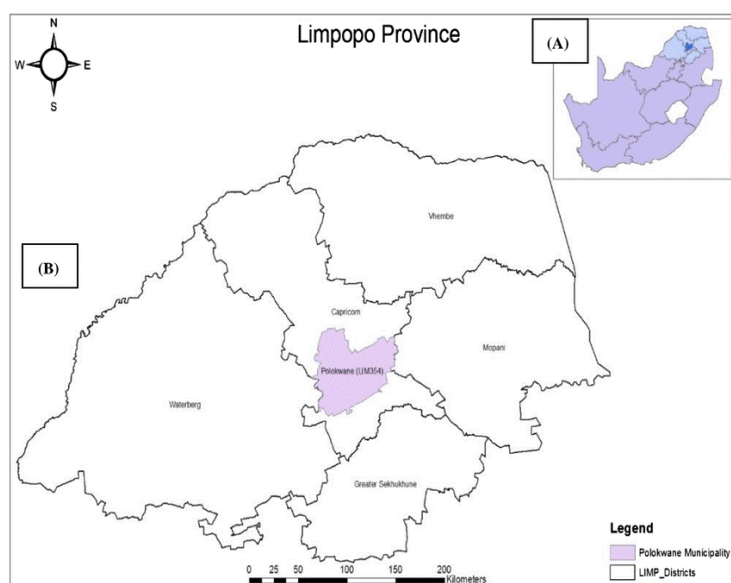


Figure 1: Map of Limpopo provincial municipalities. Source: Limpopo Conservation Plan 2013

## 2. Problem Statement

The Polokwane Local Municipality (PLM), allocated within the Capricorn District of Limpopo Province, is the most densely populated area in the district, housing over 628,999 people within a land area of approximately 3,766 km<sup>2</sup>. Despite its strategic geographical location and cultural diversity, PLM faces significant socio-economic challenges, including a high unemployment rate of 32.40% and a population growth rate of 2.13% annually. These factors place increasing pressure on local resources and economic development initiatives. While the advantageous position of the municipality fosters interaction with neighbouring provinces and countries, creating opportunities for economic integration and knowledge exchange, persistent unemployment and limited economic diversification hinder sustainable development.

Addressing these challenges requires innovative strategies that leverage local strengths and external linkages to stimulate economic growth and improve livelihoods.

### **3. Overview of Small, Medium and Micro-Enterprises in South Africa**

Small, medium, and micro-enterprises (SMMEs) play a crucial role in the economy of South Africa, contributing significantly to employment, innovation, and GDP growth. SMMEs constitute approximately 98% of businesses in South Africa, employing between 50 and 60% of the workforce and contributing around 34% to GDP (Ngo Ndjama *et al.*, 2024).

#### **3.1. Definition and Classification**

The National Small Business Amendment Act (2004) classifies SMMEs into micro-, very small, small, and medium enterprises based on the number of employees and annual turnover. Micro-enterprises typically employ fewer than five people, while medium-sized enterprises employ up to 200 workers, with sector-specific turnover thresholds (Peters *et al.*, 2013).

#### **3.2. Contribution to Economic Growth**

SMMEs are instrumental in fostering economic inclusion and reducing unemployment. They account for nearly 40% of the GDP of South Africa and employ approximately 47% of the working population (Bruwer, 2019). Despite their economic significance, these enterprises face persistent challenges, including access to finance, regulatory compliance, and limited market reach (Sithole *et al.*, 2021).

#### **3.3. Challenges and Opportunities**

One of the key challenges facing SMMEs is financial constraints, as many struggle to secure funding from formal financial institutions. Additionally, high operational costs and complex regulatory requirements hinder their sustainability (Ngo Ndjama *et al.*, 2024). However, advancements in digital technology, particularly cloud computing and e-commerce, present opportunities for SMME growth and scalability (Sithole *et al.*, 2021).

#### **3.4 Evolution of Technology**

Since 1966, the trajectory of technology history has undergone a series of revolutionary changes that have solidified the field as an acceptable subject of study for historians in general. In the last 25 years, researchers in the field of technical history have combined elements from sociology, anthropology, economics, cultural history, the history of science, business history, sociology, and philosophy of science (Basalla, 1992). In addition, technology development significantly enhances the competitive edge of both nations and businesses (Porter, 1997; Freeman, 1996; Vespignani, 2009; Roepke *et al.*, 2014; Coccia, 2017, 2019a, 2019b, 2019c, 2019d, 2019e; 2020a, 2020b; Messeni Petruzzelli *et al.*, 2011). A variety of technologies, including distributed technology centred on cloud infrastructure, artificial intelligence (AI)-driven computing, blockchain, and improved 5th generation networks, have the potential to aid in efforts to monitor pandemics, track viruses, implement preventive measures, manage treatments, and allocate resources during such crises on a global scale. While several options might be investigated, information

technologies (IT) are essential for successfully handling the difficulties brought on by Covid-19 (Satish *et al.*, 2020).

### **3.5 Digital Entrepreneurship**

Sahut, Iandoli and Teulon (2021) define digital entrepreneurship as the process of entrepreneurial creation of digital value using various socio-technical digital enablers to support effective acquisition, processing, distribution, and consumption of digital information. Digital entrepreneurship is further defined as the platforms, infrastructures, or things that employ computing power on universal public networks known as digital technologies and the intersection of digital technologies and entrepreneurship (Bejjani, *et al.*, 2023; Nambisan, 2017). Therefore, digital entrepreneurship is defined in this paper as a subsection of entrepreneurship that involves the transformation of physical products to digital products using technology and artificial intelligence.

Digital entrepreneurship is regarded as a basis for generating jobs, innovation and economic growth in South Africa. Digital entrepreneurship is a marvel that results from the technological use of information and communication technology and the internet (Nambisan, 2017). The world is witnessing continuous and radical innovations by entrepreneurs that take advantage of the power of technology to provide newly developed products and services through mobile commerce with ease. The use of technology influences businesses by introducing a new range of options with considerable business values, the digital economy can, therefore, lower the cost for new business creation (Chen *et al.*, 2023). Digital technologies are redesigning and restructuring business and the economy by creating more jobs and access to more products in South African markets.

## **4. Research Question**

The main research question was:

What is the impact of technology acceptance factors on the adoption of mobile commerce (m-commerce) among Small, Medium, and Micro Enterprises (SMMEs)?

## **5. Hypothesis**

*H1: Technology acceptance model factors positively influence m-commerce adoption among SMMEs.*

*H<sub>a1</sub>: Perceived ease of use positively predicts m-commerce adoption among SMMEs.*

*H<sub>a2</sub>: Perceived usefulness positively predicts m-commerce adoption among SMMEs.*

## **6. Theoretical Framework**

The entrepreneurial theory and the concept of perceived usefulness and perceived ease of use are of particular significance in the context of this paper. The entrepreneurial paradigm places a strong emphasis on how innovation and a willingness to take risks influence adoption and decision-making in SMMEs. This hypothesis contends that because they are driven by the possible rewards and competitive advantages that such innovations might provide, entrepreneurs are more likely to adopt new technologies, such as m-commerce. TAM on the other hand, argues that people are more inclined to adopt new technologies if they believe that they will be valuable as well as convenient and simple to use. This theory stresses the

importance of how SMME owners and stakeholders see the practical benefit of m-commerce for their business operations and how user-friendly the technology is. It is particularly pertinent to understanding the adoption of m-commerce among SMMEs. Both theories offer valuable information on the factors that can affect the adoption of m-commerce SMMEs. The purpose of this study is to shed light on the dynamics that support or restrict the integration of m-commerce within the framework of small and medium-sized enterprises by examining these ideas.

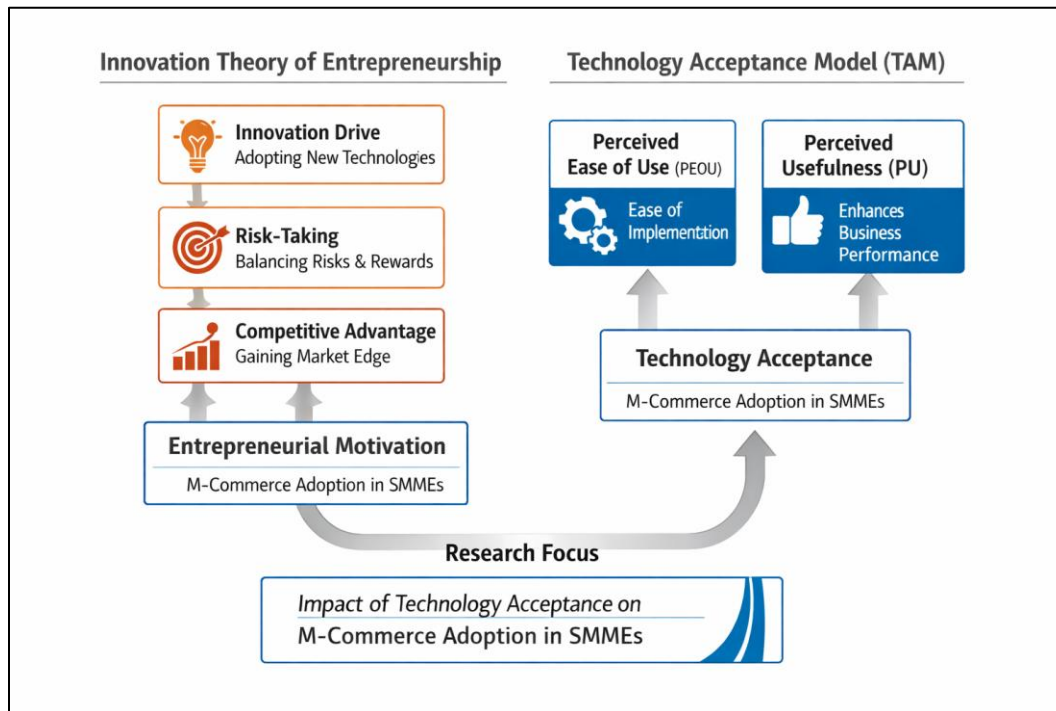


**Figure 2: Clear diagrammatic alignment of the two theories with the main research question and hypotheses**

## 6.1. Innovation Theory of Entrepreneurship

In Figure 2, the alignment of TAM and ITE with the main research question and hypotheses of this study are illustrated. It is important to note that the study of entrepreneurship and SMMEs was once the primary focus of entrepreneurship. Insights from multiple fields are now incorporated, and new theories are developed that address entrepreneurial behaviour within large, well-established businesses (Kraus *et al.*, 2010; Aldrich, 2012, Frank *et al.*, 2016; Ferreira, 2019). Within academic fields, including strategic management, economics, and social psychology, this trend has drawn more attention. A special edition of the *Strategic Entrepreneurship Journal* with seven chosen papers was organised by Alvarez *et al.*, (2016). The selection of these articles was made with the intention of inciting deliberative debates that directly engage with the development of entrepreneurial theories or concepts and have implications for their growth. According to the authors, these articles demonstrate the commitment of the entrepreneurship community to the creation of thorough theoretical frameworks.

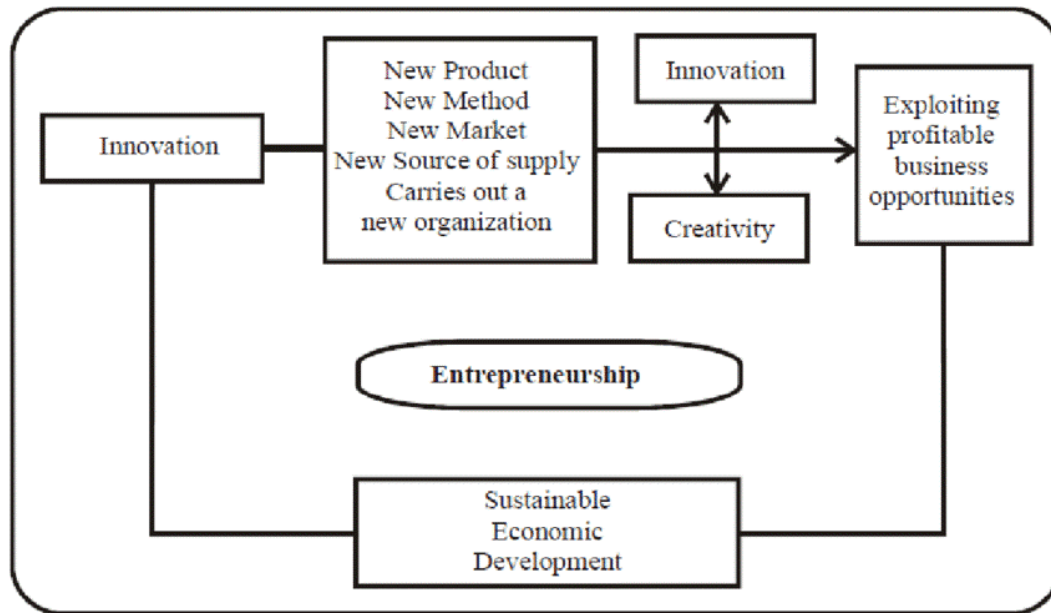


**Figure 3: Innovation theory of entrepreneurship. Source: Schumpeter (1949)**

Recent studies confirm that innovation-driven behavior is a key factor in m-commerce adoption (Figure 3) in that:

- Kabir (2026) found that digital networking and innovation strategies significantly enhance business sustainability for foreign entrepreneurs in Poland, reinforcing the view of Schumpeter that innovation and risk-taking drive technology adoption.
- Dadhich *et al.*, (2026) used SEM–ANN analysis to show that entrepreneurial education and innovation readiness are strong enablers of sustainable entrepreneurship.
- Indiani *et al.*, (2025) developed an integrative framework combining innovation resistance theory and UTAUT, showing that innovation orientation is a key predictor of e-commerce adoption in SMMEs.

It is therefore based on this that the study is strengthening the body of knowledge with the fact that entrepreneurs adopt m-commerce not only for utility but because they see it as a strategic innovation offering competitive advantage and market expansion.

## 6.2. Technology Acceptance Model (TAM)

The technology acceptance model (TAM) provides a robust framework for understanding the adoption of mobile commerce (m-commerce) among small, medium, and micro, enterprises (SMMEs). TAM suggests that perceived usefulness (PU) and perceived ease of use (PEOU) are the key determinants of technology adoption (Davis, 1989). These factors positively impact the willingness of SMMEs to integrate m-commerce into their operations.

**Table 1: TAM Constructs and definitions**

| <b>TAM Construct</b>             | <b>Definition</b>                                                                                                                                                             |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Perceived Usefulness (PU)        | Belief that m-commerce enhances business performance Yaqub <i>et al.</i> , (2024) found PU to be the strongest predictor of m-commerce adoption during COVID-19 Pandemic      |
| Perceived Ease of Use (PEOU)     | Belief that m-commerce is easy to implement. Manida (2025) confirmed the role of PEOU in e-commerce adoption among SMMEs                                                      |
| Attitude Toward Using (ATU)      | Overall positive or negative feeling about using m-commerce. Yaqub <i>et al.</i> , (2024) showed that ATU mediates the relationship between PU/PEOU and Behavioural Intention |
| Behavioral Intention to Use (BI) | Likelihood of adopting m-commerce in the near future. BI was found to be a direct predictor of actual usage in multiple TAM extensions.                                       |

The relationship between technology acceptance and the adoption of m-commerce among SMMEs is significantly influenced by factors outlined in models like TAM. Understanding these relationships can aid in developing strategies to enhance m-commerce adoption among SMMEs. This study's hypothesis:

*H1: Technology acceptance model factors positively influence m-commerce adoption among SMMEs.*

### **6.2.1. Perceived Ease of Use and Mobile Commerce Adoption by SMMEs in South Africa**

The adoption of mobile commerce (m-commerce) among small, medium and micro- enterprises (SMMEs) in South Africa is influenced by various factors, with perceived ease of use being one of the most critical determinants. According to the technology acceptance model (TAM), proposed by Davis (1989), perceived ease of use (PEOU) plays a significant role in shaping the attitudes and intentions of users toward adopting new technologies, including m-commerce platforms. This is particularly important for SMMEs in South Africa, where technology adoption can lead to increased efficiency, competitiveness, and growth.

SMME owners or employees believe that using m-commerce platforms will be free from effort. For SMMEs in South Africa, which often face resource constraints and limited technical expertise, the ease of use of a m-commerce system is crucial. If an m-commerce platform is perceived as too complex or difficult to navigate, SMMEs are less likely to adopt it. On the other hand, if the platform is seen as easy to use and does not require significant technical knowledge, SMMEs are more inclined to integrate it into their business operations (Al-Qeisi, 2018).

In the context of South Africa, SMMEs operate in a market characterised by both opportunities and challenges. The rapid growth of mobile technology presents a unique opportunity for these businesses to reach new customers, reduce operational costs, and enhance customer engagement. However, the adoption of mobile commerce depends on how easy it is for businesses to adopt and use the technology (Sithole *et al.*, 2021). Research shows that SMMEs are more likely to embrace m-commerce if the systems are intuitive, user-friendly, and provide tangible benefits in terms of convenience and efficiency (Sithole *et al.*, 2021).

For South African SMMEs, the perceived ease of use of m-commerce platforms is influenced by several factors:

- **User-friendliness:** The simpler and more intuitive the m-commerce platform, the more likely it is that SMMEs will perceive it as easy to use. If the technology requires minimal training or learning, it enhances adoption (Al-Qeisi, 2018).
- **Cost and accessibility:** M-commerce platforms that are affordable and easily accessible through mobile devices or low-cost internet connections are more likely to be perceived as easy to use. In South Africa, where internet access can be limited, having affordable mobile solutions is crucial (Munyanyi, et al., 2017).
- **Customer support and training:** Availability of technical support and training resources for SMMEs is essential to improving their perception of ease of use. SMMEs are more likely to adopt m-commerce if they feel supported in overcoming any technical challenges (Munyanyi, 2014).

The perceived ease of use of m-commerce directly impacts the intention to adopt and the actual usage of these platforms by SMMEs. According to Davis (1989), when a technology is perceived as easy to use, it enhances its perceived usefulness, which further drives adoption. For South African SMMEs, adopting m-commerce can significantly improve business operations, enhance customer interaction, and open new revenue streams. SMMEs that perceive mobile platforms as easy to use are more likely to integrate m-commerce into their business processes, thereby improving their overall competitive advantage (Al-Qeisi, 2018). Therefore, this study postulates that:

*H<sub>at</sub>: Perceived ease of use positively predicts m-commerce adoption among SMMEs.*

### **6.2.2. Perceived Usefulness and Mobile Commerce Adoption by SMMEs in South Africa**

Perceived usefulness (PU) is a critical factor influencing the adoption of mobile commerce (m-commerce) among small, medium and micro enterprises (SMMEs) in South Africa. PU refers to the degree to which an individual believes that using a particular system would enhance their job performance (Davis, 1989).

Research indicates that PU significantly predicts m-commerce adoption among SMMEs in South Africa. Similarly, Chau and Deng (2018) identified perceived benefits, including PU, as key technological factors affecting the intention of SMMEs to adopt m-commerce.

Further supporting this, a study on the adoption and diffusion of e-commerce by township SMMEs in Soweto revealed that perceived benefits and perceived usefulness significantly influence e-commerce adoption decisions (Gallant, 2024). This suggests that when SMMEs perceive m-commerce as useful, they are more likely to integrate it into their operations.

In addition to PU, other factors such as perceived ease of use, social influence, and facilitating conditions also play a role in the adoption of m-commerce. However, PU remains a dominant predictor, underscoring the importance of m-commerce solution providers to clearly demonstrate the practical benefits of their technologies to potential SMME users (Sulaiman *et al.*, 2019).

Enhancing the perceived usefulness of m-commerce solutions is essential for encouraging adoption among South African SMMEs. By effectively communicating and delivering tangible benefits, m-commerce providers can facilitate greater integration of mobile technologies in the SMME sector. This study proposes that:

*H<sub>a2</sub>: Perceived usefulness positively predicts m-commerce adoption among SMMEs.*

**Table 2: Alignment of the main research question, hypothesis and Theoretical Framework**

| Item              | Innovation Theory                                                 | TAM                                                                   |
|-------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------|
| Research Question | Explains <i>why</i> entrepreneurs pursue m-commerce as innovation | Explains <i>how</i> perceptions of usefulness and ease drive adoption |
| H <sub>1</sub>    | Entrepreneurs adopt m-commerce for strategic advantage            | PU and PEOU positively influence adoption                             |
| H <sub>a1</sub>   | Risk-taking and innovation readiness support ease of use          | PEOU directly predicts adoption                                       |
| H <sub>a2</sub>   | Competitive advantage aligns with perceived usefulness            | PU directly predicts adoption                                         |

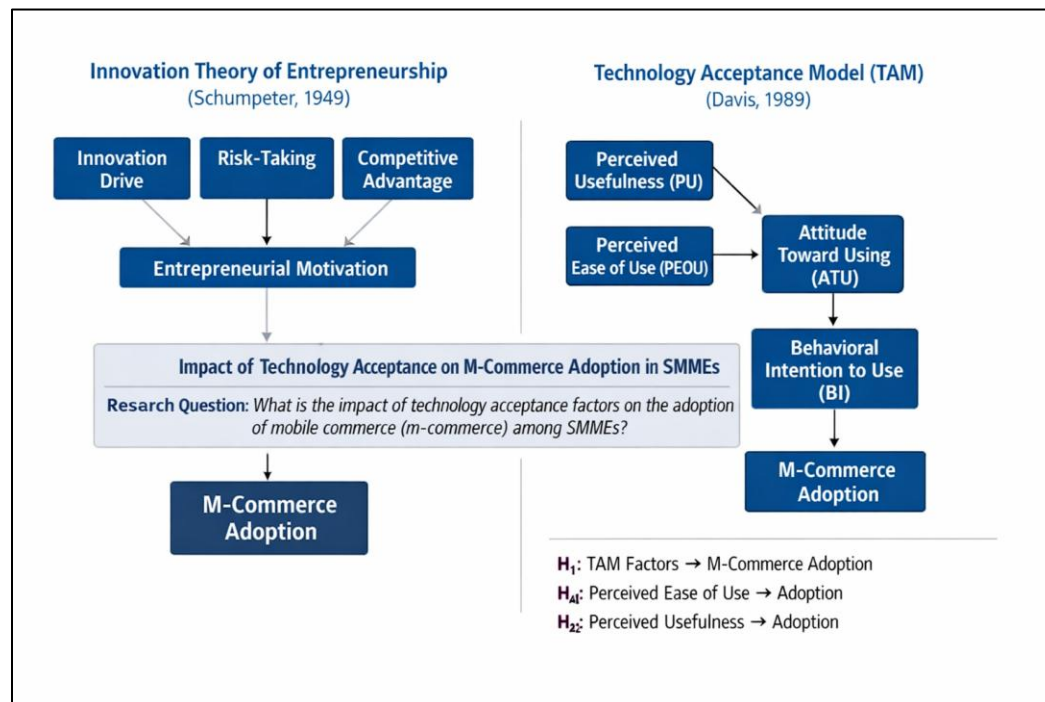


**Figure 4: Dual Theoretical Lens for M-Commerce Adoption in SMMEs. Source: Researcher's Own with AI aid**

To explain the adoption of mobile commerce (m-commerce) among small, medium, and micro enterprises (SMMEs), Figure 4 is a strategic combination of the two different but complementary theories:

- i) Schumpeter's 1949 Innovation Theory of Entrepreneurship, which emphasises innovation, risk-taking, and competitive advantage, explains the strategic and opportunity-driven incentives behind adoption.
- ii) The perceptual and behavioural aspects, such as Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Using (ATU), and Behavioural Intention to Use (BI), are captured by the Technology Acceptance Model (TAM) (Davis, 1989). When taken as a whole, these theories support the research question and hypotheses of the study and provide a strong framework for comprehending the cognitive adoption of m-commerce technologies as well as the entrepreneurial motivation.

## **7. Research Methodology**

This study adopted a quantitative research design, targeting 261 SMMEs in Polokwane, South Africa, and selecting 146 SMMEs through random sampling. This approach is particularly useful in situations where random sampling of the data set is not feasible (Vandekerckhof *et al.*, 2019), as it enables the selection of a larger and more diverse sample, thereby reducing sampling bias. Data collection was conducted using a closed-ended, self-administered questionnaire. A pilot study was carried out to assess participation rates, and minor adjustments were made to clarify technical terms. A cover letter accompanied the questionnaire, explaining the purpose of the study and ensuring participant anonymity. Participation was voluntary, with data used strictly for research purposes. The questionnaire focused on three key constructs – technology acceptance, perceived ease of use and perceived usefulness, collectively referred to as technological contextual factors. Each construct was measured using three items on a five-point Likert scale (ranging from *strongly disagree* to *strongly agree*). ANOVA was employed to analyse these constructs, while regression analysis was used to examine the impact of technological contextual factors. Reliability was assessed using Cronbach's alpha, with all values exceeding the recommended 0.7 threshold (Taber, 2018), confirming the reliability of the instrument. Normality testing was conducted using the Kolmogorov-Smirnov test, yielding values above 0.05 for all independent variables, indicating a normal distribution. Descriptive statistics – including mean, standard deviation, skewness, and kurtosis provided insights into the data distribution (Hair *et al.*, 2017).

## **8. Findings**

### **8.1. Reliability Testing**

The authors used Cronbach's alpha test for reliability illustrated in Table 3. The data collection instrument is deemed reliable based on Cronbach's alpha values exceeding the accepted threshold of 0.70. All the measured constructs were above 0.7.

**Table 3: Test for reliability**

| Constructs                   | Cronbach's alpha |
|------------------------------|------------------|
| Perceived ease of use (PEOU) | 0.72             |
| Perceived usefulness (PU)    | 0.75             |
| M-commerce adoption          | 0.77             |

## 8.2. Descriptive Statistics

According to Hair *et al.*, (2017:61), “Skewness measures the degree to which a variable’s distribution is symmetrical while Kurtosis is a measure of whether the distribution is too peaked (a very narrow distribution with most of the responses in the center).” The general rule is that for data to be normal, the values for both skewness and kurtosis should lie within +1 and -1. All measured constructs satisfied the rule of thumb.

**Table 4: Perceived ease of use and m-commerce adoption**

|                              | Mean      | Std. deviation | Skewness  |            | Kurtosis  |            |
|------------------------------|-----------|----------------|-----------|------------|-----------|------------|
|                              | Statistic | Statistic      | Statistic | Std. error | Statistic | Std. error |
| M-commerce adoption          | 34.2192   | 5.59575        | -.215     | .281       | .042      | .555       |
| Perceived ease of use (PEOU) | 16.6575   | 2.37592        | -.435     | .281       | -.548     | .555       |
| Perceived usefulness (PU)    | 12.4110   | 2.01960        | -.782     | .281       | .457      | .555       |

Table 4, the descriptive statistics for the three variables provide insights into their distribution and central tendency. M-commerce adoption has a mean score of 34.22 with a standard deviation of 5.60, indicating moderate variability among respondents. Its skewness (-0.215) suggests a slight left skew, while kurtosis (0.042) indicates a distribution close to normal. Perceived ease of use shows a mean of 16.66 and a standard deviation of 2.38, with a skewness of -0.435, implying a more pronounced left skew, and a kurtosis of -0.548, suggesting a flatter distribution compared to normal. Perceived usefulness has a mean of 12.41 and a standard deviation of 2.02, with skewness at -0.782, indicating a stronger left skew, and kurtosis at 0.457, reflecting a slightly peaked distribution. Overall, the data suggests that while responses generally cluster around the mean, perceived usefulness and ease of use exhibit more skewness than m-commerce adoption, which appears relatively balanced.

**Table 5: Perceived ease of use and m-commerce adoption**

| ANOVA <sup>a</sup> |            |                |    |             |        |                   |
|--------------------|------------|----------------|----|-------------|--------|-------------------|
| Model              |            | Sum of squares | Df | Mean square | F      | Sig.              |
| 1                  | Regression | 307.421        | 1  | 307.421     | 11.210 | .001 <sup>b</sup> |
|                    | Residual   | 1947.072       | 71 | 27.424      |        |                   |
|                    | Total      | 2254.493       | 72 |             |        |                   |

- a) *Dependent variable: Mobile commerce adoption*  
b) *Predictors: (Constant), Perceived ease of use (PEOU)*

The ANOVA test in Table 5, which is  $0.001 < \alpha$  at .05, shows that the results are statistically significant. The F-statistic value of  $F = 11.210$  ( $p < .001$ ) also shows that the results are significant. This indicates that the alternative hypothesis is accepted. The significant level of 0.001 shows that the perceived ease of use positively influences the level of m-commerce adoption. When considered collectively within the model, the technological acceptance variables developed from the Technology Acceptance Model (TAM) strongly predicted the adoption of m-commerce, according to the ANOVA results. A significant amount of information systems research supports this conclusion (Davis, 1989; Venkatesh *et al.*, 2003). As a strong paradigm for describing user acceptance of a variety of technologies, including e-commerce and its mobile counterpart, TAM has received extensive validation (Chan *et al.*, 2022). However, a closer look of each path coefficient paints a more complex picture. Perceived ease of use did not have a statistically significant direct effect on m-commerce adoption in this particular scenario, despite perceived usefulness emerging as a consistently strong and substantial predictor, confirming its position as a main extrinsic motivator (Davis, 1989; Ertz *et al.*, 2022).

Although it may seem contradictory, this non-significant finding for perceived ease of use is not unprecedented in the literature. The direct effect of ease of use on adoption intention might decrease as technology gets more commonplace and users grow more sophisticated, according to several research (Venkatesh *et al.*, 2003; Šumak, Šorgo, and Herčko, 2017). This effect is frequently entirely mediated by perceived usefulness. For example, Mollick *et al.*, (2023) discovered that although intention to use mobile commerce was positively correlated with perceived ease of use, this effect was mediated and possibly mediated by other factors including usefulness. Additionally, meta-analytic reviews have shown that the relationship between behavioral intention and perceived ease of use varies in strength, with some analyses showing only a small-to-trivial direct effect size, indicating that its influence may be context-dependent or overshadowed by other factors (Šumak, Šorgo, and Herčko, 2017; Maestripieri, 2020). Thus, the TAM model's overall importance and the non-significant direct influence of perceived ease of use highlight the intricate interactions among the variables influencing the adoption of m-commerce, where utility continues to be the most important utilitarian motivator.

### 8.3. Perceived Usefulness and M-Commerce Adoption

Perceived usefulness is defined as the degree to which an individual believes that using a particular technology will enhance performance (Davis, 1989).

**Table 6: Perceived usefulness and m-commerce adoption**

| ANOVA <sup>a</sup> |            |                |    |             |       |                   |
|--------------------|------------|----------------|----|-------------|-------|-------------------|
| Model              |            | Sum of squares | Df | Mean square | F     | Sig.              |
| 1                  | Regression | 247.180        | 1  | 247.180     | 8.743 | .004 <sup>b</sup> |
|                    | Residual   | 2007.313       | 71 | 28.272      |       |                   |
|                    | Total      | 2254.493       | 72 |             |       |                   |

- a. *Dependent variable: Mobile commerce adoption*

b) *Predictors: (Constant), Perceived usefulness*

The ANOVA test in Table 6, which is  $0.004 < \alpha$  at .05, shows that the results are statistically significant. The F-statistic value of ( $F = 8.743$ ,  $p < .004$ ) also shows that the results are significant. This indicates that the alternative hypothesis is accepted. The significance level of 0.004 shows that the perceived ease of usefulness positively influences the adoption of mobile commerce.

**Table 7: Regression**

| Model Summary <sup>b</sup> |                   |          |                   |                            |               |
|----------------------------|-------------------|----------|-------------------|----------------------------|---------------|
| Model                      | R                 | R square | Adjusted R square | Std. error of the estimate | Durbin-Watson |
| 1                          | .307 <sup>a</sup> | .094     | .082              | 4.36630                    | 1.960         |

a) *Predictors: (Constant), PU, PEOU*

b) *Dependent Variable: MCA*

**Table 8: M-commerce adoption**

| Model |            | Unstandardised coefficients |            | Standardised coefficients | t     | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|-------|------|
|       |            | B                           | Std. error | Beta                      |       |      |
| 1     | (Constant) | 22.835                      | 3.356      |                           | 6.803 | .000 |
|       | PEOU       | .586                        | .239       | .218                      | 2.455 | .015 |
|       | PU         | .311                        | .196       | .141                      | 1.589 | .114 |

*M-commerce adoption is  $0.586PEOU + 22.835$*

*R Square = .094*

In Table 8, it is evident that R is the percentage variation explained by the two variables. Therefore, the results show that 9.4% of mobile commerce adoption variance is explained by perceived ease of use only in the model. Considering the unstandardised coefficients, findings show that it is mainly *perceived ease of use* that significantly predicts m-commerce adoption. The implication of this finding is that maybe the respondents view PEOU as more important than useful.

#### **8.4. Conclusion on the Hypothesis**

In Table 9 the hypothesis testing results reveal an interesting dynamic in the relationship between technology acceptance factors and m-commerce adoption among SMMEs. The overall hypothesis (H1), which proposed that technology acceptance model factors collectively influence m-commerce adoption, was rejected, suggesting that the combined effect of these factors is not statistically significant. However, when examined individually, two critical components perceived ease of use (Ha1) and perceived usefulness (Ha2) were both accepted. This indicates that SMMEs are more likely to adopt m-commerce when they find the technology simple to use and believe it offers tangible benefits to their business operations. These

findings highlight that while the broader model may not hold as a unified predictor, specific elements within it play a decisive role in driving adoption behavior.

**Table 9: Conclusion on hypothesis**

| Tested hypotheses                                                                                          | Final decision |
|------------------------------------------------------------------------------------------------------------|----------------|
| H <sub>1</sub> : Technology acceptance model factors positively influence m-commerce adoption among SMMEs. | Rejected       |
| H <sub>a1</sub> : Perceived ease of use positively predicts m-commerce adoption among SMMEs.               | Accepted       |
| H <sub>a2</sub> : Perceived usefulness positively predicts m-commerce adoption among SMMEs.                | Accepted       |

## **9. Contribution Towards the Body of Knowledge**

This study makes a significant contribution to the body of knowledge by exploring the relationship between m-commerce adoption and technology acceptance within the context of SMMEs in Polokwane Municipality. It advances understanding of how key factors, such as perceived usefulness (PU) and perceived ease of use (PEOU), influence the adoption of mobile technologies by small businesses. By examining these dynamics, the research adds valuable insights into the broader discourse on technology adoption, particularly within the context of SMMEs, and highlights the potential implications for business success. These findings can guide future research, inform policy decisions, and assist in the development of targeted strategies to facilitate m-commerce adoption, thereby fostering growth and sustainability for small businesses in the region.

## **10. Limitations**

One of the primary limitations of this study is its geographical scope. The research focuses solely on SMMEs within the Polokwane Municipality, which may limit the generalisability of the findings to other regions or countries. Different cultural, economic, or technological contexts could result in varying adoption patterns of m-commerce. Another limitation is the sample size, as the study may not have captured the full diversity of SMMEs in the region, potentially leading to biased results. Additionally, the research mainly examines perceived usefulness (PU) and perceived ease of use (PEOU), overlooking other factors that may influence m-commerce adoption, such as social influence, facilitating conditions, and government policies. Finally, the study relies on self-reported data, which may be subject to social desirability bias or inaccuracies in the responses provided by participants.

## **11. Recommendations**

### **11.1. Fostering a Supportive Business Climate**

Based on the findings that perceived usefulness is the main driver of the adoption of m-commerce, while perceived ease of use plays a more indirect role, it is imperative for stakeholders to cultivate a supportive business climate that enhances the utilitarian value of mobile commerce for consumers. In this context, a supportive business climate, refers to the regulatory, infrastructural, and collaborative environment that

enables m-commerce providers to innovate and deliver superior value. The following initiatives are recommended to achieve this:

*Incentivize Usefulness-Driven Innovation through Regulatory Sandboxes:* To directly address the paramount importance of perceived usefulness, governments and regulatory bodies should establish industry-specific regulatory sandboxes. These controlled environments allow fintech companies, mobile payment platforms, and retail innovators to test cutting-edge, value-added services without the immediate burden of full regulatory compliance (Goo and Heo, 2020). By permitting experimentation with features such as AI-driven personalised shopping assistants, "buy now, pay later" (BNPL) integrations, or seamless loyalty program aggregations, regulators can accelerate the development of functionalities that consumers find genuinely useful. This approach reduces the time-to-market for innovations that enhance the utility of m-commerce, directly targeting the strongest predictor of adoption identified in this study.

*Strengthen Digital Infrastructure to Enhance Core Utility:* The usefulness of m-commerce is inherently tied to the reliability of the underlying infrastructure. Policymakers should prioritize investments in high-speed mobile broadband (such as 5G and future generations) and ensure equitable access across urban and rural divides (Dwivedi *et al.*, 2021). A slow or unreliable connection directly undermines the usefulness of any mobile application. Furthermore, initiatives to standardise interoperable payment systems, such as national QR code standards or open banking APIs can remove friction from transactions, making mobile commerce a more consistently useful and reliable alternative to physical payment methods (Shen *et al.*, 2022). When the infrastructure is robust, the usefulness of shopping on a mobile device (specifically its speed and reliability) is significantly amplified.

*Develop Public-Private Partnerships for Digital Literacy and Trust:* While perceived ease of use was not a direct significant predictor, its influence is often mediated by usefulness. Consumers cannot perceive a technology as useful if they do not understand how to use it effectively. Therefore, a collaborative initiative between government agencies, private m-commerce firms, and non-profit organisations should be launched to deliver targeted digital literacy campaigns (Zhao and Bacao, 2021). These campaigns should move beyond basic "how-to" instruction and focus on demonstrating the useful applications of m-commerce, such as managing personal finances, accessing government services, or supporting local businesses through mobile platforms. By building consumer competence and confidence, these partnerships indirectly support ease of use while directly showcasing the practical utility of the technology, thereby reinforcing the primary driver of adoption.

*Implement Consumer-Centric Data Protection Frameworks:* A supportive business climate is also one that ensures consumer safety. Concerns regarding data privacy and security can severely undermine the perceived usefulness of m-commerce; if a consumer fears financial loss or data misuse, the application ceases to be useful to them (Bandyopadhyay, 2022). It is recommended that industry associations work in tandem with data protection authorities to co-create transparent, consumer-centric privacy frameworks. This could involve developing clear, standardised icons that explain data usage policies (similar to nutritional labels) or establishing industry-wide security certifications that are visibly displayed on m-commerce platforms. Such initiatives foster trust, ensuring that the usefulness of mobile commerce is not negated by security anxieties.

*Foster Collaborative Ecosystems for Seamless Service Integration:* The usefulness of a single m-commerce platform is often amplified by its integration into a wider ecosystem. Policymakers and industry leaders should encourage collaboration between different sectors such as retail, transportation, and banking to create integrated service platforms (Wang, 2023). For example, initiatives that allow a consumer to book a ride, order food, and pay a utility bill within a unified mobile wallet ecosystem enhance the aggregated usefulness of mobile commerce. By breaking down silos and promoting API-sharing agreements (with appropriate safeguards), a supportive business climate can facilitate the creation of "super-apps" or integrated platforms that maximize the perceived usefulness for the end-user, thereby driving higher adoption rates.

To address the limitations, future studies should consider expanding the research to other municipalities or regions to compare adoption trends and identify context-specific challenges and opportunities. A larger and more diverse sample size would provide a more representative view of m-commerce adoption across various sectors and business sizes. Future research could also explore additional factors such as social influence, trust, and security concerns, which play a crucial role in technology acceptance, and investigate how these elements interact with PU and PEOU. For practitioners, it is recommended that m-commerce solution providers offer customised support to SMMEs by designing user-friendly platforms that align with the specific needs of small businesses in different sectors. Training programmes that enhance digital literacy among SMME owners and employees can help overcome barriers to adoption. Policymakers should consider creating enabling environments for digital transformation, such as improving internet infrastructure and addressing cybersecurity concerns, to facilitate smoother integration of m-commerce in small businesses. Lastly, longitudinal studies could be conducted to track the impact of m-commerce adoption on business performance over time, providing a deeper understanding of its long-term benefits and challenges.

## **12. Conclusion**

The adoption of mobile commerce by SMMEs in South Africa is significantly influenced by perceived ease of use. The simpler and more intuitive the technology, the more likely SMMEs are to adopt it. Given the rapid growth of mobile technology and the increasing importance of digital platforms for business success, understanding how perceived ease of use affects m-commerce adoption is essential for designing systems that meet the needs of SMMEs in South Africa. Providing user-friendly, affordable, and well-supported m-commerce platforms can help SMMEs overcome barriers to adoption and leverage the full potential of mobile technology. Based on the findings, stakeholders should develop actionable strategies that address technology acceptance factors and support successful m-commerce implementation among SMMEs in the Polokwane Municipality.

## **13. Acknowledgements**

### **Authors' Contributions**

Conceptualisation, M.M.; K.K.; methodology, M.M.; K.K.; validation, M.M.; K.K.; formal analysis, M.M.; K.K.; investigation, M.M.; K.K.; resources, M.M.; K.K.; writing-original draft preparation, M.M.; K.K.; writing-review and editing, M.M.; K.K.

### Funding

This research was funded by North-West University, School of Management Science, Mahikeng Campus

### Informed Consent Statement

Informed consent was obtained from all subjects (Polokwane Municipality SMMEs' Owners) involved in the study.

### Data Availability Statement

The data presented in this study is contained throughout the study.

### Conflicts of Interest

The authors declare no conflict of interest.

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