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Communicating Banking Cyber-security Measures, Customer Ethical Concerns, Experience, and Loyalty Intentions: A Developing Economy's Perspective

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ABSTRACT

AI technology-based banking services development has disrupted the way people participate in banking transactions. It has created easier and faster banking transaction possibilities with the use of electronic gadgets. However, ethical concerns about these applications have also been amplified together with the need for management communication of safety features and protocols for customer information protection, and redress when infringements occur. The study was an attempt to highlight how AI-enabled banking services safety communication affects customers' ethical concerns and how the concerns shape their banking services value perception, attitude, and loyalty intentions. A conceptual framework based on the generic AI technology, ethical concerns, and loyalty intentions was used as a basis for this study. It attempted to test the link between management communication, ethical concerns, satisfaction/dissatisfaction, and customer loyalty to AI-based banking services in a developing economy context. The study used three theoretical grounding bases to empirically test the proposed hypotheses. The results analysis followed Structural equation modeling (SEM). The results confirmed the impact of management communication on customers' ethical concerns of security, privacy, diversity, and discrimination, and the positive influence of privacy and security on satisfaction/dissatisfaction. However, the relationship between diversity and discrimination concerns with customer satisfaction was not confirmed. Lastly, customer satisfaction was proven to impact their loyalty intentions.

Keywords: Cyber-security, Communication, Ethical Concerns, Customer Satisfaction, Loyalty
JEL Classifications: M31; M37; 018; O35

1. INTRODUCTION

Today's world is characterized by rapid growth in the use of digital technology (Teshabaeva and Kodirova, 2023). Digital technology finds application in areas such as health (Bhambere et al., 2021), and tourism (Kalia et al., 2022), with digital banking (DB) services as one of the latest contributions and most notable innovation (Sardana and Singhania, 2018; Alzoubi et al., 2022; Sutikno et al., 2022). DB is powered by artificial intelligence (AI) (Yeo et al., 2022). The digitalization of the banking business means that the traditional services offered by banks are now offered through digital means (Kaur et al., 2021). Kaur et al, (2021) state that DB is expected to provide a convenient, easy, and secure way of carrying out banking services from the comfort of your home, any time, from your personal computer or laptop and using the bank's mobile app on your smartphone or tablet. However, DB services are very much prone to risk factors (Akartuna et al., 2022). Consequently, as DB evolves, so do customer concerns about information cyber-security (Sijan et al., 2022; Ghelani et al., 2022). Whenever cyber-security is discussed, issues like computer systems intruders, financial terrorism, security flaws, and breach detection come to mind (Ghelani et al., 2022). Concerns about the security of electronic banking systems result in reservations about the adoption and use of these online services (Sijan et al., 2022) and influence customers' satisfaction when using digital technology (Muhtasim et al., 2022). For organizations and

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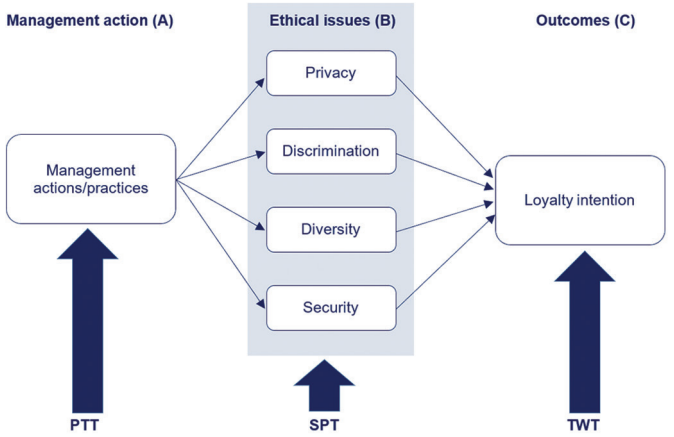
academics, it is imperative to understand both the intensity of the risk factors (Rodríguez-Espíndola et al., 2022), that influence customer satisfaction for digitalized banking services and products to facilitate informed management actions (Grima et al., 2021; Kaur et al., 2021). The novelty of digital banking (Nel and Boshoff, 2021), the increasing contribution of digital technology to banking services (Tsindeliani et al., 2022), and the inherent risks (El-Haddadeh et al., 2023) in its application makes it an interesting subject for further academic scrutiny. The rapid digitalization of banking by developing countries (Khan et al., 2023) makes a good case for using a developing country as a context for further investigation (Egard and Hansson, 2023).

The digital banking industry is highly prone to Information systems (IS) security breaches from outside and inside (employee-related) organizations (Almeida et al., 2022). The increased importance of banking information security (Sharif and Ameen, 2020), and the continued suspicion that digital banking can result in other people stealing customer's money and information present serious trouble for organizations (Sharif and Ameen, 2020; Alzoubi et al., 2022). Customer concerns can create disabling barriers to the adoption of this novel business practice (Egard and Hansson, 2023). Some of the issues that concern customers and should also concern digitalized banking service businesses are management assurance and actions on cyber-security (Almeida et al., 2022), including the correct use of information, ensuring the security of customer data, protection and preserving private information from unauthorized access, disclosure and infringement, managing the risks related to confidentiality, integrity, and availability (Merkow and Breithaupt, 2014; Andrade et al., 2023), and the communication of safety precautions, features and protocols to customers (Mallinder and Drabwell, 2014). A plethora of studies have dissected the impact of threats inherent in the adoption or lack thereof of digital banking services created by management communication or lack thereof (Gilad et al., 2015; Telukdarie et al., 2023; Alzoubi et al., 2022). Some have emphasized specific concerns such as privacy concerns (Zubaydi et al., 2023), discrimination concerns (Pakhnenko and Kuan, 2023), and information security (Farid et al., 2023). Despite this growing body of work dealing with these and many other concerns, there remain gaps in the knowledge on the application of AI-based technology in the area of financial services marketing and ethical concerns (Mogaji and Nguyen, 2022). Many studies have only focused on one feature (Chatbox) of AI and ignored other innovations that it provides (Mogaji and Nguyen, 2022; Abdulquadri et al., 2021). There is, therefore, a lack of systematic, integrative, research-based view of concerns and tensions with digital banking technologies (Pomfret et al., 2020). Most studies have neglected to scrutinize the impact that the use of this technology can have the perceptions of risks and how these risks may in turn affect the adoption of the services rendered, especially, in banking services for a developing economy context. An exception is the Mgiba (2020) conceptual study of the impact of management practices in an AI-based business on ethical concerns and their influence on the adoption of these services. Figure 1 displays the proposed research framework based on Mgiba's (2020) study.

Further, there has not been any empirical study to validate or falsify the proposed model, hence the continued existence of the gap between ethics and electronic banking services (Stenseke, 2022). The conceptualization of the present study was an attempt to bridge that gap by subjecting the framework to empirical scrutiny, in the South African context using three theoretical lenses Virtue ethical theory (VET), Actor-network theory (ANT), and Flow theory. The study analyzes the influence of AI-based banking services managers' safety communication on customers' digital concerns, the impact of the concerns on satisfaction, and loyalty intentions. It specifies management communication which has been shown to heavily impact the perception of risks, ethical concerns, customer satisfaction levels, and the adoption of DB services in different contexts. By interrogating management communication and their influence on customer's perceptions and ethical concerns, it fills the gap in the literature on understanding the intensity of the ethical risk factors that influence customer satisfaction for digitalized banking services and products in a way that facilitates informed management cyber-security communication strategy (Kaur et al., 2021). This research contributes to marketing theory by applying the three theoretical lenses to understand possible customer responses to communicated security assurance by AI-based banking organisations. It overcomes some limitations of prior studies that overemphasized technology adoption from the organisation's perspective instead of reflecting on the interplay between the DB technology and customers' concerns and responses (Quach et al., 2022). It, therefore, also adds to the literature on customer satisfaction in the context of the banking sector in the digital age by taking a practical view of the situation of the banks in South Africa. The study tests the proposed framework using real-life situations. The research findings have practical implications for risk managers, banking practitioners, policymakers, and marketing personnel, which according to Kaur et al., (2021) is a worthwhile goal. Other possible offshoots of the study are further discussed under study implications. The rest of the article is organized in the following way. The first part deals with the literature review and hypothesis building. The second part deals with the methodology of the study. The third part covers data analysis,

Figure 1: Mgiba model



Source: Mgiba (2020)

results discussion, study implications, limitations of the student, and concluding remarks.

2. LITERATURE REVIEW

The study utilized these three theories to create a conceptual model that relates management cyber-security practice communication (CM), consumers' ethical concerns in the digital banking space, and how their concerns translate into subsequent attitudes and responses to digital banking technology services.

VET has been used in other contexts to understand the interaction of technology and ethics (Danaher and Saetra, 2022), which Ruth et al. (2023) refers to as cyber-ethics.

According to VET ensuring cyber-security is virtuous (Nakato et al., 2022) because it factors in the moral implications of technology deployment (Caram et al., 2022). This theory has been utilized to understand the interaction of AI technology and human rights (Morán-Reyes, 2022), Twechnology and ethics (Danaher and Saetra, 2022; Stenseke, 2022). Virtues of cyber-security components of safety, anti-discrimination, ensuring diversity, and improving the enjoyment perception of customers were used to understand cyber-security.

ANT explains consumption behaviors and people's interactions with inanimate objects such as computers (Mariani et al., 2022). Actor-network theory (ANT) actor is conceptualized as the source of an action regardless of its status as a human or non-human. Cresswell et al, (2010) argue that this is a radical notion in that it contests that inanimate things (e.g., such as technology) can also have agency. The theory has enabled research on the implementation of new technology in different settings. For instance, Bruni (2005) used ANT to explore the use of electronic clinical records in a healthcare setting and the role of infrastructures and virtual environments on patient usage of technologies. Furthermore, Van Oost and Reed (2011) used an actor-network approach to identify the social and ethical dimensions of the increased use of robots as companions (Mariani et al., 2022). The present investigation interrogated the interaction of management communication of cyber-security practices, DB customers' perception of risks, and their responses.

The last theory used is the FLOW theory to investigate the impact of customers' responses. FLOW deals with customer experiences and possibilities of their continued use of any technology (Hsu and Lin, 2023). It has been used in many other contexts similar to this one. For example, Hsu and Lin (2023) apply it to the adoption of live streaming services. Chang and Chiang (2022) have applied it to virtual reality technology use in tourism. According to Zarei et al. (2022), FLOW can also be utilized to strengthen customer relationships. Constructs of customer experience and loyalty/disloyalty are utilized to propose the new model (Zhao and Khan, 2022; Zhang and Abd Rahman, 2022). Together these theories contributed all the constructs of importance in this study and the hypothesized relationships are shown in Figure 2.

The use of the three theories finds justification from many sources in different contexts such as (Lappeman et al., 2023). This is also in line with other similar studies that investigated technology adoption such as the use of VET (Ruth et al., 2023), ANT (Mariani et al., (2022), and the use of FLOW (Kaondera et al., 2023). Past researchers have noted that a single theory is not able to consistently offer superior explanations or behavioral predictions (Kroeper et al., 2022; Vergauwe et al., 2022). An integrative approach that synthesizes multiple perspectives and empirical findings overcomes the tendency to maintain preconceived notions embedded within a single domain (Pizzo et al., 2022).

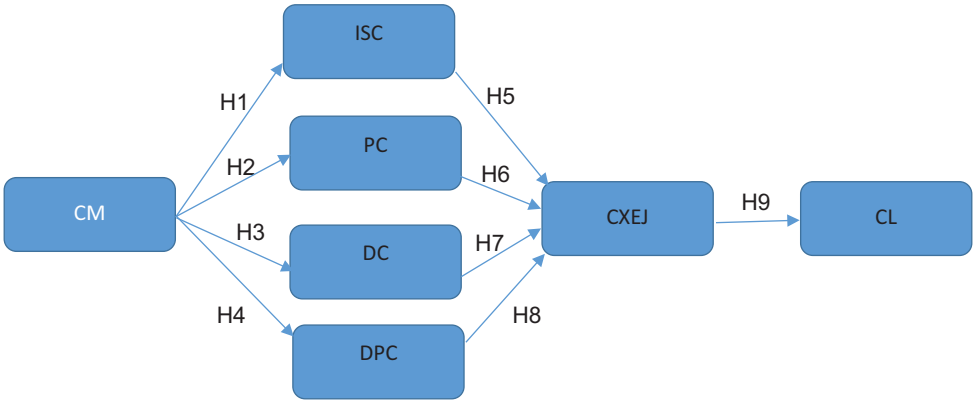
It was hoped that by synthesizing these theories' constructs, their validity and applicability could be extended to the banking cyber-security contexts (Calder et al., 2023). Lastly, the use of more than one theory was expected to lead to an extension of these theories and the possible development of one that combines constructs from all of them.

2.1. Management Communication (CM) and Ethical Concerns in General

The most important task of management is to manage resources (AlHamad et al., 2022). According to Tipton and Krause (2007) and Merkow and Breithaupt (2014) management actions should focus on managing the various risks that threaten data confidentiality, integrity, and availability, thus ensuring cyber-security (Andrade et al., 2023). According to Hasan et al. (2023), cyber-security involves the prevention of economic damage, avoiding security deficits, and reducing the number of possibilities of cyber-attack. Managers, therefore, need to strengthen cyber security and prevent cyber-attacks (Utami and Damayanti, 2020), which Rodríguez-Espíndola et al. (2022) refers to as risk-management. For the present study management actions mean only those actions or systems in place for organizations' technology-based business activities which should include ensuring the correct use of data (Andrade et al., 2023), protecting the information assets of companies from any unauthorized access, disclosure, or infringement (Ghazvini et al., 2018), together with the effective communication of their technology cyber-security features and protocols to their target audience. Issues that should get special communication attention are the organisation's practices relating to opt-in and informed consent for the use of the information for specific purposes, organisations' responsiveness under conditions of uncertainty, and any other information related to customers' ethical concerns (Arthur and Owen, 2022). This is a very important aspect when attempting to make an AI-enabled business offer stand out (Surti et al., 2023). Proper and timely communication can make an organsation stand or fall (Alshurideh et al., 2023). The communication to customers and potential customers should be aimed at maximising business benefits. Pospisil et al. (2022) confirm that any security features must be communicated to customers to influence their perceptions. The present study deals with ethical issues arising from AI-enabled banking services.

These issues are present in any human-AI relationship (Beauchamp and Childress, 2019). AI systems receive updates from people who train them. By design, AI algorithms may contain mistakes that have unfavourable effects (Keskinbora, 2019) and present opportunities for fraud, deception, and abuse (Jin, 2018). For instance, sharing personal information might elicit significant

Figure 2: Proposed hypotheses



Source: Authors' own sources

negative reactions and emotions of betrayal (Shin, 2018; Song and Kim, 2021; Van Zeeland and Henseler, 2018). A breach of customer confidence can cause trust to decline and confidence to disappear (Ghosh et al., 2023). According to Wang and Liu (2019), views of information security and privacy and the trustworthiness of management are significantly correlated. According to Mgiba (2020), management decisions affect the ethical or unethical implementation of AI cybersecurity measures. Therefore, management responsibilities in the context of banking include the protection of consumer's personal information, transaction history, online performance, and the protection of information systems (Fay and Trenholm, 2019). Summarising from the above, there are four areas this study addresses on the impact of management cyber-security communication can evoke and they are: security concerns (ISC), privacy (PC), diversity concerns (DC), and discrimination concerns (DPC). It also addresses how these concerns can impact customers' value perceptions and their subsequent loyalty intentions to AI-based banking services.

2.2. Cyber-security Communication (CM), Security (ISC), and Privacy Concerns (PC) in the Digital Banking

Safety requirements are more crucial in the banking industry (Vinoth et al., 2022) because they have significant effects on resilience and business continuity (Kodym et al., 2020; Rodríguez-Espíndola et al., 2022). Many other studies confirm the same for online banking services (Ruth et al., 2023; Liu et al., 2022; Wang et al., 2022). Banking services involve customers sharing sensitive information that they would not like to be made available to any third party (Singh et al., 2023). When customers share their personal information with a banking service provider, the bank's activities may cause privacy issues, perceptions of discrimination, views of a lack of diversity, and emotions of vulnerability. Any perception or possibility of the leaking of that information (information insecurity) can produce devastating consequences (Chen and Yuan, 2022). It is, therefore a reasonable expectation for online banking services providers to ensure cyber-security for customers (Ghelani et al., 2022).

However, the best cyber-security features that remain unknown to customers lose their impact on customer perceptions (Limna et al., 2022), which can lead to them getting anxious and concerned about their online banking safety (Dutt, 2023). This can blunt the expected competitive advantage. Any cyber-security safeguards and protocols need to be communicated to beneficiaries and potential clients (George et al., 2023; Illikainen, 2023). This has been proven in many contexts such as online examinations (Semlambo et al., 2022), internet shopping (Faqih, 2022), sharenting-sharing of minor information by parents (Lavorgna et al., 2023). When organisations do not communicate their cyber-security measures and protocols, unintended perceptions of 'perceived cyber-insecurity and privacy risks' may result (Hanif and Lallie, 2021). The unintended perceptions have a significantly negative relationship with user self-disclosure (Rodríguez-Priego et al., 2023). It creates tensions among consumers (Vitak et al., 2023). Both Lappeman et al. (2023) and Quach et al. (2022) recommend that companies using AI-based platforms focus on easing security and privacy concerns which are the foundations of trust. If that is not in place, consumers can take action to protect their data which might include switching of service providers (Raddatz et al., 2023). Given the importance of communication of cyber-security features and protocols and the negative perceptions that may arise from lack of communication, this study proposes that:

H1: CM---ISC: Cyber-security communication has a positive relationship with customers' security concerns IN AI-based banking services.

H2: CM---PC: Cyber-security communication has a positive relationship with customers' privacy concerns in AI-based banking services.

2.3. Cyber-secure Communication, Diversity, and Discrimination Concerns (CM, DC, and DPC)

One of the issues identified by both Mgiba (2020) and Banks et al., (2023) was concerns of unfair treatment of different race groups, backgrounds, and cultures. In addition, recent studies have highlighted the issues of inclusiveness/lack thereof in the digital banking space (Drago et al., 2023; Amin et al., 2023). For online banking services, the trend can be manifest in interest rate decisions, and in decisions on whether to grant bonds and other loans or not etc. (Zhang and Rodgers, 2023; Paloheimo, 2023). Many incidences have shown that the concerns are not baseless and they can have devastating consequences for both customers and business. Examples are possibilities of high perceptions of risk (Chen and Yuan, 2022), geopolitical conflicts (Murinde et al., 2022), and perceptions of untoward discriminatory practices (Mpofu and Mhlanga, 2022). In a DB space, banks also require digital authetification (Wu et al., 2023).

The customer- disclosed information can bring about discrepancies in credit access to different population groups (Howell et al., 2023). Given the sensitivity of digital technology-based banking services, it is logical to state that issues of inclusiveness should be part of what banks offer and communicate to customers. Further, digital banking technology is capable categorising and dividing citizens into different social groups using biometric information (Kemppainen et al., 2023). This study therefore proposes the following for the SA context.

H3: CM---DC: Cyber-security communication has a positive impact of the perceptions of the lack of diversity in online banking services.

H4: CM---DPC: Cybersecurity communication has a positive relationship with feelings of discrimination in online banking services.

2.4. Privacy, Security, Diversity, and Discrimination and Customer Experience, and Loyalty Intentions (CXEJ and CL)

When customers have concerns about their privacy when engaging with organizations, their trust levels are impacted (Su et al., 2022; Tran and Nguyen, 2022; Plangger et al., 2023), and this affects their attitude toward a brand (Rana and Arora, 2022; Tan et al., 2022). Together, trust and attitude are powerful precedents of value perception after consumption (Roh et al., 2022), issues that are at the heart of customer experience evaluation (Riva et al., 2022). Both Su et al., (2022) and Johri and Kumar, (2023) confirm that risk influences consumers' overall value perception, attitude, and satisfaction. A link has been established between customer concerns, value perception, and how they experience the service (Chauhan et al., 2022), a point that was illustrated by other recent studies (Salehzadeh et al., 2023; Almaiah et al., 2022). It can, therefore be concluded that customer value perception directly affects customer satisfaction (Paulose and Shakeel, 2022). Further, customer experience and intention to continue to use (loyalty) are interrelated concepts (Quach et al., 2022). For example, customer satisfaction positively affects their loyalty intention (Aydin, 2022; Plangger et al., 2023). Both Azmi et al. (2023) and Lappeman et al. (2023) went further to show the link between ethical concerns, the impact on trust, customers' value perception (experience), and their loyalty intention. Customer loyalty involves their persistent continued usage intention of any service (Maroufkhani et al., 2022). Customer experience mediates loyalty (Zariman et al., 2022). Given the discussion, this study proposes the following hypothesis for AI-based banking services.

H5: ISC---CXEJ: Cyber-security concerns negatively impact customer satisfaction

H6: PC----CXEJ: Concerns about the breach of privacy impact customer satisfaction negatively

H7: DC----CXEJ: Perceptions of the lack of diversity negatively impact customer satisfaction

H8: DPC----CXEJ: Discrimination concerns negatively impact customer satisfaction

H9: CXEJ----CL: Customer satisfaction positively impacts their loyalty intentions.

The proposed hypotheses are schematically represented in Figure 2.

3. METHODOLOGY

Following Mogaji and Nguyen's (2022) example, the target participants were individuals who have bank accounts and the responsibility for deciding whether to adopt any technology-based banking services. To draw a representative sample of the adult online banking population, the participants were sought across different areas around Gauteng. The group consisted of financial service consumers with various levels of experience to ensure a diversity of views and experiences to enrich the data and subsequent findings (Ludwig et al., 2022). The study followed a non-probability convenient sampling method to collect the data through structured questionnaires which were sent to the participants. A five-point Likert-type scale (1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree) assessed each construct. The scales were adapted from a review of the extant literature, with a specific focus on the conceptual model development. The sources of the items are summarized in Table 1. The study reached a sample size of 302, which was deemed appropriate based on past research that investigated similar environments (Chellappa and Sin, 2005; Lappeman et al., 2023). Moreover, Malhotra (2015) supported this by suggesting a minimum of 200 respondents for problem-solving research studies that use Structural equation modeling for analysis.

3.1. Ethical Research Practice Issues

A consent form with a questionnaire that stated the study's fundamental objective was provided to the participants. Using that consent form, the authors certified that all of the information they had acquired would be used solely for the objectives of this study. Furthermore, it was guaranteed that all data would be kept entirely confidential and participants' anonymity was assured. In addition, the researchers obtained an ethical clearance certificate from a Johannesburg-based University and the protocol number is H23/05/22.

4. DATA ANALYSIS

The data analysis follows the normal approach of starting with the descriptive statistics before conducting the substantive analysis. The descriptive statistics results are displayed in Table 2.

Table 1: Constructs and sources table

Construct	Acronym	Source
Management communication	CM	Surti et al., 2023; Alshurideh et al., 2023; Pospisil et al., 2022
Security	ISC	Singh et al., 2023; Chen and Yuan, 2023.
Privacy	PC	Rodríguez-Priego et al., 2023; Vitak et al., 2023.
Diversity	DC	Drago et al. 2023; Amin et al., 2023; Zhang and Rodgers, 2023; Paloheimo, 2023
Discrimination	DPC	Wu et al., 2023; Howell et al., 2023)
Customer satisfaction	CXEJ	Plangger et al., 2023; Tan et al., 2022; Riva et al., 2022; Chauhan et al., 2022.
Customer loyalty	CL	Plangger et al., 2023; Lappeman et al., 2023; Maroufkhani et al., 2022.

Source: Authors' own sources

Reading from the summarized statistics in the table, the achieved sample size was 302. It was deemed sufficient after taking into account the Smart PLS analysis approach this study adopted. The Smart PLS analysis requires a minimum of 200 to provide good statistical power for analysis (Younus, 2023). The majority of participants were females, as shown by the 67.2% representation, followed by 32.1% of males. Reading from the table, it is clear that the people who participated in this study were mostly employed (at 87.7%), young adults (aged 26-30 years), and highly educated individuals (about 78.5% possessing degrees and higher diplomas). The black South African race group was the dominant group for the study. Lastly, the majority of the participants were the high earning individuals. These statistics should be factored in when targeting this segment and tailoring the advertisement messages.

4.1. Substantive Data Analysis Approach

The researchers used structural equation modeling (SEM), the analysis technique that measures constructs and simultaneously tests relationships between them (Goller and Hilkenmeier, 2022). Sobaih and Elshaer, (2022) state that SEM is suitable for analyzing the complex research models that are proposed as an estimation framework incorporating related theories and empirical data. This study employed the variance-based partial least squares SEM (PLS-SEM), which uses maximum likelihood estimation (German et al., 2022). It was selected over covariance-based structural equation modeling (CB-SEM) because it is prediction-orientated, variance-based, and effectively caters to small sample sizes (Guo and Hou, 2022). Because of its' predictor-specific nature, it allows for non-parametric results (Malhotra 2015). This approach was ideal for this study as 302 cases were used and the implications of the model were directed towards prediction accuracy (Malhotra, 2015; Lappeman et al., 2023). PLS-SEM also generates better construct reliability and validity and is best suited for composite-based models (Dash and Paul, 2021; German et al., 2022). It is also an ideal approach when the aim is to derive recommendations for practice. A two-step approach was adopted, in which, the proposed theoretical model first tested the outer model for reliability, convergent and discriminant validity, and, second, the inner model was evaluated for hypotheses testing (Sobaih and Elshaer, 2022).

Table 2: Descriptive statistics

Category	Sub-category	Frequency	Percentage
Gender	Male	97	32.1
	Female	203	67.2
	Prefer not to say.	2	0.7
	Total	302	100
Age	20-25	54	17.9
	26-30	122	40.4
	31-35	63	20.9
	36<	63	20.9
	Total	302	100
Employment status	Student	10	3.3
	Employed- Full Time	265	87.7
	Self-Employed	15	5.0
	Unemployed	9	3.0
	Prefer not to say	3	1.0
	Total	302	100
Education Level	None	0	0
	Matric	20	6.6
	Diploma	45	14.9
	Degree	79	26.2
	Postgraduate	158	52.3
	Total	302	
Race	Black	187	61.9
	White	59	19.5
	Coloured	28	9.3
	Indian	24	7.9
	Prefer not to say	4	1.3
	Total	302	100
Household Monthly Income	R0-R10000	33	10.9
	R11000-R20000	53	17.5
	R21000-R30000	55	18.2
	R40000<	125	41.4
	Prefer not to say.	36	11.9
	Total	302	100

Source: Statistical analysis results

4.2. The Outer Model Analysis: *Reliability and* Validity Testing

Following Sobaih and Elshaer's (2022) example, several statistics were employed to calculate the reliability and validity of the outer model. These statistics include composite reliability (CR); internal consistency reliability (Cronbach's alpha); convergent validity; and discriminant validity. First, according to Table 3, Cronbach's alpha (α) values ranged from 0.673 to 0.922 and composite reliability (CR) values ranged from 0.818 to 0.943, indicating that the scale has acceptable internal reliability (Hoffman et al., 2022).

4.3. Convergent Validity

Convergence validity was verified by evaluating whether or not AVE values were higher than 0.5, the minimum level of acceptability (Sobaih and Elshaer, 2022). The "average variance extracted" (AVE) scores of all the study factors (CM, ISC, PC, DC, DPC, CXEJ, and CL) were 0.63, 0.624, 0.602, 0.686, 0.847, 0.764, and 0,801 correspondingly. All these values outstripped 0.50, showing according to Kline (2015) an appropriate convergent validity.

4.4. Discriminant Validity

For the evaluation of discriminant validity, Heterotrait-Monotrait Ratio (HTMT) was utilized (Hair et al., 2014). Heterotrait-Monotrait Ratio (HTMT) is defined as the average correlation of the indicators across distinct constructs and their associated constructs (Ab Hamid et al., 2017). Following the suggestion of Rasoolimanesh (2022), the cut-off for HTMT should be <1. However, inference statistics as suggested by only an HTMT value of 1 should lead to a rejection level. Presented in Table 4 are the results of HTMT showing values less than 1 which signify that the constructs are acceptable. As a result, the discriminant validity of the test was proven (Haider et al., 2022).

Table 3: Reliability and convergent validity results

Constructs	Chronbach alpha	Composite reliability	Average value extracted
CM	0.851	0.894	0.63
ISC	0.795	0.868	0.624
PC	0.673	0.818	0.602
DC	0.885	0.916	0.686
DPC	0.909	0.943	0.847
CXEJ	0.922	0.942	0.764
CL	0.918	0,941	0.801

Source: From data analysis

After checking for the reliability and validity of the measurement model, the researchers had to verify the solidity of both the measurement and structural models (Mgiba and Chiliya, 2020). Garnier-Villarreal and Jorgensen (2020) state that the structural model analysis should be preceded by the confirmation of model fitness by checking the analysis results against fit indices threshold values. Two indices were used to confirm whether the collected data fitted the model, following academic good practice (Mukucha and Jaravaza, 2021; Van Laar and Braeken, 2022), and they are standard root-mean-square residual (SRMR) and normed fit index (NFI). The SRMR should be lower than 0.08 and NFI greater than 0.8 (Lestari et al., 2019). For analysis results, see Table 5.

After checking for model fitness, the researchers first verified the model integrity of the model, which was accomplished by verifying, the coefficient of determination (R^2), and the effect size and (F^2) (Hair et al., 2020; Jannah et al., 2020; Pramudito et al., 2023). The coefficient of determination (R^2) evaluates the explanatory power of the model. All R^2 values are shown in Table 6.

F^2 verifies the practical and theoretical importance of the effect and the power of the analysis (Fritz et al., 2012). The analysis results for the present study are displayed in Table 7. To evaluate the predictive capability and relevance of the conceptual model, we used Stone–Geisser's Q^2 (Geisser, 1974; Stone, 1974).

Calculating the $Q^2=1-(1-R_1^2)(1-R_2^2)(1-R_3^2)(1-R_4^2)(1-R_5^2)(1-R_6^2)=1-(1-0.371)\ (1-0.307)\ (1-0.147)\ (1-0.131)\ (1-471)\ (1-221)$

$Q^2=1-0.252=0.745$. Therefore, the Q^2 of this research model was $0.745 > 0$, indicating that the observed values have been reconstructed properly so that the model has predictive relevance (Henseler et al., 2016; Kiiru et al., 2022; Guo and Hou, 2022). The solid measurement and structural properties enhanced the confidence in testing the hypothesised relationships. The hypothesized analysis results are displayed in Table 8.

Table 4: Discriminant validity test results

Construct	CM	ISC	PC	DC	DPC	CXEJ
CM						
ISC	0.732					
PC	0.722	0.856				
DC	0.44	0.531	0.502			
DPC	0.409	0.531	0.488	0.91		
CXEJ	0.691	0.742	0.696	0.511	0.476	
CL	0.541	0.522	0.443	0.553	0.522	0.494

Source: Analysis results

Table 5: Fit indices

Index	Cut-off value	Analysis value	Remarks
NFI	0.9	0.813	Good fit
SRMR	0.08	0.06	Good fit

Source: Analysis results

Table 6: Coefficient determination results

Variable	Symbol	R-square values
ISC	R_1^2	0.371
PC	R_2^2	0.307
DC	R_3^2	0.147
DPC	R_4^2	0.131
CXEJ	R_5^2	0.471
CL	R_6^2	0.221

Source: Analysis results

5. DISCUSSION, ACADEMIC AND MANAGEMENT IMPLICATIONS, AND CONCLUDING REMARKS

Replicating and extending earlier research by Mgiba (2020), this study empirically tested respondents' perceptions of the ethical risks inherent when engaging in digital banking transactions, rated their experience (their satisfaction/dissatisfaction), and their loyalty intentions. The results confirm the propositions (extracted from Mgiba (2020), for the effect of management communication on all the ethical concerns of security, diversity, discrimination, privacy, and discrimination. Based on this analysis outcomes it can be safely stated that whatever safety precautions and customer protective measures managers communicate in banking services that employ AI technology do bring about all the concerns mentioned in that earlier study. Regarding the impact of these ethical concerns on participants' experience, the study can only confirm a direct positive association between security and privacy with satisfaction/dissatisfaction based on the data collected. Diversity and discrimination concerns did not influence whether participants were satisfied or not. If any, their effects could be considered minimal. However, the impact of satisfaction/dissatisfaction on customers' continued usage intentions of electronic-based banking services was confirmed. Their experience affects their loyalty intentions to the service.

The confirmation of the relationships between management communication and ethical concerns overlaps with many other previous studies. For instance, Janakiraman (2023) showed a positive relationship between electronic banking companies' management communication of online technology safeguards and

Table 7: Effect sizes (F^2) results

Construct	CM	ISC	PC	DC	DPC	CXEJ	CL
CM		0.59	0.443	0.172	0.15		
ISC						0.149	
PC						0.068	
DC						0.008	
DPC						0.004	
CXEJ							0.284

Source: Analysis results

Table 8: Hypotheses testing results

Hypothesis	Effect	Coefficient	P-value	Remarks
H1	CM----ISC	0.609	0.000	Significant
H2	CM----PC	0.554	0.00	Significant
H3	CM----DC	0.383	0.00	Significant
H4	CM----DPC	0.362	0.00	Significant
H5	ISC----CEJ	0.388	0.00	Significant
H6	PC-----CEJ	0.249	0.00	Significant
H7	DC-----CEJ	0.114	0.093	Not significant
H8	DPC---CEJ	0.076	0.211	Not significant
H9	CXJ----CL	0.47	0.00	Significant

*Level of significance: $P<0.05$.

responsiveness upon unforeseen breaches and clients' concerns about security and privacy. In other recent studies, customers showed appreciation of organisations improving their electronic technology safety features (Gui et al., 2023; Strauß, 2023), and communicating them to customers increases their perceived security (Almaiah et al., 2022) and boosts their confidence on the system (Alshurideh, 2022). Also, Papadopoulos and Cleveland (2023) confirmed a positive response to organisations that possess security regulatory systems and digital ethics. To further strengthen customer positive perception, the technology should also embrace the idea of catering to the diversity of its client base (Ahmad and Rahim, 2023). The effects of ethical business practice on customer satisfaction are a confirmation of an array of studies. For example, Gautam and Sah, 2023) confirmed the positive relationship between security, privacy, and customer satisfaction.

On the relationship between diversity, discrimination, and customer satisfaction, this study's findings contradict other recent findings.

For example, Tyagi et al., 2023) found a positive relationship between ethical banking services and customer acceptance of services. Also Malit et al., 2023) concluded the same for a Kenyan situation.

Lastly, the impact of Customer satisfaction on loyalty has been confirmed in many other studies. Examples are Amiri Aghdaie et al. (2022), Manyanga et al. (2022), and Alzaydi (2023). The findings from the present study imply that the general framework proposed by Mgiba (2020) can apply to the banking sector in a developing economy context when managers communicate their online banking services' safety features and response protocols in case of breaches. It has to be emphasized, however, that the impact of the issues related to ethical concerns do not necessarily positively impact customer satisfaction. Some of those earlier identified concerns do impact customers' value perception and customer satisfaction.

This study contributes to the existing body of services marketing literature by isolating specific management practices that give rise to customer ethical concerns. It also provides a missing link between Mgiba's (2020) proposed model by including customer satisfaction before loyalty intentions. The study, therefore, opens up avenues for further testing of the model on different economies and industry contexts. Different contexts would shed light in the understanding of the reasons behind the different outcomes between this study and other earlier findings. It is expected to generate further academic interest in pursuing comparative studies between developed and developing economies.

For managers, the growth of the theft of banking information has become one of the most common types of criminal activity on the Internet (Uyyala, 2023). On the practical implication of this research, online banking services providers should promote the adoption of internet-based banking services by emphasizing attention on communicating how their technology protects clients' sensitive information (Surwanti et al., 2023). Therefore, banking companies using AI-based technology should focus on easing digital security, privacy, diversity, and discrimination concerns to improve their business performance and lower customer concerns. A major step towards this goal would be increasing customer trust by communicating with customers and potential customers on their online safeguards, protocols, safety features, and how their information is protected by the banking organization (Lepperman et al., 2023).

5.1. Limitations and Possible Areas for Future Research

This study was conducted among online banking customers, which provides limitations and avenues for future investigation. We only requested respondents for their perceptions when transacting online and did not examine their perceptions when transacting manually in a branch. The outcomes cannot, therefore, be inferred for the general banking population. For instance, there might be ethical concerns that come from the sharing of personal information with banking institutions in general. Future research should investigate whether the presence of these concerns also influences their offline concerns as suggested by this study outcome. Further, the use of the three theories might be limiting the number of items in the questionnaires used, thus rendering biased responses. It is therefore suggested that future investigations use other known technology acceptance theories to obtain a balanced view.

Internet banking continues to present challenges to financial security and personal privacy. What organisations do to allay those challenges is crucial. This is even more important in today's increasingly competitive banking landscape.

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