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# EFFECTS OF THE DIGITAL PAYMENT SYSTEM ON SMEs PERFORMANCE IN DEVELOPING COUNTRIES; A CASE OF GHANA

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## ABSTRACT

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***Small and medium enterprises can employ a digital payment system to increase the trade and satisfy the trading partners and other stakeholders. The use of digital payment system faster the business transactions, and decrease the cost among parties. This study conducted to examines the effects of the digital payment system on SME's performance. This study used a technology-organizational-environmental framework to investigate the effects of the digital payment system. This study used a closed-ended self-administered questionnaire to collect data. Data collected from September 2019 to November 2019. The respondents of the study were executives and owners of SMEs. The partial least squares structural equation modeling approach utilized to analyze the data. The findings of the study include significant effects of technology, organizational, environmental, and use of digital payment systems on SME's performance. This study helps the owner of SME's to execute the digital payment system to foster trade and relationship with stakeholders.***

**KEYWORDS:** ***Small and medium enterprises, Digital payment system, technological-organizational-environmental framework, Developing countries, SME's performance, Ghana***

## 1. INTRODUCTION

Globally, small and medium enterprises (SMEs) are entering into the 4.0 era, in which optimization has been employing the big data, the technology of artificial intelligence, and the Internet of Things (Wahlster, 2012). In this era, technology innovation is playing a significant role in producing products or services. Products or services are not evaluated only by its utility and functions, but also by the convenience of use, efficiency, and delivery time. Technology innovation happens across the sectors and industries, also in the finance sector (Mustapha, 2018); the digital payment system is considered the newest form in many developing countries.

According to (Sanghita & Indrajit, 2017), it is defined as a "collection of components and processes that enables two or more parties to transact and exchange monetary value via electronic means." There are increasing issues related to the traditional (paper-based) form of the payment system, such as the significant cost involved in printing cash, risk of theft and robbery, increasing cost of employment, the establishment of branches to handle cash, mutilated noted (Xena & Rahadi, 2019). Whereas digital payment system provides several advantages such as transparent transaction, cost savings, faster payouts, decrease time use, better tracking, and increased trust, user-friendly, expense control and so on (Fatonah, Yulandari, & Wibowo, 2018). The advancement in technology encourages payment paradigm form paper-based payment systems to the digital payment system. Additionally, in developing countries government (Mishra, 2017) and management supports (AlBar & Hoque, 2019), the use of digital payment.

In particular, Ghana is considered one of the fastest-growing mobile money markets in Africa; in 2017, the total value of the mobile money reached $ 29 billion (Ozyurt, 2019), and in 2018, over 13 million active accounts noted (Digital, 2019). The literacy rate of the country increased from 59.9 percent in 2000 to 79.0 percent in 2018 and is emerging with 17.02 percent (Knoema, 2018). According to Global Connectivity Index, the country is ranked 71 (Knoema, 2018), with a 39 percent internet penetration rate (IWS, 2019). (Amediku, 2019), stated that various economic, public policy, and financial factors are encouraging determinants behind the shift of payment system in Ghana. Nowadays', the country's government is enthusiastically investing in e-payment methods such as PayPal. These services will sooner enable SMEs' to receive the payment across the globe (JB, 2018). Globally, SME's constitute over 90 percent of enterprises, generate approximately 50 percent of employment and contribute over 40 percent to GDP in developing countries (WB, 2019). Specifically, in Ghana, SMEs account for more than 92 percent to all businesses, and contribution to GDP exceeds 70 percent (Peprah, Mensah, & Akosah, 2016). The existing literature confirmed the significance of SMEs in the growth of economies (Fening, Appiah, & Frempong, 2017; Han, Xiang, & Yang, 2018; Rahman, Ahmad, & Taghizadeh, 2019).

The prior studies investigated the factor affecting the adoption of digital payment system includes entrepreneur characteristics, ease of use (Sokobe, 2015), trust, cost, security, convenience, benefits awareness, IT skills, flexibility (Kabir, Saidin, & Ahmi, 2017), behavioral intention to use digital payment system and innovation resistance to use digital payment system (Sivathanu, 2019), perceived usefulness, perceived benefits and perceived ease of use. Most of the scholar employed the technology acceptance model (Davis, 1989), Unified Theory of Acceptance and Use of technology(Venkatesh, Morris, Davis, & Davis, 2003). This article employs diffusion of innovation (DOI) theory (Rogers, Singhal, & Quinlan, 2003), and Technology, organizational, environmental (TOE) (Tornatzky, Fleischer, & Chakrabarti, 1990) framework to investigate the effects of the digital payment system on SMEs' performance in developing countries. Though, enough literature is available on antecedents and intention to use of the digital payment system. However, very few related discussed the effects of the digital payment system on SMEs' performance. Henceforth, this, the study contributes to the existing literature of the TOE model, DOI theory and developing countries specifically Ghana.

This paper initiate with a literature-based on the use of the digital payment system and its effects on SMEs' performance. It then includes the methodology and results analysis, research limitation, and future studies.

## 2. LITERATURE REVIEW

### 2.1 Theoretical Support

The existing studies using the TOE framework have investigated the various factors and found such determinants vital for many information system usages (Seethamraju & Diatha, 2019). Such as (Soto-Acosta, Popa, & Palacios-Marqués, 2017) used the TOE framework to develop the conceptual model to investigate the effects of human resource practices and web knowledge is sharing on innovation performance in SMEs' of the manufacturing sector in developing countries. Moreover, (Ahmad, Abu Bakar, & Ahmad, 2019), also used a TOE framework based on DOI to investigate the effects of social media adoption on SMEs' performance. Besides, (Aboelmaged, 2018), investigate the factors of sustainable practices and their effects on competitive capabilities by employing the TOE framework. This article employs the TOE model along with the few characteristics of DOI theory to investigate the impacts of the digital payment system on SMEs' performance. Additionally, with regards to the environmental perspective which is not apart from the DOI theory, hence the author believes that TOE is the most appropriate model to be employed. As displayed in figure I, of the conceptual model, each construct has separate dimensions. The computability, cost-effectiveness, relative advantage of technology construct, top management support of organizational construct and external pressure of environmental construct.

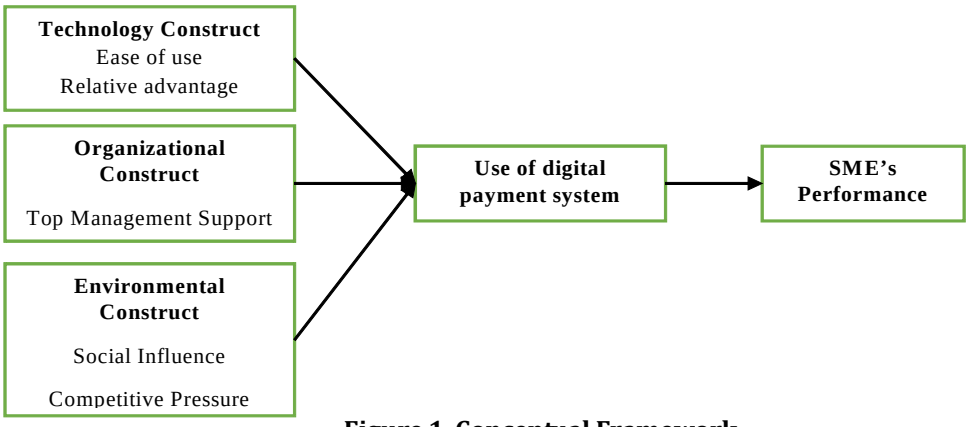


**Figure 1. Conceptual Framework**

### 2.2 Hypothesis construction

#### 2.2.1 Technological Support

This study used three characteristics of innovation, such as compatibility, relative advantage, and cost-effectiveness (Eelu & Nakakawa, 2018; Trivedi & Mago, 2013). Ease of use is the extent to which an individuals' beliefs that implementation of new technology would be "free of effort" (Hidayanto, Hidayat, Sandhyaduhita, & Handayani, 2015). In support, (Özkan, Bindusara, & Hackney, 2010), found a significant relationship between ease of use or usability and intention to use the digital payment system. Relative advantage is the degree to which supporters of the new technology think particular innovation provides more benefits as compared to available. (Liao & Chen, 2019), found a significant relationship between relative advantage and intention to use the digital payment system. Therefore, following the hypothesis proposed.

H1: Technology construct has significant effects on the use of digital payment systems in developing countries.

#### 2.2.2 Organizational Construct

This construct includes the internal characteristics of the firms, for instance, the size of the firms, organizational structure and culture, employees' behavior and so on. The author argued that managerial support encourages employees towards the usage of an electronic payment system or any of the newest technology. (Qatawneh, Aldhmour, & Alfugara, 2015), studied the impact of an electronic payment system in the telecommunication industry of Jordon, the sample of study includes 320 employees of Orange company. The findings of the study showed a significant impact of top management support to the adoption of the electronic payment system, with 32.8 percent variation. Also, (Yusof, Hariri, Mohamed, & Taheer), investigate the impacts of top management support towards the adoption of the digital payment system in Malaysian SMEs. The study directed to 121 employees of the different business sectors. The findings of the study include significant impacts of top management support. In addition, (Ifinedo, 2012), found the significant relationship between top management support and intention to use digital payment system. Yet, this study suggested the following hypothesis;

H2: Organizational construct has significant effects on the use of digital payment systems in developing countries.

#### 2.2.3 Environmental Construct

This construct includes the determinants that come from outside the firms. It mainly includes the competitor, government regulations, competitive industry, supplier, customer, and society at large. This study includes social influence and competitive pressure as an essential factor to affect the adoption of the digital payment system in SME's in developing countries (Xena & Rahadi, 2019). (Igudia, 2017), scholarship reflected that pressures from trading partners, suppliers, and competitors affect the adoption and use of digital payment systems in SMEs. According to (Musa, Khan, & AlShare, 2015), Social influence is defined as the "degree to which an individual perceives that importance of other's belief that he or she should use the technology." (Hidayanto et al., 2015), studied the effects of several factors and behavioral intentions in the e-payment system. The study analyzed the 203 Indonesian customers and found a significant relationship between social influence and intention to use the digital payment system. (Fatonah et al., 2018), also showed the positive effects of social influence on the use of a digital payment system. Therefore, the following hypothesis proposed;

H3: Environmental construct has significant effects on the use of digital payment systems in developing countries.

#### 2.2.4 Use of digital payment system and SME's performance

Admittedly, none of an economy can grow in the international market without emerging a flexible and proper platform for competition, particularly in commerce and trade through electronic business and commerce. Henceforth, SME's in developing countries must move on from paper-based payment systems to a digital payment system, which enables them to compete with multinational companies inside and outside the boundary (Chaffey, Hemphill, & Edmundson-Bird, 2019). (Nyaga, 2017), the study found the significant influence of mobile money services on SME's performance in Kenya. Besides, (Scott, Van Reenen, & Zachariadis, 2017), investigate the effects of the adoption of SWIFT on bank performance. The little studies conducted to investigate the influence of the digital payment system on SME's performance. Therefore, the following hypothesis proposed;

H4: The use of the digital payment system has significant effects on the use of the digital payment system in developing countries.

## 3. METHODOLOGY

### 3.1 Sample size and Data Collection

This study employed the definition of small and medium enterprises as per the recommendation of Ghana statistical service "if any of the firm having the number of employees between 1 and 5 it is called micro, 6 and 30 named small, 31 and 100 called medium, more than 100 named large enterprises." (Amoah & Amoah, 2018). The sample size of the study randomly selected after accumulating data from the Ghana business directory and popular portals such as (Business, 2019; Ghana, 2019). Both portals list the number of SMEs registered and their website information. After, accumulation of SMEs information, key respondents of the study targeted includes managers, and executive, with the hopes that they are more knowledgeable and hold relevant information about the company and the fluctuation in the market (Bergeron, Dubois, Dumont, Dial, & Skrobik, 2001). The self-administered closed-ended questionnaire used to collect responses. An online survey issued to 650 respondents by creating online google form. An Email, invitation were sent to all the respondents, which contain all information regards to the questionnaire and code of ethics that their information would remain anonymous confidential and voluntary (Ahmad et al., 2019). The online survey is generally used to accumulate more information and to reach a scattered population (Kuila, Dhanda, Joardar, Neogy, & Kuila, 2019). In order to ensure the validity and relevance of the survey, an opinion has been sought from two experts based in Ghana. The survey instrument has been structured in two parts. The first part of the questionnaire contains the respondent's general information, and the second part contains the construct question employed in the study.

### 3.2 Measurement Instrument

This study used a well-established scale to measure the constructs. For the assessment of technological construct, two dimensions used the ease of use and relative advantage. For the assessment of ease of use four items taken from the study (Özkan et al., 2010). The relative advantage assessed by five items adapted from the study of (Johnson, Kiser, Washington, & Torres, 2018). Organizational construct evaluated by using top management support, four items used

to assess the construct items borrowed from the study (Ifinedo, 2012). Environmental construct evaluated by employing social influence and competitive pressure. The three items used to evaluate the social influence items for the construct taken from (Junadi[a], 2015), moreover the competitive pressure assessed by three items adapted from (Ahmad et al., 2019). In order to measure the use of the digital payment system four items taken from the study (Ifinedo, 2012). For the assessment of SME's performance six items borrowed from the (Cao, Ajjan, Hong, & Le, 2018; Odoom, Anning-Dorson, & Acheampong, 2017; Parveen, Jaafar, & Ainin, 2016; Tajudeen, Jaafar, & Ainin, 2018). All the items employed measured by five-point Likert scale 1 = strongly disagree, 5 = strongly agree.

## 4. RESULT ANALYSIS

### 4.1 Descriptive Information

We received 217 responses in three months, 176 respondents qualified to sample, while the rest of 41 disqualified from the analysis based on the incomplete response. Demographically (69.8%=123) of respondents were male, (30.1%=53). Most of the respondent's ages in 41 and 50 (38.6%=68). Furthermore, (46.5%=82) and (39.2%=69), holds master and bachelor's degrees respectively. Among them, (65.3%=115) were managers, and (21.0%=37) were executive. Most of the respondents (23.8%=42) working in the retail and wholesale business. Moreover, (41.4%=73) of them working in a firm having 51 to 75 employees.

**Table 1 Respondents information**

| Demographic variables | Frequency | Percentage |
|---|---|---|
| *Gender* | | |
| Male | 123 | 0.698 |
| Female | 53 | 0.301 |
| *Age* | | |
| 21 - 30 | 23 | 0.130 |
| 31 - 40 | 46 | 0.261 |
| 41 - 50 | 68 | 0.386 |
| > 51 | 39 | 0.221 |
| *Education* | | |
| College/Bachelor's | 69 | 0.392 |
| Master | 82 | 0.465 |
| Post-graduate | 25 | 0.142 |
| *Job Title* | | |
| CEO | 24 | 0.136 |
| Executive | 37 | 0.210 |
| Manager | 115 | 0.653 |
| *Business Type* | | |
| Manufacturing | 28 | 0.159 |
| Advertising, Marketing, Sales | 31 | 0.176 |
| Retail, Wholesale | 42 | 0.238 |
| Agriculture and Pharmaceutical | 21 | 0.119 |
| IT technologies | 19 | 0.107 |
| Hospitality | 22 | 0.125 |
| Other | 13 | 0.073 |
| *Workforce* | | |
| 25-Jan | 51 | 0.289 |
| 26 - 50 | 44 | 0.250 |
| 51 - 75 | 73 | 0.414 |
| 76 - 100 | 8 | 0.045 |

### 4.2 Analytical Tool

Present study data collected through an online survey after screening out of invalid respondents analyzed by employing partial least square structural equation modeling (PLS-SEM). Both approached confirmatory factor analysis and structural equation modeling administered to test the appropriated model. The approach of CFA utilized to test convergent validity and reliability of the construct, items having a value less than 0.5 eliminated from the construct (Joseph F Hair, Risher, Sarstedt, & Ringle, 2019). PLS-SEM is used in several disciplines, for instance, social science (Joe F Hair Jr, Matthews, Matthews, & Sarstedt, 2017),

psychology (Willaby, Costa, Burns, MacCann, & Roberts, 2015), medicine (Berglund, Lytsy, & Westerling, 2013). The acceptability of PLS-SEM is growing for the last two decades.

### 4.2.1 Assessment of measurement Model

The measurement model evaluates individual item reliability, internal consistency, convergent validity, and discriminant validity. (Joseph F Hair Jr, Hult, Ringle, & Sarstedt, 2016), suggested that the individual item reliability should be retained between 0.40 and 0.70, as shown in table 2 it lies between 0.661 and 0.947. Furthermore, (Nunnally, 1978), recommended that Cronbach's alpha (CA) must be higher than 0.70. Moreover, the assessment of internal consistency reliability (Bagozzi & Yi, 1988), recommended that composite reliability (CR) of the construct should be higher than 0.70. This study's results of CR lies between 0.894 and 0.971. While, for the assessment of convergent reliability (Fornell & Larcker, 1981), suggested that the average variance extracted (AVE) should be equivalent or exceeds the 0.5. Henceforth, as shown in Table 2, it retained between 0.609 and 0.894. Besides, for the assessment of discriminant validity (Fornell & Larcker, 1981), proposed that the square root of AVE of each construct must be higher than the inter-correlation of the variable used in the model. As shown in table 3. Given the facts shown in the table 2 and 3, this study adequately satisfied the standards.

**Table 2 Measurement model**

| Constructs | Items | Loadings | CA | CR | AVE |
|---|---|---|---|---|---|
| ***Technology Construct*** | | | **0.941** | **0.952** | **0.713** |
| Ease of Use | EOU1 | 0.787 | 0.868 | 0.919 | 0.791 |
| | EOU2 | 0.782 | | | |
| | EOU3 | 0.779 | | | |
| Relative | RA1 | 0.783 | 0.949 | 0.962 | 0.836 |
| Advantage | RA2 | 0.881 | | | |
| | RA3 | 0.918 | | | |
| | RA4 | 0.902 | | | |
| | RA5 | 0.905 | | | |
| ***Organizational Construct*** | | | **0.906** | **0.934** | **0.781** |
| Top Management | TMS1 | 0.882 | 0.906 | 0.934 | 0.781 |
| Support | TMS2 | 0.876 | | | |
| | TMS3 | 0.883 | | | |
| | TMS4 | 0.894 | | | |
| ***Environmental Construct*** | | | **0.892** | **0.916** | **0.609** |
| Competitive | CP1 | 0.779 | 0.84 | 0.894 | 0.68 |
| Pressure | CP2 | 0.813 | | | |
| | CP3 | 0.754 | | | |
| | CP4 | 0.661 | | | |
| Social | SI1 | 0.82 | 0.894 | 0.934 | 0.825 |
| Influence | SI2 | 0.808 | | | |
| | SI3 | 0.814 | | | |
| Use of Digital | UODPS1 | 0.945 | 0.961 | 0.971 | 0.894 |
| Payment | UODPS2 | 0.946 | | | |
| System | UODPS3 | 0.947 | | | |
| | UODPS4 | 0.944 | | | |
| SME's | BP1 | 0.817 | 0.915 | 0.934 | 0.702 |
| Performance | BP2 | 0.89 | | | |
| | BP3 | 0.854 | | | |
| | BP4 | 0.797 | | | |
| | BP5 | 0.843 | | | |
| | BP6 | 0.821 | | | |

**Table 3 Discriminant validity coefficients**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Competitive Pressure | 0.824 | | | | | | |
| Ease of Use | 0.676 | 0.889 | | | | | |
| Relative Advantage | 0.726 | 0.717 | 0.914 | | | | |
| SME's Performance | 0.773 | 0.727 | 0.684 | 0.838 | | | |
| Social Influence | 0.64 | 0.655 | 0.643 | 0.715 | 0.908 | | |
| Top Management Support | 0.601 | 0.557 | 0.591 | 0.706 | 0.575 | 0.884 | |
| Use of Digital Payment System | 0.623 | 0.64 | 0.611 | 0.676 | 0.622 | 0.616 | 0.946 |

### 4.2.2 Assessment of structural model

The structural model assessed through the co-efficient of determination and hypotheses testing. (Wong, 2013), recommended that the structural model employed to measure the linear regression effects of the dependent variables. This study used PLS to find the path co-efficient, p-value, and co-efficient of determination. (Cohen, 1998), recommended that value of R2 0.60, 0.33, and 0.19 respectively named substantial, moderate, and weak. As shown in table 4 value of the coefficient of determination for the use of the digital payment system was 0.545, which indicates that 54.5% of changes in the use of digital payment occur due to constructs used in the study.

Moreover, the 45.7% changes in SME's performance occurs due to the technological, organizational, environmental, and use of digital payment system. Henceforth, given the fact displayed in table 4, the structural model results fall under the shadow of a moderate range (Joe F Hair, Ringle, & Sarstedt, 2011). Furthermore, as shown in table 5 and figure 2, the four hypotheses constructed supported based on the level of significance 0.05, and the beta value of 0.676 reveals that the use of the digital payment system has more significant effects on SME's performance operating in Ghana.

**Table 4 Strength of model**

| | $R^2$ | $R^2$ Adjusted |
|---|---|---|
| Use of Digital Payment System | 0.545 | 0.537 |
| SME's Performance | 0.457 | 0.453 |

**Table 5 Path coefficient and hypothesis testing**

| Hypothesis | Relationship | Beta | Mean | SE | t-value | p-value | Decision |
|---|---|---|---|---|---|---|---|
| H1 | Technology Construct -> Use of Digital Payment System | 0.25 | 0.246 | 0.1 | 2.491 | 0.013 | Supported |
| H2 | Organizational Construct -> Use of Digital Payment System | 0.251 | 0.252 | 0.058 | 4.343 | 0.000 | Supported |
| H3 | Environmental Construct -> Use of Digital Payment System | 0.325 | 0.324 | 0.092 | 3.518 | 0.001 | Supported |
| H4 | Use of Digital Payment System -> SME's Performance | 0.676 | 0.675 | 0.048 | 14.09 | 0.000 | Supported |

Note: p-value <0.05

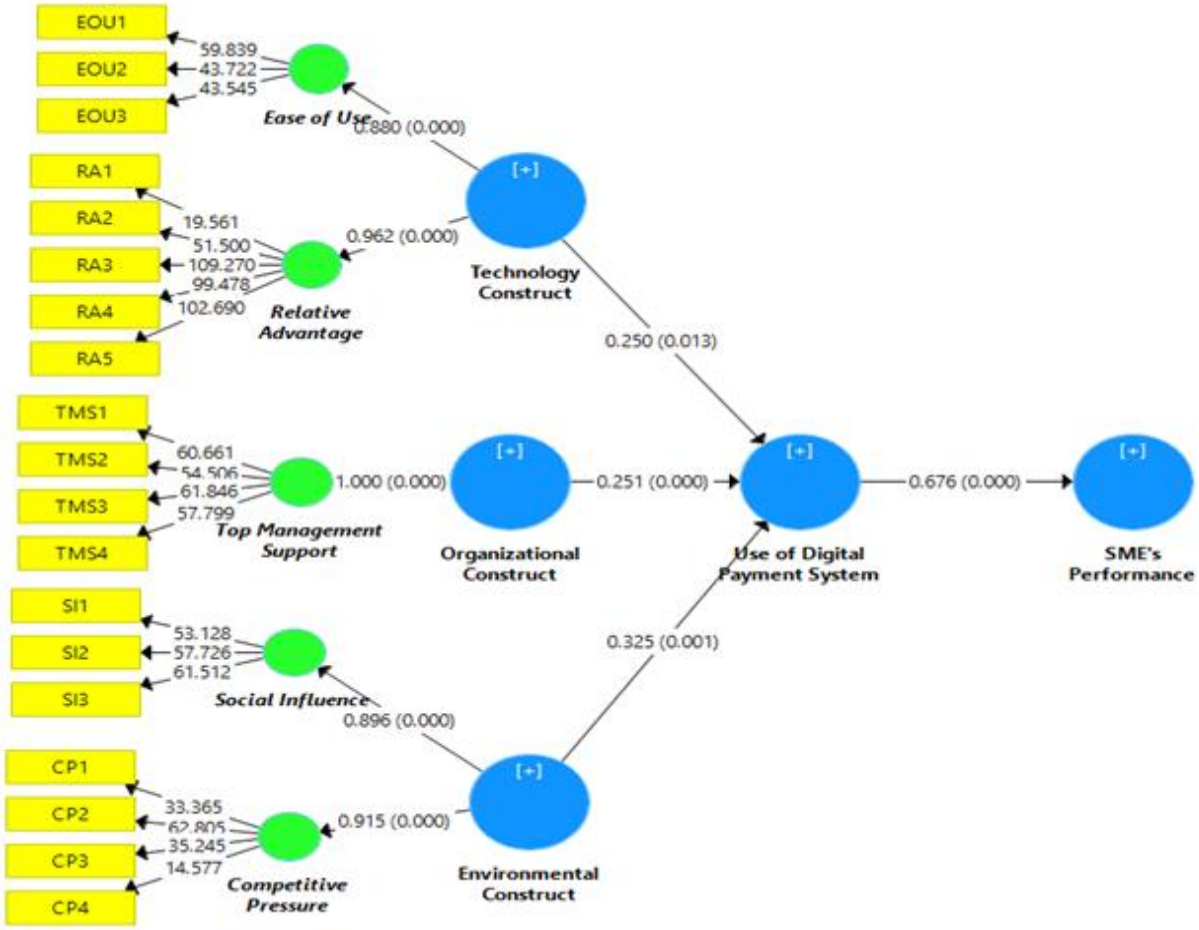


**Figure 2. Structural Equation Modelling**

## 5. DISCUSSION

The outcome of this study found interesting, and very few scholars tested the employed constructs, and the model tested. In particular, several technologies adopted and used by SME's in developing, for instance, cloud computing, e-commerce, social media, enterprise resource planning system, web sharing facilities, and so on. While, the use of a digital payment system found unpredictable in SME's of developing countries, especially Ghana.

The technology construct found relevant in the decision of SMEs to use the digital payment system (p-value=0.013). The most SME's prime to use the digital payment system due to the cumulative benefits it offers, for instance, ease of use and relative advantage. The research findings are consistent with (Johnson et al., 2018).

Organizational construct has significant effects on the use of a digital payment system (p-value=0.000). In particular, most of the studies showed a positive association in the adoption and use of digital payment systems in SME's decision. This result finding is consistent with (Ifinedo, 2012). The results indicate that SMEs in Ghana has a higher level of top management support to use the digital payment system.

Environmental construct also found a critical construct to affect the use of the digital payment system (p-value=0.001). The result of the study found consistent with previous studies of (Igudia, 2017; Xena & Rahadi, 2019). The result reveals that society at large and competitor pressure has effects on the use of a digital payment system. Due to the growing trend of online buying, trade, and shift from one country to another, pressurize SMEs to use the digital payment system.

Interestingly, this study tested the effects of the use of the digital payment system on SME's performance in developing countries more profoundly in Ghana. The little construct available in existing literature related to effects of the digital payment system on SME's performance, even though the other technologies' effects were tested, such as the adoption of social media on SME's performance. Though, most of the scholars used constructs to assess the intention of the use of the digital payment system such as (Özkan et al., 2010; Sidek, 2015). Henceforth, the contribution of this study includes the positive effects of using the digital payment system on SME's performance. The result of the study found consistent with (Scott et al., 2017).

## 6. CONCLUSION

This study examined the effects of the use of the digital payment system on SME's performance in developing countries, more specifically, in Ghana. The findings of the work proposed that the use of a digital payment system has a significant effect on SME's performance with a 0.676 coefficient. This scholarship recommended that use of digital payment system enable SME's operating in countries to compete globally, satisfy customers, make stronger the relationship between suppliers, customers, trade partners, and government. Moreover, this article assists the SME's owners and executive to increase the use of digital payment systems in the future in order to further improve the

relationship with stakeholders. Besides, the proposed model allows the executive and managers to comprehend the importance of the use of the digital payment system in the country.

## 7. RESEARCH LIMITATION AND FUTURE STUDIES

This study dedicated to developing countries, more specifically Ghana, and Limited factors employed in the study under each construct. It can be considered the limitation of the study. This study employed an online survey to accumulate the data; field surveys should be used in upcoming studies. Moreover, future studies may employ the effect of governmental support in environmental construct. Also, the mediating effects of the use of the digital payment system can be tested. Moreover, this work can be carried forward to product and service-based companies separately. The moderating effects of environmental turbulence can be employed.

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