

Digital Transformation in the Banking Sector: Evaluating Continuance Usage Intention

Comfort Adebi ASAMOAH

*Tomas Bata University in Zlin, Zlin, Czech Republic
Asamoah@utb.cz*

Alena KLAPALOVÁ

*Tomas Bata University in Zlin, Zlin, Czech Republic
Klapalova@utb.cz*

Takyi Kwabena NSIAH

*Tomas Bata University in Zlin, Zlin, Czech Republic
Takyi@utb.cz*

Abstract. *Many businesses, including the banking sector, have been impacted by the spread of digital technology to change their business plans, procedures, goods, and services to better serve their clients and enhance their operations. Most crucially, because digital technology platforms enable new business models, traditional product and service creation are no longer necessary. Additionally, the institution is creating operational strategies through digital transformation to help it successfully compete and adjust to the new working environment. Customers currently access financial products and services through automated teller machines, internet banking, and mobile banking. Employing the quantitative research approach, this study seeks to analyze the nexus between perceived usefulness, perceived self-efficacy, perceived ease of use and continuance usage intention towards digital banking services. Empirically, the Smart PLS approach was utilized to examine the relationship between the antecedents (perceived self-efficacy and perceived ease of use) and continuance usage intention towards digital banking service, through the intervening impact of perceived usefulness. 487 data points were collected from customers across the various regions in Ghana. The results suggest that perceived self-efficacy and perceived ease of use have a favourable impact on continuance usage intention towards digital banking services. Most importantly, perceived usefulness emerged as a favourable mediator on the perceived self-efficacy - continuance usage intention relationship as well as perceived ease of use – continuance usage intention affiliation. This study is not only providing beneficial theoretical implications for digital transformation research and the enhancement of continuance usage intention towards digital banking services. It also creates an awareness of the contribution of perceived self-efficacy and perceived ease of use towards digital banking services continuance as well as providing guidelines on the need to concentrate on investing in digital technologies within the banking sector. Further, the survey helps organizations reconsider their digital expertise when designing digital banking service platforms.*

Keywords: Digital transformation, Post-acceptance model, Continuance usage intention, Digital banking service, Perceived self-efficacy, Perceived usefulness, Perceived ease of use.

Introduction

Every element of life has been impacted by the current trend of technological breakthroughs, customer expectations (Teece, 2019) and satisfaction (Kim, 2012). Owing to these, digital transformation has become an essential strategic requirement for businesses globally given the quickly changing business environment. Organizations are adopting new ways of conducting

business to meet these demands (Diller et al., 2020; Khin, & Ho, 2019) to maintain a competitive edge, improve operational effectiveness, and spur company expansion (Chiarini, 2021). The rapid advancement of new technology and the convergence of various trends are impacting the way banks function and serve the requirements of their customers. In particular, digital banking services have immensely grown (Bankrate, 2023), as the banking institution greatly held unto digital transformation in its early stage. As a result, the percentage of the world populace utilizing digital banking services keeps increasing at an increasing rate. With just some clicks on the browser, automated teller machines, or mobile applications (Le et al., 2023), consumers are capable of accessing a wide range of financial services including payments of goods and services, opening of accounts, transfer of money among others, requesting of account statements as well as investing in investment portfolios (Imerman, & Fabozzi, 2020).

To begin with, digital banking services (DBS), an alternative to traditional banking services provide a variety of services on digital platforms that improve user experience with simple and practical features (Lim et al., 2019). Moreover, digital banking offers appreciable benefits to both the banks as well as customers. For instance, customers access convenience and simple products and services (Le et al., 2023), cost and time saving (Skinner, 2014), and gain access to multiple communication channels (Verhoef et al., 2021). Also, banks incur lower expenses, gain the capacity to serve simultaneously a larger group of customers, increase income, enhance business performance and improve operational effectiveness (Le et al., 2023; Diener, & Špaček, 2021). Accordingly, Wewege and Thomsett (2019) opine banks and customers can exchange information, receive services and carry out transactions. Considering the significant impact of digital banking services towards bank's financial and non-financial performance (Lim et al., 2019), continued usage will sustain the success of the industry.

Continuance usage is a crucial objective for businesses in the competitive markets of digital technologies to guarantee profitability and growth in addition to new client acceptance (Bhattacharjee, 2001b). Since it gives businesses a competitive edge and long-term sustainable success (Wang et al., 2019), the continuity intention has a bigger impact on the long-term survivability of digital innovations than bringing in new clients (Ding, 2019; Thong et al., 2006; Bhattacharjee, 2001a). Hence, organisations typically want to guarantee sustained use, recurring use, or allegiance to a specific service over the long run (Bhattacharjee 2001b). The reason has been that there is a tendency for people to lose interest in technology after obtaining some experience. This will lead to lower usage and may even eventually become obsolete. From the perspective of Thong et al. (2006), when this occurs, businesses which created and invested in the technology will have to deduct the sizeable costs associated with creating and executing it. Though extant literature has placed a great deal of emphasis on digital banking services, little is known about the factors that impact its continuance usage, especially in developing nations like Ghana.

Perceived self-efficacy is a psychological predictor of technology. It is psychological as it emanates from the mind of a person or an individual's mental and emotional state. When individuals are mentally positioned to exploit the possibility of technology related to digital banking services continued usage intention is apparent. Moreover, adopting digital banking services based on the certainty that one is competent and equipped to utilize the platform as well as the view that the process of using digital banking services may be less complicated, requiring less effort without recognizing the benefits (perceived usefulness) may not necessarily guarantee continued usage of the digital banking services. Hence, to ensure continuance usage intention towards digital banking services, perceived usefulness may act as an intermediary, a link that is

scarcely assessed in prior literature. Notwithstanding the dual role of self-efficacy on technology adoption – barrier and enhancer, limited experimental papers have explored its effect on the continuance usage intention of digital banking services. Thus, empirical research on the impact of self-efficacy on perceived usefulness and user's post-adoption intention in the context of digital banking services as well as the intermediary role of perceived usefulness on the affiliation between self-efficacy and post-adoption of digital banking services is still in its infancy.

By unravelling the complex relationships between perceived self-efficacy, perceived ease of use, perceived usefulness and continuance usage intention towards digital banking services, this research aims to make significant contributions to both academia and practice. Also, by establishing the mediating role of perceived usefulness, we hope to offer a thorough understanding of how efficient and effective digital banking services can enhance the continued use of digital banking services towards the profitability and growth of banks' performance amid the constantly changing expectations of customers and technology. Moreover, organisational leaders looking for useful guidance on how to manage challenges regarding digital banking service provision to sustain such services as well as customers seeking to explore convenient digital banking services in this digital transformation age might benefit from our findings. Leaders can create digital service platforms that are easy to use and beneficial as well as strategies to improve the service, which will improve performance and competitiveness, by understanding the mediating function of perceived usefulness.

Literature review

Perceived self-efficacy, perceived usefulness and continuance usage intention

Self-efficacy refers to how convinced a customer is of his or her ability and competence to use technology to fulfil digital banking services. It encompasses the conviction that one has the skills and aptitude to complete particular activities (Bandura, 1977). Moreover, it is believed to affect not only an individual's degree of persistence and effort on a given activity, but also their specific choice of activities and behavioural environments (Zhao et al., 2005). According to Xu et al. (2017), self-efficacy is considered a user-related aspect that facilitates new technology acceptance. Digital banking services are useful in everyday activities but it necessitates the ability to utilize such technology, where users can navigate the platforms. Individuals who have higher levels of self-efficacy tend to act more positively and efficiently, accomplish more goals and may have less trouble using digital banking services. Hence, people who have high self-efficacy expectations for successful usage of digital services will approach it, while those who have low expectations will avoid it (Wood, & Bandura, 1989). Better still, self-efficacy is a precursor of direct or personal experience. Therefore, as people are more confident about their capacity to use digital banking services, continuous usage becomes inevitable. Further, considering how significant digital banking services are to stakeholders, individuals who are capable of utilizing them will not hesitate. Based on the above inference, the following hypotheses were formulated:

H1_a: Perceived self-efficacy impacts perceived usefulness positively.

H1_b: Perceived self-efficacy impacts continuance intention positively.

Perceived ease of use, perceived usefulness and continuance usage intention

Perceived ease of use is the degree to which customers think information systems are simple to use (Davis, 1989; Lee, & Kim, 2021). In the context of digital banking, perceived ease of use represents

the degree to which users believe utilising digital banking services requires less effort and how simple they find the process is known as perceived ease of use. Customers are highly expected to be persuaded by and make use of digital banking services when they believe it to be easy to use. Moreover, prior studies indicate enhancing the usability of digital banking services can be achieved by making them easier to use (Ferreira et al., 2023; Leon, 2018; Lin, & Chang, 2011). Rogers (1995) opined the ability of customers to grasp the usage of products increases the probability of products gaining prominence in the market. Accordingly, since users don't need to spend a lot of time or effort connecting to and using mobile apps after they are first adopted, perceived ease of use can still be considered a significant factor for continuous usage intention (Ferreira et al., 2023; Lee & Kim, 2021). In South Korea, a study conducted by Lee and Kim (2021) using 511 railway mobile apps revealed that perceived usefulness and continuance usage were directly and significantly influenced by perceived ease of use. Ferreira et al. (2023) investigated the determinants of continuance intention to use mobile self-scanning applications in retail. The results after analyzing 217 data points collected from mobile self-scanning application users in Portugal and using partial least square structural equation modelling revealed that perceived ease of use positively impacts perceived usefulness. Based on the argument above, the following hypotheses were outlined:

H2_a: Perceived ease of use impacts perceived usefulness positively.

H2_b: Perceived ease of use impacts continuance intention positively.

Perceived usefulness and continuance usage intention

The phenomenon of “perceived usefulness” describes the extent the degree to which people think using a specific system or platform would increase their performance and require no physical or mental labour (Davis, 1993, p. 477). Also, perceived usefulness explains the degree to which individuals believe digital banking services are efficient and offer valuable benefits. In simple terms, perceived usefulness is an extrinsic stimulus that individuals expect to derive during the engagement of an activity. It also acts as the positive outcome people are more likely to receive when they perform an activity. Prior studies postulate that the higher the expectation of a favourable outcome regarding an engagement, the more likely individuals will be willing to engage in that activity (Jo, 2023; Lee, & Kim, 2021; Davis et al., 1992). Considering the satisfaction individuals derive from utilizing digital banking services in terms of time cost saving, and convenience (Cho, & Jeon, 2023; Lee, & Kim, 2021; Ohk et al., 2015), continuance usage intention is probable. Further, the PLS-SEM was employed to analyse 437 data collected from consumers in South Africa. The outcome of the study indicates that perceived usefulness positively impacts continuance usage intention (Maduku, & Thusi, 2023). Also, Jo (2023) investigated the understanding of the key antecedents of users' continuance intention in the context of smart factory. Utilising 167 samples from South Korea, the findings demonstrated that perceived usefulness is positively and substantially affiliated with continuance usage intention. Moreover, the results of a study conducted in South Korea by Lee and Kim (2021) employing CB-SEM suggested that perceived usefulness has a satisfactory effect on continuance usage intention. Also, perceived ease of use positively impacted perceived usefulness and continuance usage intention. Lastly, perceived self-efficacy moderated the relationship between convenience and perceived usefulness; and interactivity and perceived usefulness. Therefore, the following hypotheses emerged:

H3: Perceived usefulness impacts Continuance usage intention positively.

H3_a: Perceived usefulness mediates the affiliation between perceived self-efficacy and continuance usage intention.

H3_b: Perceived usefulness mediates the affiliation between perceived ease of use and continuance usage intention.

Conceptual framework development

While the direct impact of perceived usefulness and continuance usage intention is firmly grounded in prior literature, the direct effects of perceived self-efficacy and perceived ease of use and continuance usage intention are partially dealt with. Hence, this study proposed a mediating impact of perceived usefulness on the later affiliation as depicted in figure 1 below. Stated differently, perceived usefulness serves as a means of translating the positive effects of perceived self-efficacy and perceived ease of use into quantifiable improvement towards continuance usage of digital banking services.

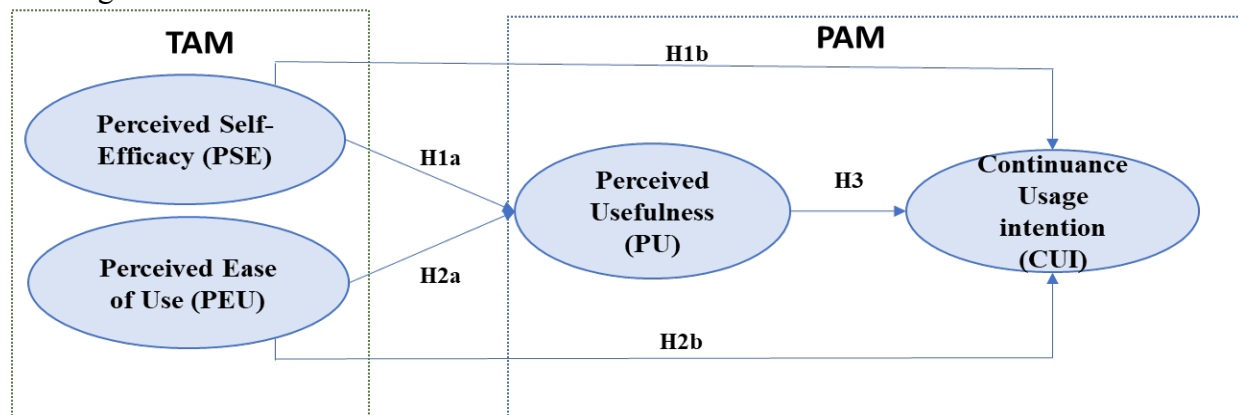


Figure 1. Conceptual framework

Source: Authors' own research.

Methodology

Data collection, and sampling

The quantitative technique was used to accomplish the research goal, with an emphasis on gathering data from clients who make use of digital banking services throughout Ghana's several regions. The participants' surveys were used to collect quantitative data. Perceived self-efficacy measurement, the degree of perceived utility and perceived ease of use initiatives, and the intention to continue using digital banking practices were all gathered by the study. 487 customers constituted the final sample. To guarantee enough responses for a thorough analysis, the sample size was established using statistical power analysis (Faul et al., 2009). The research employed random sampling methods. This was to help reduce bias in selecting participants for the investigations. By providing their informed consent, participants ensured their safety and privacy. All data was kept private and used exclusively for scholarly research.

Measurement of Instrument

Questionnaires were utilized to gather the data for the study. The total number of questionnaires were seventeen (17). The questionnaire was divided into two two sections, where section A gathered data about the respondents' demographic profile and section B addressed the independent and dependent factors. Included on the demographic profile were gener, age, and level of education.

The study utilized the seven-point Likert scale to measure the variable ranging from strongly disagree to strongly agree. While perceived usefulness was measured using 3 items (PU1 – PU3) adapted from Venkatesh, Thong, Chan, Hu, and Brown (2011), Perceived self-efficacy was measured with four items (PSE1 – PSE4) developed by Osswald, Wurhofer, Trösterer, Beck, and Tscheligi (2012). Further, perceived ease of use (PEU1 – PEU3) was measured using the questionnaires developed by Henderson and Divett (2003) and Continuance usage intention toward digital banking services (DBS1 – DBS3) were evaluated utilizing 3 items adapted from Kim (2012).

Data Analysis

To investigate the hypotheses, we utilized the Partial Least Square Structural Equation Modeling (PLS-SEM). Several studies attest to the popularity of PLS-SEM in management research and its capability to work well with both simple and complex models (Aftab et al., 2021; Bhatia, 2021; Hair Jr et al., 2020; Hair Jr, Matthews, et al., 2017). Moreover, PLS-SEM offers several choices for assessing the reliability and validity of a scale (Hair Jr, Hult et al., 2022; Henseler et al., 2015). PLS-SEM analyze data in two steps. The first step is dedicated to the measurement model which deals with the reliability and validity of the indicators. With regards to reliability, the study utilized both the Cronbach Alpha and the composite reliability index. According to the rule of thumb, a Cronbach Alpha and composite reliability index of 0.708 is required for the reliability of constructs to be achieved (Hair et al., 2017). Further, convergent validity was evaluated using average variance extracted which value should be greater than 0.50 to be successful. Lastly, the discriminant validity was measured utilizing the Fornell-Larcker criterion, most widely used methods for examining the discriminant validity of measurement models, which stipulates that a construct's square root of the average variance it extracts must be larger than the correlation it has with any other construct.

Concerning the significant paths, a confidence interval of 95 per cent was utilized to determine the significance level of the study such that any connection with P- values greater than 0.05 as well as a connection with a T-statistic less than 1.98 was rendered insignificant.

Results and discussion

Demographic profile of respondents' Analysis

To begin with, the respondents' demographic information was evaluated utilizing frequencies and percentages. 321 of the total participants were men, and the remaining participants were women. In terms of age, over eighty per cent were young people between the ages bracket 25 - 44. More than 70 per cent of the respondents had a bachelor's education, while 120 respondents had Higher National Diploma (HND) certificates. Also, while about 67 per cent of the respondents indicated they have five to ten years working experience, 98 respondents have worked between 11 - 19 years and the rest have 20⁺ years working experience.

Reliability and convergent validity Analysis

To proceed to analyze the structural model, the measurement model which includes the validity and reliability must be assessed. Therefore, the Item loadings, composite reliability and Cronbach Alpha were employed to measure the reliability of the variables. The results in Table 1 demonstrate that the internal consistency of the study variables was achieved as each reliability coefficient was greater than 0.70, the threshold obtaining reliability (Hair Jr, Hult et al., 2017). For instance, the reliability values examined by using Cronbach's Alpha ranged from 0.753 – 0.848. Also, the

composite reliability values reported were within the range of 0.843 – 0.929. Moreover, the convergent validity was measured utilizing the average variance extracted values (AVE) and indicator reliability. Prior studies suggest that AVE values greater than 0.5 are desirable as illustrated Table 1. Considering the indicator reliability, an outer loading greater than 0.708 or higher is required (Hair Jr, Hult et al., 2017). Hence, the convergent validity of the variables is achieved.

Table 1. Measurement of convergent validity and reliability

Variables	Proxy	Cronbach Alpha	Composite reliability	Average variance extracted
Continuance Usage Intention	DBS	0.812	0.889	0.727
Perceive Ease of Use	PEU	0.775	0.899	0.816
Perceived Self-Efficacy	PSE	0.753	0.843	0.574
Perceived Usefulness	PU	0.848	0.929	0.867

Source: Authors' own analysis.

Discriminant validity

Discriminant validity is defined as an indicator's loading on its assigned construct being greater than all its cross-loading with other variables. It evaluates how well the variable reflects contrast through empirical observation. The Fornell-Larcker criterion was employed to evaluate the discriminant validity as it is widely used and accepted empirically. From Table 2, the boldened figures represent the square root of the AVE of each variable and these values are greater than the variables' highest correlation with other variables. The square root of the variables DBS (0.853), PEU (0.903), PSE (0.758) and PU (0.931) suggest that the variables have obtained good discriminant validity.

Table 2. Fornell-Larcker

	DBS	PEU	PSE	PU
Continuance Usage Intention	0.853			
Perceived Ease of Use	0.752	0.903		
Perceived Self-Efficacy	0.601	0.207	0.758	
Perceived Usefulness	0.434	0.265	0.371	0.931

Source: Authors' own analysis.

Evaluation of R square and Q square

In evaluating the predictive accuracy of the study's model, the R square was employed. As illustrated in Table 3, the endogenous variable (perceived usefulness and continuance usage intention) recorded R² values of 0.165 and 0.781 respectively to indicate that the model has achieved a good predictive accuracy based on the rule of thumb of Hair et al. (2017). Also, the Q² value of 0.556 suggests that the predictive relevance of the model is good.

Table 3. Assessment of R square, R square adjusted and Q Square

	R square	R square adjusted	Q square
Perceived usefulness	0.165	0.161	0.137
Continuance usage intention	0.781	0.779	0.556

Source: Authors' own analysis.

Discussion

Table 4 and Figure 2 illustrate the outcome of the direct affiliation among the variables Perceived Self-Efficacy (PSE), Perceived Ease of Use (PEU), Perceived Usefulness (PU) and Continuance Usage Intention (DBS). The estimates, standard deviations, t-statistics, and p-values are shown in the table. An estimated value of 0.331 and a t-value of 5.623 indicate a favourable association of the route coefficient from PSE to PU (H1_a), indicating a high degree of reliability for the estimate. The significance level of 0.000 indicates the statistical material effect. Again, the results that the relationship between PSE and DBS (H1_b) is significant, with a t-value of 10.395 and a coefficient value of 0.429. This is supported by a p-value of 0.000. Hence, the relationship between PSE and DBS is very strong. The findings of this study are novel as the direct impact of perceived self-efficacy on perceived usefulness and continuance usage intention is rare in prior literature.

Further, with a coefficient value of 0.192 and a t-value of 5.949, the relationship between PEU and PU (H2_a) emerged to be positive. The result of the p-value of 0.000 validates that PEU and PU have a significant correlation. Also, the path from PEU to DBS (H2_b) has a positive and significant direct effect with an estimate of 0.620. The t-statistic of 13.217 denotes high reliability, and the p-value of 0.000 confirms the statistical significance. Thus, there is strong evidence to confirm the inference that perceived ease of use has a positive and significant direct impact on continuance usage intention towards digital banking services. These results are supported by prior studies including Lee and Kim (2021) in South Korea and Ferreira et al. (2023) in Portugal.

On the part of the nexus between perceived usefulness and continuance usage intention (H3a), the path coefficient has a positive connection with an estimated value of 0.433 and a t-value of 8.847 indicating that the approximation is highly reliable. The statistically significant impact is proved by the p-value of 0.000. The findings support the work of Al Amin, Muzareba, Chowdhury, and Khondkar (2023) investigation in Bangladesh which suggested that perceived usefulness favourably improves mobile payment application continuance usage and the outcome of the study of Lee and Kim (2021) in South Korea.

Table 4. Direct Effect

Hyp.	Path	Beta	Std. Dev.	T - Statistic	P-value	Decision
H1 _a	PSE->PU	0.331	0.059	5.623	0.000	Accepted
H1 _b	PSE->DBS	0.429	0.041	10.395	0.000	Accepted
H2 _a	PEU->PU	0.196	0.033	5.949	0.000	Accepted
H2 _b	PEU->DBS	0.620	0.047	13.217	0.000	Accepted
H3	PU->DBS	0.433	0.049	8.847	0.000	Accepted

Source: Authors' own analysis.

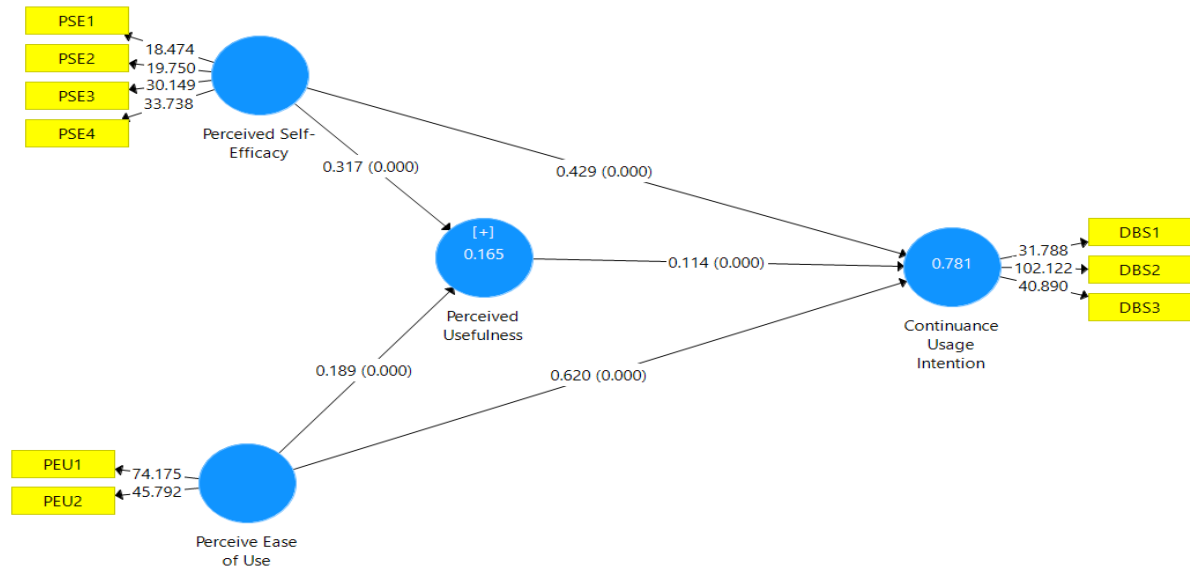


Figure 2. Structural model: direct and indirect paths

Source: Smart PLS bootstrapping output.

Lastly, an analysis was conducted regarding PU's mediating connection between PSE and DBS (H3_a) and the relationship between PEU and DBS (H3_b) as shown in Table 5 and Figure 2. The results showed that PU has a mediating influence on the variables. The outcome confirms that PSE has an indirect and significant correlation with DBS when PU was introduced as a mediating effect. Similarly, the investigation confirmed a PU mediating connection between PEU and DBS with a t-value of 3.327 and a p-value of 0.001.

Table 5: Indirect Effect

Path	Beta	Std. Dev.	T - Statistic	P-value	Decision
PSE->PU->DBS	0.036	0.011	3.282	0.000	Accepted
PEU->PU->DBS	0.022	0.006	3.327	0.000	Accepted

Source: Authors' own analysis.

Conclusion

The aim of this study was to investigate the relationship between perceived self-efficacy and perceived ease of use and continued intention acceptance of digital banking by means of the mediating effect of perceived usefulness. The study included customers of commercial banks in Ghana, a developing country. The distributed questionnaire received responses from 487 respondents in total. Selecting the respondent involved taking into account their level of familiarity with digital banking. The use of the Smart PLS 3 allowed for the development of the hypothesis. The results showed that PSE significantly impacted PU. Likewise, PEU possessed a tangible connection to PU. PU did have a strong direct connection to DBS. PU's assignment as a mediating structure on the relationship between the three variables was successful. The investigation's findings have provided sufficient insight into PSE, PEU, PU and DBS in Ghana and other emerging states' banking sectors. In addition, the paper offers some management implications and

recommendations for financial institutions wishing to enhance their performance through digital transformation.

Managerial policy

The few previous studies on the relationships between perceived self-efficacy, perceived ease of use, perceived usefulness and digital banking have left gaps that this study covers. The empirical results of the study validated that digital innovation provides financial institutions with multiple opportunities to improve their products and services, which is translated into performance in the long run. Managers should help design user friendly platforms that will support ease usage of customers based on their efficacy. The findings of this study suggest that managers considering digital banking services should reflect how to provide adequate education on how their platforms are utilized to increase continuance usage. Although many financial institutions have to embrace digital innovation, realising the potential to explore opportunities to upgrade the skills of customers towards the usage of their services and to focus on providing platforms that enable usage friendly to improve customer experience will complement customers continuance usage intentions.

Limitations and further research

This study contains gaps that offer opportunities to support additional research. First, cross-sectional data may compromise a thorough analysis of the data to identify the strategies required in the digital innovation, hence, a longitudinal data is better in this case. Second, collecting data from a single country (Ghana) and basing analysis on customers opinions increases the possibility of bias and reduces generalizability. It is feasible to conduct research in other countries and with a diverse range of respondents from different divisions inside the firm in the future.

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Appendix

Table 3. Variable of measurement

Variables	Items
Perceive Usefulness	PU1 - Information provided by the digital banking services platforms is highly valuable
	PU2 - The platforms allow me to engage in many banking activities more efficiently
	PU3 - Overall, I find using the DBS platforms to be useful in my daily life
Perceive Ease of Use	PEU1 - It is easy to activities done using a digital banking service
	PEU2 - It is easy to get what you want from digital banking service platforms
	PEU3 - It is easier to track your banking activities
Perceived Self-Efficacy	PSE1 - It is easy to complete a task using digital banking platforms if there is no one around to tell me what to do
	PSE2 - I can complete a task using digital banking platforms if I could call someone for help if I get stuck
	PSE3 - I could complete a task using digital banking platforms if I had a lot of time
	PSE4 - I could complete a task using digital banking platforms if I had online assistance available
Continuance Usage Intention towards DBS	DBS1 - I would like to continue to use the digital banking services platform
	DBS2 - I will continue to use digital banking service platforms a lot in the future
	DBS3 - I will encourage the people around me to use digital banking services