

Banking Information Technology and Employee Job Satisfaction in Pakistan: A Cross-Sectional Survey

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ABSTRACT

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Article History:

Submitted: Jan 14, 2026
Revised: Feb 27, 2026
Accepted: Mar 27, 2026
Published online: Mar 30,
2026

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Objective: This study examines how digital banking technologies, including automated teller machines (ATMs), mobile banking, online banking, and electronic funds transfer (EFT), impact workers' job satisfaction in Pakistan's banking sector.

Design/methodology/approach: A quantitative, cross-sectional study design employed convenience sampling to collect survey data from 256 bank employees. The information was gathered using a standardized questionnaire with thirty items rated on a five-point Likert scale. The relationships between employees' perceptions of digital banking apps and job satisfaction were examined using statistical analysis.

Findings: The test's results demonstrate a strong correlation between positive perceptions of ATMs, mobile banking, internet banking, and EFT and higher levels of employee job satisfaction. When employees believed that digital banking technology was useful and efficient, they reported feeling more satisfied with their jobs. However, the cross-sectional methodology, convenience sampling, and reliance on self-reported data limit the results' generalizability and causal interpretation.

Practical implications: Banking organizations can enhance digital transformation initiatives with employee-focused strategies like digital skills training, user-friendly platforms, task management, and effective technical support to boost employee satisfaction and encourage successful technology adoption.

Originality/value: This study contributes to the limited empirical data about the relationship between the use of digital banking and the job satisfaction of Pakistani employees. By examining how employees perceive different digital banking technologies, it expands our understanding of the implications of digital transformation for human resources in the banking sector in emerging nations.

Keywords: bank employees; information technology applications; job satisfaction; digital banking; electronic banking; Pakistan

1| INTRODUCTION

1.1 Banking Digitalization and Employee Work

Digital banking is typically judged on transaction volume growth, customer adoption, service availability, and service efficiency. Those indicators are relevant, but they only show half of the organizational transformations. Electronic transactions, such as automated teller machines (ATMs), mobile-banking platforms, Internet-banking systems and electronic funds transfer (EFT) applications, also shift work within banks. Business activities traditionally handled by tellers can shift to self-service, and staff are expected to take on new duties in exception handling, customer service, systems support, compliance and cross-channel coordination. Information technology transforms the place and nature of banking services, then, in turn. Studies of technology and work design also indicate that digital systems can be used to change the nature of tasks, the skill sets needed to perform them, the information available to the user, and the level of interdependence between workers, technologies, and organizational processes (Bresnahan et al., 2002; Parker & Grote, 2022). This employee point of view is particularly important in Pakistan, where the regulatory and payments landscape has remained in a state of flux, with a push towards digital delivery. The State Bank of Pakistan's digital-bank framework and payments-system reporting document show that mobile, internet, ATM, and electronic-payment infrastructures are growing increasingly integral to banking activity (State Bank of Pakistan, 2022, 2025, 2026). These official records are not an employee-satisfaction outcome, but rather the sector context. Their relevance lies in the size or scope of the operational transition; when a customer goes through multiple connected channels, employees need to perform within the processes, controls and support systems that enable these channels. Previous studies on bankers' attitude towards electronic banking in Pakistan also suggest that the employees of the banks are not passive bystanders of customer-side innovation but rather have long been actively involved in this shift (Kaleem & Ahmad, 2008). Technology can be used to deliver a resource. The response time to retrieve information may facilitate the branch to answer customers' requests, standardized processing may minimize repetitive manual tasks, and the availability of a self-service system may alleviate the burden on the branches. Digital systems can also help to provide feedback on tasks and allow workers to focus on tasks that need judgment instead of routine processing. Research conducted on the workplace digitalization and its relationship to productivity, interesting work and other factors that could contribute to satisfaction have shown evidence of the relationship (Bolli & Pusterla, 2022). The positive association seems plausible as well in other work contexts where the study of information-

technology adoption and employee attitudes are conducted, as the industries and measures used in these studies cannot be directly transferred to Pakistani banking (Attar & Sweis, 2010; Pandita & Dominic, 2018). The same systems can generate requirements. They might be subjected to software changes that happen quickly, to perform the same service over multiple channels, to be monitored more closely electronically, to deal with greater customer-support workload, and to worry about automation's impact on their jobs. Techno-stress studies separate the technology demands from organizational factors that assist employees in coping with technology demands. Techno-stress makers are linked to less favourable workplace attitudes, and support, participation, and inhibitors can moderate the impact of digital demands (Ragu-Nathan et al., 2008). In the context of contemporary banking, the existing literature includes banking-specific issues like digital overload, surveillance, adaptation, and process alignment (Jain et al., 2025; Khalequzzaman et al., 2025; Kim et al., 2024). Digital banking shouldn't therefore be taken for granted as a tool to enhance employee experience. The satisfaction with which it is linked is partly dependent on the integration of the technology in work.

1.2 Problem and Research Gap

In a lot of electronic-banking research, ATM, mobile, Internet and transfer are all considered customer channels. That work describes the concepts of adoption, perceived usefulness, service quality, trust, security, and transaction behavior. It cannot, on its own, determine what the experience of the employees is regarding the same applications. A convenient channel can decrease the amount of branch traffic, but it can also increase the number of complex inquiries and failed transactions that must be referred to by staff. Similarly, a system that reduces transaction costs for an organization can force staff to become more familiar with a new process, track more lines, or deal with more exceptions within a short time frame. Customer and organizational benefits are therefore pertinent background, but employee job satisfaction has a different outcome requiring employee-level evidence.

The less voluminous literature geared to employees indicates that the separation is significant. Electronic or digital banking has been related to various constructs of banking studies and in various countries, namely employee attitudes, satisfaction, commitment, productivity or performance (Chhabria & Yadav, 2023; Gupta & Yadav, 2017; Kumar et al., 2024). The studies conducted in Pakistan have explored technology and bank employee performance and have reported descriptions of banker's attitudes towards electronic banking but have not currently tested the four application categories and job satisfaction for the dataset used in this present thesis in Pakistan (Abbas et al.,

2014; Kaleem & Ahmad, 2008). Other studies on banking in Pakistan and the region reveal that the satisfaction of employees is also influenced by their basic working environment (supervision, pay, working atmosphere, and promotion opportunities). These factors help in eradicating possible over technological explanation of job attitudes (Humayun et al., 2014; Hossain, 2014).

The evidence gap is therefore more limited than a claim that there has been no study of employee digital banking. The search done for this manuscript revealed the following direct and adjacent studies: Electronic banking, Employee satisfaction, Techno-stress, and Digital work. It does not present much peer-reviewed evidence to place the employees' perception of ATM, mobile-banking, internet-banking and EFT applications in one model of job satisfaction in Pakistan. The most similar studies look at other employee outcome (Chhabria & Yadav, 2023) or other country (Mutuku & Nyaribo, 2015). The present study is an attempt to fill that limited gap, making a report from the existing thesis survey which compares four applications. It does not take precedence over any other published or unpublished research or research that has not been indexed. This focus is helpful for interpretation and practicum. Information technology is not a homogeneous term and differences exist among applications. Cash and self-service transactions are closely related to ATM. Mobile, and internet banking extends the ability to access accounts remotely but might create other kinds of support and security needs. EFT applications simplify applications without losing compliance and exception management requirements. Comparisons across these categories can provide information on whether positive appraisals of each category are correlated with satisfaction in the presence of the other categories reported. However, the comparison should be limited due to possible high overlap in the measures applied and lack of documentation of the original questionnaire.

1.3 Purpose, Research Question, and Hypotheses

This study aims to estimate the relationship between the reported perception of four banking information-technology applications and job satisfaction of bank employees in cross sectional sample of bank employees in Pakistan. The four types of applications are ATM, mobile banking, internet banking and EFT. What is the relationship of four banking information-technology applications with job satisfaction among the bank staff working in the banks of Punjab in Pakistan? This study has four directionally hypothesized results based on a common work design assumption. Favourable experienced applications can facilitate access to information, minimize routine processing and help tasks to be completed. Every application can also convey studying, reliability, monitoring, or

exception-handling needs. The hypotheses are not about a causal impact of the installation of the technologies, but about the net association reported by respondents:

H1: There is a relationship between the use of ATM applications and employee job satisfaction.

H2: Employee job satisfaction is positively related to Mobile-banking application

H3: Employee job satisfaction will be positively related to internet-banking applications.

H4: There is a positive relationship between electronic funds-transfer application and employee job satisfaction.

1.4 Contribution and Scope

The paper contributes an empirical one in the context, as it recovers a focused article from a wider thesis. It reports on one model, which compares four application categories for a sample of 256 bank employees. All four relationships mentioned above could be explored simultaneously and employee attitude would be included in the conversation on the development of digital banking in Pakistan. The contribution is a comparative, not causal, one. The study did not include an experimental design with manipulation of technology, follow employees over time, or include a national sampling frame. It makes estimates about covariance within the sample available. In addition, the paper offers a staff perspective on digital implementation. Skills, readiness, employee barriers, and matching between technology and organizational processes are key aspects of banking transformation research, as highlighted in the works of Mayer and Strich (Mayer & Strich, 2023; Porfirio et al., 2024). This model does not measure the direct effect of training, techno-stress, empowerment, workload or job redesign. These concepts are thus included as literature-based explanations and boundary conditions, rather than tested mediators. This distinction allows for practical interpretation, while avoiding the imputation of unmeasured mechanisms to the respondents. There are several restrictions embedded in the research question. Although the source thesis mentions the random sampling method, the detailed method is deemed authoritative. No documentation of the banks, city, survey period, sampling frame or response rate or SPSS version. No full questionnaire or questionnaire sources were provided, and the raw data and original statistical output is not available. These exclusions limit the ability to replicate, evaluate construct validity, and to diagnose regression assumptions. They do not obliterate the reported results, but they establish the level of caution that must be taken in reporting the results. The rest of the paper expands the resources and demands argument for each hypothesis, outlines the documented survey method, report's reliability, correlation and regression results, and interprets the results based on the methodology in which they were created.

Employee experience is kept separate from customer adoption and the discussion finishes with what implications there are for implementation in the context of employee experience and for better designing the future research for employee experience.

2 | Literature Review

2.1 Job Satisfaction in Technology-Enabled Banking Work

Job satisfaction is a worker's opinion of their job and working experience. In view of the foundational treatments it is considered as an attitude that is influenced by the relationship between the things one gets from work and what one values and expects from work (Locke, 1976; Vroom, 1964). Satisfaction can be related to the various aspects of the job but cannot be limited to performance, motivation, compensation or fleeting positive mood. Additionally, models of effort–performance–satisfaction relationship warn that satisfaction and effort are not the same and have unique consequences and antecedents (Christen et al., 2006). In the banking sector, technology is a component of this assessment, along with supervision, work conditions, recognition, workload and employment security.

The job demand-resources perspective has a restricted view of technology-enabled work. Job resources are job characteristics that facilitate workers' performance, acquisition of competence or coping with demands. Job demands are ongoing efforts that can lead to strain if they are too demanding or too strong for the person's capacity or support (Bakker & Demerouti, 2017). Digital tools can fall into either of the two sections. A well-integrated and timely information system can be a resource, but a poorly integrated system which creates interruptions and conflicting procedures, can be a demand. The same technology can be used in different ways in different roles, too. A self-service channel could potentially mean fewer repetitive interactions with the teller, but more complicated interactions with the teller that are left behind. This dual nature is further enhanced in work-design research. Digital technologies can impact autonomy, feedback, task diversity, information processing, social interaction, and workload. The outcome is dependent on design decisions and the organizational context of use (Parker & Grote, 2022). Empirical studies on digitalization and job satisfaction also come up with positive pathways, such as productivity and interesting work, as well as negative pathways, such as time pressure and work-life interference (Bolli & Pusterla, 2022). A positive survey coefficient thus does not necessarily indicate that all employees have benefited, but rather that they have benefitted overall.

Techno-stress offers an alternative description of the demand pathway. Job attitudes can be undermined by technology overload and complexity and uncertainty, and by organizational support

that can enhance employees' coping capacity (Ragu-Nathan et al., 2008). A systematic review of techno-stress research also shows that techno-stress effects are not solely based on technology, but on the person, task, technology, and organizational response (Pothuganti Sanjeeva Kumar, 2024). Banking evidence on overload and surveillance further supports the importance of taking these conditions into account when interpreting positive application ratings (Khalequzzaman et al., 2025). In the current study, the constructs of JD and techno-stress dimensions were not measured directly. The framework is therefore not a proven model of theory. It supports some understanding of how positive attitudes towards applications might correlate with satisfaction and how implementation might have different results for different employees or organizations. It does not allow for a claim that the reported relationships were mediated by resources or demands. This is not an excessive dependence on theory either, or may help to ensure that the hypotheses are consistent with measures available. The two hypotheses are about application perception and job satisfaction, and the resource and demand constructs are used to explain the average positive relationship between them that can be hypothesized. The difference minimizes the danger of imputing to respondents motives or experiences that were not captured in the questionnaire.

2.2 Banking Information Technology and Employee Outcomes

Information technology has greatest impact on organizational performance when it is accompanied by skills and work reorganization. Recent firm-level evidence suggests that technology investment, decentralized organization and skilled labor can be interdependent rather than independent factors (Bresnahan et al., 2002). This complementarity is relevant in banking as digital channels are not used independently. They link customer-facing systems with authentication, account systems, risk management, services, and employee decision making. The experiences for employees will therefore mirror both the application and the system that was set up around it. Direct employee studies provide more specific support. Gupta and Yadav (2017) examined electronic banking in relation to bank employees, and Chhabria and Yadav (2023) linked electronic banking with job satisfaction and organizational commitment among bank employees. Kumar et al. (2024) also explored job-related factors and satisfaction of the employees of the banks regarding digital banking systems in Bangladesh. These studies provide a strong foundation that electronic-banking systems are believable employee-level antecedents or correlates. They are different in measures and settings; hence it is not their size that should impact the direction and relevance of the inquiry, but rather that of any coefficient in Pakistan.

More recent research goes beyond the general use of a system. The study on financial technology correlated digital-finance integration with satisfaction by means of psychological empowerment and digital mindset in a three-wave study (Liu & Soomro, 2025). Employee skills, readiness and the experience of stakeholders have also been emphasized in banking-transformation research (Porfirio et al., 2024). The research results of enterprise systems reveal that customers' satisfaction with a system is related to job stress, job involvement, and job satisfaction, indicating that customers' evaluation of a system may be part of their general evaluation of their job (Dong et al., 2023). The results confirm a model of an employee-driven one, although none captures the specific four-use format of the current survey. The competencies that employees contribute through also changes with banking transformation. Digital maturity is not just about the introduction of a platform. Staff will need to become familiar with new procedures, collaborate with technology and compliance experts, and understand how to leverage system functionality to better serve customers. These studies attribute employee perceptions, skills and adaptations as material outcomes to implementation outcomes in the study of financial technology and banking transformation. The results provide understanding for the possible relationship between application perceptions and job attitudes in situations where the systems are advertised publicly as customer channels (Basdekis et al., 2022; Kargas et al., 2025; Porfirio et al., 2024). These findings help explain why application perceptions may be related to job attitudes even where the systems are presented publicly as customer channels.

The satisfaction of employees isn't just a function of technology. In the past few years, there has been a surge in banking research linking work environment, compensation, remote working arrangements, job attitudes, job performance, or other employment factors with employee attitudes or performance (Gupta et al., 2024; Ruzele et al., 2024). These factors are not included in the current regression. Although this is a high fit, its application coefficients should not be interpreted as a complete model of job satisfaction. This problem without the context underscores the importance of considering the four measures as a focused technology model rather than a comprehensive report of employee satisfaction. So is the negative pathway. Bank employees will have to learn new interfaces, increase expectations for services, new controls, and increased scrutiny. Bank settings offer evidence that techno-stress is related to lower engagement or innovative behaviour, and that process alignment and organizational support are significant factors to the outcomes of employees (Jain et al., 2025; Khalequzzaman et al., 2025; Kim et al., 2024). This balance makes it impossible for the hypotheses to be construed as statements that greater technology leads to greater satisfaction. They forecast positive associations for good application perceptions in the measurement model of the study.

2.3 ATM Applications and Job Satisfaction

ATMs move routine cash withdrawal, balance check and associated transactions away from the counter and into a self-service terminal. For employees, it can improve queues to process transactions and decrease the number of simple, repetitive requests. It could enable branch staff to concentrate more on the issues with the accounts, customer advice and tasks that require judgment. Most research that views IT as a complement to work organization reinforces the main argument that automation can free up rather than replace tasks (Bresnahan et al., 2002; Parker & Grote, 2022). The central bank has documented ATM as one part of the payment system in Pakistan. (State Bank of Pakistan, 2026).

Other requirements may also be introduced to the work by using ATM. Employees can process card captures, unsuccessful withdrawals, customer disputes, consumer fraud issues, cash replenishment coordination, and assist customers with using a terminal. Some of the customer contact may be eliminated, and more difficult exceptions may be focused on in the branch, due to the automation. Close conceptual comparison is possible with a study conducted on Atlantic Mobile, ATM, Internet and EFT banking category in Kenya, but the result of the studies is peculiar and can only be used with caution as a confirmation (Mutuku & Nyaribo, 2015). The relationship that is expected, then, is one of positive perception of ATM applications by employees and not on the number of ATMs installed or used by customers. EMB's perception of ATM applications as dependable tools that minimize unnecessary "friction" during tasks and enhance productivity could potentially correspond with increased satisfaction scores. If, however, the operations of the ATM result in unhandled exceptions or insecurity, the association may become weak. The hypothesis of the present is capturing the expected net direction:

H1: ATM application is positively associated with employee job satisfaction.

2.4 Mobile Banking and Job Satisfaction

Mobile banking opens access to and use of accounts and transactions beyond the branch and fixed computers. Self-service for employees might also help to limit routine visits and provide staff with more flexibility when handling common requests. There is a possibility of positive correlation between electronic banking and employee outcomes, as suggested by the direct study conducted on electronic banking and employee outcomes (Chhabria & Yadav, 2023; Kumar et al., 2024). For Pakistan, the reporting of payments systems also puts mobile payments in the context of the current payments sector (State Bank of Pakistan, 2025, 2026).

Mobile banking can also lead to increased workload. Having a channel continuously available may set expectations for speedy help even if a branch is closed. Staff might be required to assist customers during registration/ authentication, changes of device, failed transfers, security issues and more. Updates can occur regularly, resulting in the need for repetition of learning, and digital incidents can lead to unforeseen support loads. All these conditions are like those of techno-stress demands, when employees are not trained, do not have control, or do not have reliable support (Ragu-Nathan et al., 2008). Thus, the quality of the application and the processes around it impact on the employee experience. Positive attitudes towards mobile-banking applications may be an indicator of the employees' perception of the mobile channel as having utility, control, and service-supporting qualities. These appraisals are supposed to be in line with a more favorable appraisal of the work, though cross-sectional design does not provide any direction for cause and effect:

H2: Mobile-banking application is positively associated with employee job satisfaction.

2.5 Internet Banking and Job Satisfaction

Internet banking is the type of banking that enables customers to get information and carry out transactions via web-based interfaces. In the banking sector, online access can enhance information interchange speeds between employees and customers and can help to minimize the manual handling of routine enquiries. Previous studies on the professional use of the Internet indicate that digital access can affect the relationship between work characteristics and job satisfaction both directly and indirectly via information and communication and task-efficiency pathways (Castellacci & Vinas-Bardolet, 2019). The study done on electronic banking from employee perspective further supports the idea of considering internet-banking applications as a part of work environment (Gupta & Yadav, 2017).

The demand side encompasses cyber-security protocols, password and access problems, transaction errors, integration with channels and attempts to communicate with the customer about online processes. There is also the possibility of frustration on the part of employees when there is a lack of consistency in information presented on front-end functions and internal systems. Enterprise-system evidence links system experience to stress, engagement and satisfaction, making system reliability and integration relevant to the relationship to be expected (Dong et al., 2023). The source questionnaire does not contain direct measurements of security burden or quality of integration, leaving these mechanisms to be interpreted. If internet-banking applications are rated positively by employees, they

will also be more satisfied with the application because of its ability to provide information and allow tasks to be completed. The hypothesis is expressed at the associative level:

H3: Internet-banking applications are positively associated with employee job satisfaction.

2.6 Electronic Funds Transfer and Job Satisfaction

EFT applications streamline the electronic transfer of funds (EFT) and may help minimize reliance on paper-based and manually coordinated transfer processes. Improved processing times, transparent transaction logs, and standardized workflows can ease the burden on staff and enable quicker resolution of customer inquiries related to transfers. Electronic transfers are seen as an integral element in the digital banking evolution of Pakistan (State Bank of Pakistan, 2022, 2026). However, evidence of the link between electronic banking and productivity, job security and other employee or organization outcomes also warrant focus on transfer systems, even if it does not necessarily establish satisfaction (Opoko Apendi et al., 2025). Transfer systems can generate challenging tasks related to compliance, authorizations, aborted transactions, reconciliation, fraud prevention and exception resolution. Standardization can make normal cases easier but also draw more abnormal cases to the attention of employees. The work-design approach suggests that the level of demands' evaluations will be influenced by the availability of resources like clear procedures, feedback, and support (Parker & Grote, 2022). EFT perceptions are thus to be understood as an evaluation of an application in a workflow and not merely as an evaluation of the speed of transactions. Where the application allows for accurate and controllable processing, positive EFT perceptions should be associated with increased satisfaction with the job. This assumption leads to the following hypothesis:

H4: Electronic-funds-transfer application is positively associated with employee job satisfaction.

2.7 Conceptual Model and Synthesis

The conceptual model shows these four ATM, mobile-banking, internet-banking and EFT application perceptions as four parallel predictors for job satisfaction. Each of the paths is a suggested positive association. The model does not include the constructs mediation (via resources, demands, empowerment, techno-stress, work redesign) as measured constructs because they were not documented. They give information about interpretation.

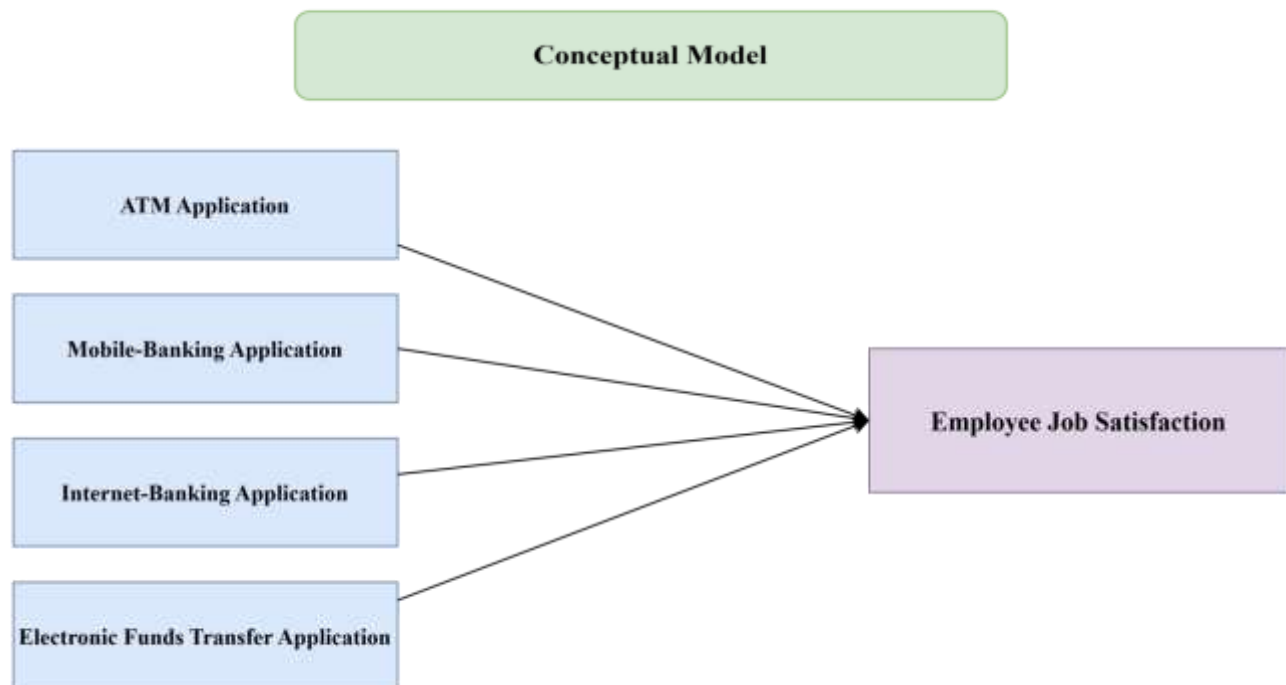


Figure-1 *Conceptual Model of Banking Information-Technology Applications and Job Satisfaction*

A parallel structure allows the reported regression to estimate the coefficient of a particular application while the other three are fixed. Such statistical interpretation is problematic when the predictors are highly intercorrelated. However, the source thesis does not provide any variance inflation factors, tolerance statistics, confidence interval or condition diagnostics (with the highest correlation between the predictors being .851). Multicollinearity is not a fatal error for a model and fixed numerical threshold should not be used without context (O'Brien, 2007). However, it does reduce confidence in the ability to adequately rank the 4 coefficients. The literature indeed confirms the balanced expectation. Positive attitudes towards digital applications can turn them into a resource for the job, supporting employees in information processing, transactions. They can also set demands via complexity, monitoring, learning, support work and uncertainty. If there is a sample available, there are positive net associations predicted by the hypotheses. The following section explains how those associations were quantified and examined, such as the limits contained in the documents that were inherited from the thesis.

3 | Research Methodology Research Design and Sample

3.1 Research Design and Setting

The study was of a cross-sectional survey descriptive type and quantitative approach. The data was gathered by paper based self-administered structured questionnaire, distributed to the bank staff of Pakistan. The design was appropriate for estimating the associations between the employees' reported

perceptions of the banking applications and their reported job satisfaction existing at the time of the study. It cannot make inferences about temporal order, or reverse or reciprocal relationships. With that in mind, it is throughout referred to associational analysis. The source thesis does not name any of the banks, cities, provinces, type of bank, organizational access, or data collection. There were no numerical tables or literature cited that could be used to reconstruct these fields. Hence, employment in banks is reported for Pakistan only. This exclusion reduces the generalizability and meaning of the study as organizational characteristics such as ownership, location, job role and digital implementation stage may have an impact on the experience of the applications by the employees.

3.2 Participants and Sampling

A final analytic sample of 256 bank employees was found. The detailed methodology provides that the respondents were chosen using a convenience sampling method because the number of respondents in the population was very hard to determine. This account was retained instead of the thesis abstract's inconsistent reference to random sampling. No sampling frame, randomization procedure, no selection probability was documented. The sample was therefore considered as a nonprobability sample of the accessible bank employees and should not be treated as a representative sample of the entire bank community. No information is provided on the eligibility criteria for employees, recruitment methods, number of questionnaires sent, number received, exclusions, incomplete responses or the response rate. It also fails to specify the population sample from which the sample was drawn, other than the bank employees in Pakistan. Nonresponse and coverage bias cannot be evaluated because of these gaps. Those limitations cannot be rectified by sample size and hence results are not reported as estimates of all bank employees in Pakistan. Gender, age and education were reported. Fifteen ninety men and ninety-seven women were listed on the source table. Ages were grouped into 20-30, 31-40, and 41-50 years. There were three reported categories of education, but the labels for the table were only partially consistent with the accompanying prose. The labels were marked for the author's verification and the counts and percentages were kept. There were no data to hand regarding job title, length of service, employment status, bank type, or previous digital-banking experience.

3.3 Instrument and Measures

There were 30 questions in the questionnaire, which included questions about the independent and dependent variables. Responses were scored on a 5-point scale, 1 = completely inconsistent with the actual situation, 2 = mostly inconsistent, 3 = basically consistent, 4 = mostly consistent, 5 = completely consistent, as described in the thesis. The following is like an agreement or a

correspondence scale, but the original questionnaire was not included. The items stemming, reverse coded items, scoring rules, language, translation process and administration instructions are not known. The reliability table shows five items for five constructs: ATM application, mobile-banking application, internet-banking application, EFT application, and job satisfaction. Of the 30 questions listed, 25 are covered by these five scales. The other five questions might have been demographic questions, but the thesis does not explicitly reconcile the count. The manuscript then outlines the assumed 5 scale composition and states that there is a need to confirm the full 30 question composition. History of the source or adaptation of the items in the material was not recorded for conversion. No copies were made of the example items, nor were there any indicators of expert review, translation equivalence, exploratory factor analysis, confirmatory factor analysis, convergent validity, or discriminant validity. The thesis argues that the revisions resulting from pilot feedback constitute content-validity support. It cannot be judged without the questionnaire, the records of the reviewers or a defined process for validation. The scales are therefore reported as internally consistent only and are not fully validated, as outlined in the present paper. The four application measures reflect workers' self-reported perceptions of the application categories being interpreted, not objective measures of availability of technology, volume of transactions, or quality of systems. Job satisfaction also is a self-report measure. The distinction is important because the associations found may be partially due to general evaluative attitude, response format, or survey context of the respondents. The construction of composite-scores is not explained in the thesis. The regression and correlation tables suggest that the items were added together for each construct, but it is unclear if sums, means, or another procedure were used. The direction of higher values seems more advantageous as all scale anchors are moving from inconsistent to consistent and the hypotheses are positive. This inference should be validated with the original questionnaire prior to submission.

3.4 Pilot Study and Internal Consistency

The interpretation of the findings of this pilot study and its internal consistency is presented. The thesis is based on a pilot study with 40 employees of various banks. According to the instrument, this was a preliminary investigation that led to a revised instrument. There was no documentation of the nature of the revisions, the criteria used to retain items or characteristics of the pilot participants. It remains to be seen whether the 40 pilot respondents were also included in the 256 respondents. Therefore, the pilot is reported as a step in the process of developing the questionnaire and is not considered as independent evidence of validation. Cronbach's alpha was calculated for each 5-item scale for internal consistency. Alpha measures the consistency of responses to the items based on

assumptions which cannot be completely tested from the values that are reported. Does not provide dimensionality, content adequacy or construct validity (Tavakol & Dennick, 2011). A judgement was made using the reported values regarding the consistency of the items within each scale for the thesis analyses, where no item level and factor level evidence was found, it was noted as a limitation. Students will learn how to collect data and develop an ethical approach for reporting it

3.5 Data Collection and Ethical Reporting

According to the thesis, questionnaires were delivered to the employees of the banks in the form of a paper copy and retrieved by the researchers. It does not account for the people who approached the participants, the presence of supervisors, the methods used for obtaining complete questionnaires, nor how privacy was ensured in the process of obtaining completed questionnaires. There was no information regarding incentives, data storage, anonymity, confidentiality, voluntary participation or withdrawal. Additionally, the source material does not contain the name of an ethics committee, an approval/wave number, or informed consent wording. These details cannot be deduced from the study design. The manuscript is not, therefore, an ethically approved manuscript and has not been documented to have received consent. The author is responsible for ensuring that the proper institutional review is completed prior to submission of the journal and providing a correct ethics and consent statement. Only in cases where there was no approval needed under the rules that may have been in effect at the time and place of data collection should potentially lack of approval be deemed from the relevant institution or policy, not claimed a posteriori.

3.6 Statistical Analysis

According to the thesis, analyses were conducted using SPSS; however, the version of SPSS is not mentioned. The frequencies and percentages of sample characteristics were reported, as were Cronbach's alpha values for internal consistency, Pearson correlations among the five constructs, and multiple linear regression analyses with job satisfaction as the dependent variable and the four application measures as the independent variables. The regression results presented a model summary, analysis of variance, unstandardized coefficients, standardized coefficients, standardized errors, test statistics and significance levels. Scale means and scale standard deviations were not included in the output, nor were there any tests of normality, linearity, or influential cases, nor any confidence intervals, variance inflation factors, tolerance, or homoscedasticity. No reconstruction of these quantities was made. There is a great deal of multicollinearity in the four predictor measures, in particular. While the variance inflation should be taken in context, there is a need for the diagnostics in the context of this for the unique coefficients to be ranked with confidence, O'Brien (2007)

cautions. Significance values are presented in APA style. Probabilities that are shown as .000 in the thesis are reported as $p < .001$ as a probability cannot be exactly zero. The positive coefficients in the reported model are statistical support for H1-H4. It does not imply a cause-and-effect relationship or confirm that all the regression conditions were met. Another potential source of common-method variance is the use of the same questionnaire and the same respondents for both predictors and outcome. Simply saying that associations are artefacts does not resolve the problem, nor does the use of simple post hoc thresholds (Fuller et al., 2016) (Podsakoff et al., 2003). No common method assessment was claimed as there were no item-level data or procedural details available.

4 |Results and Discussion

4.1 Sample Characteristics

Table 1 presents the reported sample composition. Men accounted for 159 respondents (62.1%) and women for 97 (37.9%). Most participants were 31-40 years old ($n = 161$, 62.9%). The other age groups were 20-30 years ($n = 57$, 22.3%) and 41-50 years ($n = 38$, 14.8%). The value of 62.9% was taken from the table because it is arithmetically consistent with 161 of 256; the thesis prose reports 62.1% for the same age group. The three education counts were 61 (23.8%), 121 (47.3%), and 74 (28.9%). The source extraction labels these categories as high school, university, and graduate students, while the prose describes them as intermediate, college, and master's degree. The numerical distributions are reproduced, but the labels remain provisional pending author verification. The table does not imply that these categories correspond to a standardized international classification.

Table 1. Reported Characteristics of the Survey Sample (N = 256)

Characteristic	Category	<i>n</i>	%
Gender	Men	159	62.1
	Women	97	37.9
Age (years)	20-30	57	22.3
	31-40	161	62.9
	41-50	38	14.8
	Category 1: high school/intermediate (label to verify)	61	23.8
Education	Category 2: university/college (label to verify)	121	47.3
	Category 3: graduate/master's (label to verify)	74	28.9

Note. Percentages are reproduced from the thesis table. Education labels differ between the table and accompanying prose and require confirmation before submission.

4.2 Internal Consistency

All five reported scales had Cronbach's alpha values above .70 (Table 2). The values ranged from .735 for mobile banking to .872 for job satisfaction. ATM application had an alpha of .745, internet-banking application .799, and EFT application .823. These values indicate adequate internal consistency for the reported items in this sample. They do not establish that each scale is unidimensional or distinct from the other application scales.

Table 2. Reported Internal Consistency of the Study Measures

Construct	Number of items	Cronbach's alpha
ATM application	5	0.745
Mobile-banking application	5	0.735
Internet-banking application	5	0.799
Electronic-funds-transfer application	5	0.823
Job satisfaction	5	0.872

Note. The original questionnaire and item-level data were unavailable. Alpha is reported as internal consistency, not construct-validity evidence.

4.3 Correlations and Predictor Overlap

Table 3 shows positive correlations between each application measure and job satisfaction. ATM application had the largest bivariate correlation with job satisfaction, $r = .786$, followed by mobile banking, $r = .777$, EFT, $r = .693$, and internet banking, $r = .635$. The thesis reports all four correlations as significant at the .01 level. These estimates support positive bivariate relationships but do not isolate the contribution of one application from the others.

The four application measures were also strongly inter-correlated. Their correlations ranged from .659 to .851. Mobile banking correlated .842 with ATM and .800 with internet banking. EFT correlated .843 with mobile banking and .851 with internet banking. These values indicate substantial overlap among the predictors. The pattern may reflect genuinely connected digital workflows, similarities in item wording or perceived application quality, a broader favourable-technology factor, or a combination of these explanations. The available output cannot distinguish among them.

Table 3. Reported Pearson Correlations Among Study Measures

Measure	1	2	3	4	5
1. ATM application	1				
2. Mobile-banking application	.842**	1			
3. Internet-banking application	.659**	.800**	1		
4. Electronic-funds-transfer application	.707**	.843**	.851**	1	
5. Job satisfaction	.786**	.777**	.635**	.693**	1

Note. * $p < .01$, two-tailed, as reported in the thesis. Exact p^* values and confidence intervals were unavailable.

4.4 Regression Model and Hypothesis Tests

The multiple regression model included ATM, mobile-banking, internet-banking, and EFT application scores as simultaneous predictors of job satisfaction. The reported multiple correlation was $R = .921$. The model accounted for 84.9% of the sample variance in job satisfaction, $R^2 = .849$, with adjusted $R^2 = .846$ and a standard error of the estimate of .20879. The overall regression was statistically significant, $F(4, 251) = 352.403$, $p < .001$. The reported sums of squares were 61.452 for regression, 10.942 for residuals, and 72.395 in total. Each application measure had a positive reported coefficient when the other three were included (Table 4). ATM application had $B = .370$, $SE = .040$, $\beta = .393$, $t = 9.174$, $p < .001$. Mobile-banking applications had $B = .179$, $SE = .043$, $\beta = .197$, $t = 4.169$, $p < .001$. Internet-banking applications had $B = .280$, $SE = .047$, $\beta = .307$, $t = 6.002$, $p < .001$. EFT application had $B = .104$, $SE = .034$, $\beta = .130$, $t = 3.111$, $p = .002$. The intercept was not statistically significant, $B = .139$, $SE = .089$, $t = 1.552$, $p = .122$.

Table 4. Reported Multiple Regression Predicting Job Satisfaction ($N = 256$)

Panel A. Model summary and analysis of variance

R	R^2	Adjusted R^2	Standard error	F	df	p
0.921	0.849	0.846	0.20879	352.403	4, 251	< .001

Panel B. Coefficients and hypothesis decisions

Predictor	B	SE	β	t	p	Decision
Constant	0.139	0.089	—	1.552	0.122	—
ATM application	0.37	0.04	0.393	9.174	< .001	H1 supported
Mobile-banking application	0.179	0.043	0.197	4.169	< .001	H2 supported
Internet-banking	0.28	0.047	0.307	6.002	< .001	H3 supported

application

Electronic-funds-transfer application	0.104	0.034	0.13	3.111	0.002	H4 supported
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Note. Dependent variable = job satisfaction. Variance inflation factors, tolerance, confidence intervals, and residual diagnostics were not available. Decisions refer to statistical support in the reported model and do not imply causality.

All the positive coefficients are consistent with H1-H4. ATM application had the highest standardized coefficient in the table reported, followed by internet banking, mobile banking and EFT. The order of this list is not meant to be a ranking of the importance of applications. Complications due to strong predictor correlations and lack of diagnostics for multicollinearity make comparisons difficult in terms of unique effects. The hypothesis decisions may also be made without making comparisons with magnitudes. For H1, the null test for a zero ATM coefficient was rejected in the reported model and the direction of the sign was the expected positive direction. This pattern was also observed for H2 (mobile banking) and H3 (internet banking), which resulted in both being reported at $p < .001$. The smallest test statistics of the four application coefficients was H4 for EFT but was still statistically significant at $p = .002$. As a result, there were no findings rejecting any of the four directional hypotheses. All parameters of the ANOVA are consistent except for rounding. The sum of squares of the regression and the sum of squares of the residuals is 72.394, whereas the total sum of square is reported as 72.395, with the difference being due to precision of the display. The $n = 251 - 4 - 1 = 256$ is the number of degrees of freedom in the residual. These checks are helpful in ensuring that the table is being faithfully transcribed but do not replace access to the output. Descriptive means, standard deviations, score ranges, confidence intervals and standardized residual summaries were not provided. For this reason, it is not possible to detect the general evaluation of all the applications in the Results section. Only reported relationships between construct scores are established. Similarly, the regression table enables statistical hypothesis testing but not an evaluation of practical difference in satisfaction for a well-defined change in one of the observed questionnaire scores due to the lack of documentation of both the wording of the items and the units of the composite scores.

4.5 Principal Findings

The study compared the relationship between four measures of information-technology applications at banks and job satisfaction in banking sector among 256 employees answered questionnaires in Pakistan. The four measures were all positively correlated with satisfaction at the bivariate level, and all had a positive coefficient in the reported simultaneous regression. The model

thus validated H1-H4 under the specification available. Those who were more positive about the ATM, mobile-banking, internet-banking and EFT applications were more likely to feel satisfied with their jobs.

The bivariate and multivariable results answer different questions. Each correlation coefficient represents the overall linear association between the score on the application and satisfaction, while ignoring the other application scores. The standardized regression coefficients are the reported association between one score given the other three scores. The largest bivariate correlation and standardized coefficient was found for ATM, but all of the predictors were very inter-correlated. In this context, a large coefficient can either mean that there is a clear association or that the allocation of shared variance is unstable. The paper would be unable to conclude that, in the mean, ATM is substantively more important than the other applications without introducing the elements of tolerance and confidence intervals. The reported R^2 of .849 is also very high for a model of employee attitudes using four self-report predictors. An interpretation is that the working lives of employees with respect to the use of digital applications are closely related to their overall assessment of their working situations in the sample of workplaces. There are other possible explanations. The relationships observed may have been enhanced by similar item wording, a general favorable-technology assessment, common response tendencies, or other common method factors. Design and measurement procedures are recommended for common-method research, not if a single diagnostic will show or disprove bias (Fuller et al., 2016) (Podsakoff et al., 2003). The large fit is thus not evidence that applications determine satisfaction but is rather reported as a sample statistic.

4.6 Interpretation in Relation to Prior Research

The general positive trend is in line with direct studies that view electronic/digital banking as an employee's working experience. Chhabria and Yadav (2023) associated Electronic Banking with job satisfaction and organizational commitment among the banking employees of India, while Gupta and Yadav (2017) studied e-banking relationship with banking employees. Kumar et al. (2024) conducted a comparative study at the regional level, which centered on the employment-related factors and satisfaction of digital-banking systems in Bangladesh. The present results further add this overall trend to the Pakistani sample and classify four types of application in one reported model. Comparisons by coefficient are not possible due to differences in instruments, samples and outcomes. The result of the ATM is consistent with a workflow that decreases repetitive branch transactions through self-service automation and provides employees with increased capacity for nonroutine work. It could also

indicate that it has been around longer with ATM integration and the processes are more familiar to users than newer digital channels. Prior Pak specific banker research indicates that employees' perceptions matter in the context of electronic-banking implementation (Kaleem & Ahmad, 2008), and general studies highlight the complementarities between information technology, skill and work organization (Bresnahan et al., 2002). These explanations are not measured in the present survey and, therefore, could not be proven to be pathways.

When adding the other applications, the coefficient for mobile banking was still positive. The remote self-service can decrease the demand for routine service in branches and enable employees to engage in more in-depth service needs. Concurrently, mobile channels might create queries for registration, authentication, security, and failed transactions, which need help from the employees. Techno-stress theory posits that the balance will be dependent on workload, uncertainty, user support and employee involvement (Ragu-Nathan et al., 2008). Despite the positive coefficient, this sample does not demonstrate that the expectations for continuous mobile services were not present. Internet banking had second largest bivariate correlation with satisfaction and second largest standardized coefficient in the regression. This change exemplifies bivariate ordering, and the conditional coefficients should not be mixed up. Internet banking can offer beneficial information access and processing, but security, integration and exception-handling requirements impact on employee experience. The task-efficiency and employee-well-being relationships can be supported by research on professional Internet use and satisfaction with the system used (Castellacci & Vinas-Bardolet, 2019) (Dong et al., 2023). There is, however, a high correlation between mobile banking and EFT, and so the coefficient reported may be scale specific.

EFT had the lowest standardized coefficient, but it was still a positive association with satisfaction. Standardization of transfer processes can help to enhance traceability and minimize manual handling, but there are still process compliance and exception handling aspects that need employee attention. Given the current research links e-banking to other employees and organizational outcomes like productivity, innovativeness, and job security, further examination of employee transfer systems could be considered under the employee work umbrella (Opoko Apendi et al., 2025). The current model incorporates satisfaction as the outcome, but it does not specify which EFT tasks respondents reported using when answering the scale. The four positive coefficients need to be interpreted in the context of evidence that digital work is not always positive. Bolli and Pusterla (2022) found positive and negative channels from digitalization to job satisfaction. Banking research has identified techno-stress,

digital overload, surveillance, job stress, and adaptation as relevant employee conditions (Jain et al., 2025) (Kargas et al., 2025) (Khalequzzaman et al., 2025). Some employees in the current sample might have felt strain, and some banks might have been less supportive in implementing the program and still have a positive average association. The outcome is not a universally positive outcome, but rather a covariance.

4.7 Theoretical Contribution

The study provides a modest contribution to digital work design reasoning in application specific perceptions in banking. It is suggested that the resource pathway is associated with more positive job attitudes, because it encompasses systems that facilitate access to information, transaction processing, task completion and service coordination. The demand pathway suggests that the relationship may be diminished by complexity, overload, monitoring, uncertainty, and burdens of support. The positive numbers of respondents' net appraisals of the applications are consistent with a positive net appraisal of the applications. It is not directly assessed whether there are disparities between resources and demand because neither pathway was assessed as a mediator. This separation allows for the difference between the use of theory to explain a pattern and theory confirmation. The job demands-resources framework suggests that the implementation conditions may influence employee outcomes (Bakker & Demerouti, 2017), and digital work design research identifies properties that workplace technology can afford to change the tasks and employee experience (Parker & Grote, 2022). The source questionnaire measures application and satisfaction scores, but NOT measures of autonomy, workload, feedback, empowerment, nor techno-stress. The study thus provides background evidence that is congruent with the framework. There is also a question of measurement when comparing the four applications. Several correlations between ATM, mobile-banking, internet-banking and EFT measures were .800 or greater. These uses will not be experienced by employees as stand-alone features. They could assess a system delivering connected digital services or the overall technology quality of a bank. Future measurement work should evaluate the separation of the four categories on the empirical level, whether they are nested within an overarching measurement construct, or whether they can be better measured as workflow bundles. Theoretically, the issue is important because employee experience can occur as a result of channel integration and not just a single application.

5 |CONCLUSION

The purpose of this study was to examine the relationship between four banking information-technology application measures and job satisfaction of 256 bank employees that were sampled in Pakistan. Each of the application perceptions (ATM, mobile-banking, internet-banking and EFT) had a positive correlation with satisfaction, and each had a positive coefficient in the reported simultaneous regression. All four directional hypotheses were supported by the results that were available within the given model. The results add employee experience to the list of customer and operational views of digital banking. Employees may be more likely to have positive attitudes towards the job when they find applications useful, manageable, and supportive of task completion. The action response is not only to increase technology. Banks need to check on how systems distribute work, train staff in transition from one type of work to another, ensure that they are supported, and handle exceptions across channels. The evidence is confined. Causal inference, solid predictor ranking and national generalization are not possible due to convenience sampling, unknown bank coverage, unknown location coverage, cross-sectional self-report measures, lack of documentation of the scale, and high correlations between predictors, and missing diagnostic output. Although this model explained a substantial amount of variance in the sample, this statistic needs to be recalculated with raw data, validated measures, and complete diagnostics. The meaning of the study is the question it poses for digital-banking managers. The implementation of technology should be evaluated at least in terms of how the new processes it creates can be used to carry out a worker's job. This judgment is based on the evidence related to task demands, learning, exceptions, support, and employee attitudes. It can't be obtained from transaction growth. Employee perception is a reasonable concern for management, because here it is associated with four positive perceptions, but because of the design of the study, a general claim that increasing one application will increase satisfaction is not warranted. The next step in research is to eliminate the “documentary uncertainty” and make the design clear. A replicable study would report on the banks that were participating, what roles they played, the questionnaire and the procedure it would follow in obtaining scores, ethics and recruitment, test of the measurement structure, and regression diagnostics with uncertainty intervals. The changes in application experience could then be assessed prior to the changes in job satisfaction through repeated measures. This evidence would help to identify if there are specific relationships between the four channels, or a general assessment of digital work. The immediate conclusion is also measured in the same manner as practice. Banks can use employee comments as an indicator of how to implement, investigate any repeated issues with workflow and see if support can keep up with digital expansion.

Such actions are considered sound management responses and not as actions that are demonstrated by this cross-sectional model. Greater research efforts should integrate documented multi-bank sampling and longitudinal measurement and objective work indicators. It should also examine the impact of digital applications on satisfaction with both the information available to the recipient and the feeling of empowerment, as well as the demands of digital applications, such as overload, monitoring, and support burden. In the meantime, the current results provide context evidence that employee perceptions should be formally included in the assessment of banking digitalization.

6 |IMPLICATIONS

6.1 Practical Implications

The main empirical take-home message is to pay attention to employee perceptions when assessing digital-channel implementation in banks. Adoption and transactional cannot detect if a system is reliable, easy to use, and facilitates staff working. Frequent, brief employee evaluations can detect similar issues in system usability, exception handling, information consistency, and support. These evaluations should be linked to real improvement processes and not be considered as independent satisfaction scores. Training should be linked to job and processes. Research on banking-transformation highlights the capability and readiness of the employees to face the digital transformation (Porfirio et al., 2024). Those who help customers go through the mobile registration process require a different type of support from those who process EFT exceptions and those who are working with ATM disputes. Training and practice opportunities, clear procedures and accessible technical assistance could improve the value of a resource application, while decreasing uncertainty. This is an implication based on the literature and not an effect that can be tested with the present questionnaire. Another issue banks should consider is workload redistribution. Work doesn't go away if transactions move to the digital channel. It can centralise complex cases, establish new digital queues and transfer responsibility between branches, operations, compliance and technology teams. Autonomy, feedback, staffing, coordination, system failures and recovery need to be considered in human-centered work design (Parker & Grote, 2022). Managers can compare performance measures across branches before and after significant channel changes, including branch traffic, support tickets, exception volumes, overtime, and employee feedback. This operational data would be used in conjunction with subjective satisfaction data. There should be effective mechanisms for escalation in the implementation support. Staff should be familiar with the corresponding owner of a failed transaction, security incident, customer complaint or data inconsistency and what information is needed to solve it. Organizational support can mitigate technology-related strain particularly when it

comes to overload or surveillance (Khalequzzaman et al., 2025). With clear ownership and feedback loops, you can also turn on an ongoing problem with employees into a system / process improvement. The results cannot be interpreted for unrelated prescriptions in the field of human resources. The thesis had recommendations related to the salary system, performance appraisal, employee-assistance plans, punishment, fairness and the restructuring of the organization which were not weighed by the reported model. Those claims were removed from this article. The more practically defensible message is more limited: Digital implementation should be assessed based on employee experience and supported by training, usable systems, workload monitoring, role clarity, and support.

6.1 Limitations

It is important to note that the first major limitation is the sampling design. Convenience sampling was used to select participants, and the thesis does not specify the banks, cities, provinces or branch types or the sampling frame. The distribution and return counts are not available, so no response rate can be computed. These omissions make coverage and nonresponse bias assessment impossible and preclude national generalization. The results apply to the sample surveyed. The cross-sectional self-report design has drawbacks in terms of temporal and causal inferences. Perceptions of the application and job satisfaction were assessed at the same time from the same sample. Applications that generally were satisfactory might have been reviewed in a more positive light by the employees, or satisfaction might be related to the other factors, which might also reflect another organizational condition. To understand the direction, you need to have either longitudinal or quasi-experimental evidence. Documentation of measurement is incomplete. There was no information available about the original questionnaire, item sources, adaptation process, example items, rules governing scoring, or information regarding translation. While acceptable alpha was found, internal consistency does not prove validity or distinguishability of the constructs (Tavakol & Dennick, 2011). The discrepancy between the total number of questions (30) and the number of scale items reported (25) is also not explained. The predictor correlations are problematic for the development of multicollinearity issues. Some of them were above .80, but the thesis provided no VIF, tolerance, confidence intervals, nor other diagnostic information. The model might provide a good estimate of the joint relation but provide a less stable estimate of individual coefficients. This should not, therefore, be taken to imply strict priority in the application. There was a lack of other analytical information. Raw data and SPSS output were not provided, and missing data could not be handled, composite-scores could not be constructed, the assumptions about residuals could not be reassessed, influential observations could not be determined, and common-method conditions could not be

addressed. The extremely high R^2 s make the checks more significant. Lastly, there was lack of ethics-approval, consent, confidentiality, and data-storage documentation in the source material. There must be a gap in reporting that is filled correctly prior to submitting.

6.2 Future Research

Future studies should include multi-bank sampling by region and bank type, providing a frame, eligibility criteria, distributions and response counts. Better external validity would be achieved with probability or carefully stratified sampling. Longitudinal designs could assess employee attitudes before and after a digitized implementation, and repeated observations could differentiate the short-term disruption from longer-term adaptation. Measurement work should report the full instrument and test on the factor structure of the four application scales. If the channel perceptions are highly correlated, a higher order digital-application construct may be a better fit. Possible mechanisms like techno-stress, digital competence, psychological empowerment, training quality, workload redistribution, role clarity and system usability should also be measured in the studies. There would be less reliance on a single questionnaire if the objective or independently sourced indicators are included, such as support tickets, transaction exceptions, workload, absenteeism, and service outcomes. Mixed-method designs may help to understand how the same application may be a resource for some employees and a demand for others. Interviews/focus groups should be recorded with documented recruitment and analysis protocols and should be tied to specific roles and workflows. This kind of research would be useful to take this association-based mapping to a more detailed description of employee-centered banking transition.

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