Using Mixed Method to Understand Customer Experience With Digital Banking Services: Comparisons Between South Korea and Philippines

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ABSTRACT

The purpose of this study is to employ a novel mixed method to better understand the differences in the customer service experience of the digital banking services in South Korea and the Philippines. Data mining techniques and customer journey mapping analysis were utilized to understand the proposed issues. The results indicate that there are four critical significant points of digital banking services between South Korea and the Philippines including the number of touchpoints, speed of results, registration requirements, and touchpoint deviations. Potential causes and implications are discussed in this article. The contribution of this study is using mixed approach to understand the issues which related to bank marketing in the digital era. Additionally, this study also enriches the investigations of customer service experience in banking across different countries. Overall, the findings of this study benefit the development of digital banking services, especially in the Asia Pacific countries.

KEYWORDS

Customer Journey Map, Data Mining, Digital Banking Service, Mixed Method, Text Mining

INTRODUCTION

Digital banking has gained significant popularity worldwide, offering innovative banking services that differ considerably from those of traditional banks, primarily due to the broader context of internet banking. The adoption of digital banking has accelerated during and after the ongoing COVID-19 pandemic. Prior research has highlighted the impact of national culture on banking services (Dash et al., 2009). In Asia, each country’s unique information infrastructure development has resulted...
in varying stages of digital banking advancement. For instance, in Taiwan, the government has been actively involved in the development of digital banking services since 2019, leading to the establishment of three digital banks. Given these circumstances, it has become crucial to compare digital banking services across different countries, in order to gain a comprehensive understanding of this novel online banking phenomenon.

This study focuses on South Korea and the Philippines, for three primary reasons. First, the Philippines aims to catch up with South Korea in terms of digital banking services. Second, this study seeks to explore the strengths and weaknesses of digital banking services in these two countries. Last, as we examine these issues, our research findings can serve as a valuable reference for the future development of digital banks in Taiwan.

As per statistical data, the number of digital banking users in South Korea has risen from approximately 104.73 million before the pandemic to 146 million currently (Yoon, 2022). South Korea has been at the forefront in using technological advancements as an effective strategy to address the increasing influence of neighboring nations. Presently, it is commonplace for Korean citizens to conduct their daily activities online, such as notifying a change of address or performing banking transactions. These developments can be attributed to the 1987 framework law on the promotion of computerization, which enhanced the quality of life of the population and contributed to national economic development. As a consequence of this law, the Korean government initiated the digitalization of crucial sectors, including resident registration, land registration, finance, and banking (Joung, 2020). The rapid evolution of IT and traditional mobile applications has played a pivotal role in the swift advancement of digital banking in South Korea (Shin et al., 2019).

In the Philippines, the geographical challenge posed by its more than 7,000 islands makes it difficult for traditional banks to provide comprehensive coverage, especially in remote areas. According to the 2019 Financial Inclusion Survey conducted by the Central Bank of the Philippines, only approximately 29% of Filipinos have a formal financial institution account. This leaves around 71% of the population, equivalent to 51.2 million people, still unbanked. The primary considerations for individuals in opening an account are typically the financial costs or benefits associated with it. Another significant finding from the survey is that more Filipinos own mobile phones than have financial institution accounts. Specifically, 69% of the population possesses a mobile phone, but only a small fraction use mobile phones or the internet for financial transactions. However, the COVID-19 pandemic has accelerated the adoption of digital banking in the Philippines. The governor of the Central Bank of the Philippines revealed that digital payments experienced remarkable growth during this period. Two electronic transfer service providers in the country recorded growth rates of 820% and 143%, respectively, between 2019 and 2020 (Diokno, 2020). The pandemic prompted a shift toward digital transactions, allowing people to conduct financial activities without visiting physical bank branches. Looking ahead, the governor aims to achieve a formal financial institution account penetration rate of 70% among the population by 2023, with 50% of payment transactions being conducted digitally (Diokno, 2020). The pandemic was as a catalyst for the country’s digital transformation, with over 10 million digital accounts being registered in 2020 alone (Diokno, 2020).

Digital banking differs from traditional banking by automating processes and providing services online. It leverages application programming interfaces to integrate services across different institutions and offers a wide range of banking products and transactions (Shin et al., 2019). Essentially, a digital bank should provide all the functional aspects of banking across different service delivery platforms. This includes features such as bank cards, online banking services, ATM services, and access to point-of-sale machines, similar to the functions available in a physical bank branch (Shin, 2021). Therefore, understanding the consumer’s experience within the context of an all-digital banking environment becomes even more critical compared to traditional banking services (Shahid et al., 2022).

In the big data era, combining various methods with big data analysis can provide a deeper understanding of the customer journey. One commonly used method in the field of service science is the customer journey map (CJM). The CJM relies on limited data to comprehend customers’
perceptions of the service experience. Integration of text mining methods with CJMs can enhance this understanding, in order to further improve the customer service experience. The specific objective of this study is to integrate the aforementioned methods and adopt a mixed-method approach to analyze the customer journey through digital banking.

The subsequent sections of this paper are structured as follows: First, the relevant literature is reviewed. We then outline the data collection process and research methods employed in this study, respectively. Next, the empirical findings and their implications are presented. Finally, the conclusions of the study are described, along with its limitations and potential directions for future research.

THEORETICAL BACKGROUND AND LITERATURE REVIEW

Customer Journey

In this study, the theoretical foundation lies in the concept of the customer journey. The analysis was conducted using CJMs and data mining techniques. The customer journey is crucial for understanding user experiences within numerous service contexts, and it varies across different national cultures (Canfield & Basso, 2017). Tueanrat et al. (2021) identified five key components within the customer journey: service satisfaction, failure and recovery, co-creation, customer response, and channel and technological disruption. Accordingly, the operational variables considered in this study encompass the number of touchpoints, speed of results, documentary requirements, touchpoint deviation, and the number of pain points.

The CJM method serves multiple purposes, including evaluating customer experiences, offering a strategic management tool for service innovation, and understanding customer perceptions and behaviors (Addis, 2016; Lemon & Verhoef, 2016; Micheaux & Bosio, 2019; Cui et al., 2022). It focuses on the different stages or touchpoints that customers go through before, during, and after using a service. These touchpoints are crucial components of CJMs as they determine customer perceptions (Cambra-Fierro et al., 2021). CJMs visually map the user journey, highlighting the various stages and steps required to fully experience a service (Marquez et al., 2015). Multiple methods can be employed to develop CJMs, including surveys or interviews, with the goal of connecting marketing channels and consumer experiences at each stage of the customer journey (Vollrath & Villegas, 2021). Touchpoints play a significant role in customer engagement, and controlling them can enhance an organization’s performance (Vakulenko et al., 2019). With the evolving nature of customer journeys across various touchpoints, channels, and platforms, businesses are increasingly focusing on delivering better customer experiences (Lemon & Verhoef, 2016). Consequently, many businesses use CJMs to identify problems, discover unsatisfied expectations, and find opportunities for service and operational improvements (Moon et al., 2016). From a business standpoint, a CJM is an efficient strategy for improving service, reducing costs, and minimizing turnover (Halvorsrud et al., 2016). Moreover, the CJM aligns with service design principles by organizing customer interactions from the first point of contact through a detailed outline of the service experience (Micheaux & Bosio, 2019). In terms of marketing and service science, customer satisfaction is the fundamental basis for understanding customer experience throughout the customer journey. Service failure and recovery are closely tied to problematic touchpoints or journey structures and involve mechanisms to mitigate negative consequences (Tueanrat et al., 2021).

In recent times, there has been growing interest among businesses in combining CJMs with data mining methods to gain valuable insights and to more efficiently identify pain points in customer experiences. For instance, Tupikovskaja-Omovie and Tyler (2021) compared digital customers’ shopping journeys to evaluate the accuracy and effectiveness of the Google Analytics database. Hollebeek et al. (2020) developed a CJM for virtual reality to enhance the user experience of VR journeys. Rudkowski et al. (2020) investigated the impact of touchpoints ownership and analyzed the marketplace-based pop-up customer journey. These studies demonstrate the potential of integrating big data and CJMs to gain a deeper understanding of the customer journey and experience, particularly
in its early stages. While the CJM has been applied in various fields, to the best of our knowledge, this study represents the first attempt to model the digital banking experience from the customer’s perspective using the CJM.

Digital Banking Services

Customer satisfaction is crucial in establishing credibility and fostering loyalty in the context of digital banking applications (Sampaio et al., 2017). User feedback, which reflects users’ satisfaction level with a given application, directly impacts their loyalty (Wang et al., 2018). As a result, businesses often seek customer scores and feedback after users download a mobile application, to gain insights into their experience. However, managing and processing a large volume of unstructured user evaluations can be challenging for businesses (Al-Hawari et al., 2020).

Mbama et al. (2018) proposed that brand trust, perceived usability, service quality, and employee-customer engagement are key factors influencing customer experience and loyalty. Customer satisfaction in the digital banking context is achieved when customer expectations are met, while failure to meet these expectations can lead to negative perceptions of the bank (Larsson & Viitaoja, 2017). Shin et al. (2019) conducted a comparison of customer experiences between digital and traditional bank users in South Korea. They found that users between the ages of 20 to 25 preferred digital banking, while those aged 46 to 50 preferred traditional banking. Digital banks offer advantages such as convenience, higher interest rates, lower transfer fees, faster service, and easier account opening. However, challenges related to employee-customer engagement and security were also identified. Furthermore, customers tend to use digital banks primarily for fund transfers rather than deposits and withdrawals. While numerous studies have focused on internet banking or mobile payments, there is a research gap regarding digital banking services, which this study aims to address.

Cross-Cultural Research in Digital Banking

Sampaio et al. (2017) conducted a study on the main drivers behind the adoption of mobile banking applications in three countries: Brazil, India, and the United States. Their research highlighted the influence of cultural orientation on customer awareness in the global context. Similarly, Merhi et al. (2019) examined the perspectives of banking application users in two distinct cultural environments: the United Kingdom and Lebanon. These cross-cultural studies provide valuable insights for policymakers and mobile banking institutions regarding the development of targeted strategies for implementing mobile banking in various countries and cultural settings. Indeed, cross-cultural research plays a significant role in understanding customers’ behaviors and preferences in a global business context, as it reveals the influence of cultural differences and similarities. While previous studies have explored the impact of culture on customer behaviors, there is a research gap in comparing a developed Asian country such as South Korea with a developing Asian country such as the Philippines. This study aims to address this gap and shed light on how cultural orientation and values influence user participation and, consequently, revenue generation.

User-Generated Content and Text Mining

Efforts have been dedicated to leveraging user-generated content (UGC), which refers to voluntarily provided feedback uploaded to various media channels. Reviews, being an expression of customers’ unbiased experiences, play a crucial role in aiding consumer decision-making and subsequently influencing sales and pricing (Duan et al., 2022). Consumers generally place more trust in feedback from average citizens as it reflects their authentic product experiences (Bahng & Lee, 2020). Guerreiro and Rita (2020) emphasized the significance of consumer attitudes toward products, services, or experiences as indicators of customer satisfaction. Prior research has underscored the value of comprehending these reviews for businesses seeking to enhance their products to align with customer expectations. Additionally, these reviews can facilitate improved marketing promotions, advertising, and post-sales support (Bahng & Lee, 2020). The availability of UGC has empowered businesses to
develop novel marketing techniques to maintain competitiveness. Hence, it is increasingly imperative for businesses to use UGC to gain a comprehensive understanding of their customers.

Online reviews are the most prevalent form of UGC and serve as the primary data source for this study. Previous research predominantly relied on survey data, with limited exploration of online reviews as a reference. Furthermore, in the global context, it is recognized that cultural orientation influences customer awareness of online banking services (Merhi et al., 2019; Sampaio et al., 2017).

Given the abundant availability of online review data, data mining approaches have been employed to extract valuable information and identify patterns (Tao et al., 2020). Text mining is a commonly used data mining technique for analyzing and examining online reviews (Kim & Chung, 2019). It involves extracting insightful information from unstructured text. Mining UGC has emerged as an efficient means of understanding customer satisfaction, with the advantage of quicker data collection compared to surveys (Kim & Chun, 2019). Topic modeling, including techniques such as Latent Dirichlet Allocation (LDA), is widely used to analyze the elements that drive customer satisfaction and gain deeper consumer insights (Kiatkawsin et al., 2020). LDA organizes each text corpus into topics, represented by a set of words associated with certain probabilities (Guzman & Maalej, 2014). Customers tend to write about memorable encounters, leading them to neglect irrelevant topics in their reviews (Kiatkawsin et al., 2020). Previous studies have applied LDA in various industries, including tourism, health and safety, and the sharing economy, but there is a lack of topic-modeling techniques specifically conducted for digital banking.

**RESEARCH METHODS**

This study proposes a mixed-method approach used to comprehensively explore the customer experience of digital banking users. By using a CJM, a detailed understanding of users’ thoughts, emotions, and actions at each stage of their customer journey can be obtained. Traditionally, the development of CJMs has relied on costly and time-consuming in-depth interviews with designers, a qualitative research methodology. To address these limitations, customer reviews have emerged as a valuable source of information for capturing users’ emotional responses. This study aims to integrate these two approaches, presenting a novel approach to improve customer service in the digital banking sector. The proposed framework, as depicted in Figure 1, consists of three modules: text mining, CJM establishment, and CJM analysis. This integrated approach enables the analysis of digital banking CJMs for selected cases in the two chosen countries.

This study employed two primary data mining techniques—text mining and topic modeling—to analyze and extract valuable insights from the collected data. The overall process is illustrated in Figure 2.

**Text Mining**

For data preprocessing of the reviews from Philippine digital banks, the following steps were performed. Since most of the reviews were in English, the natural language toolkit (NLTK) in Python

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**Figure 1. Research framework**

![Research framework diagram](image1.png)
was used for analysis. To ensure consistency, the reviews were converted to lowercase. Unnecessary punctuation marks were removed from the text. Stopwords, which are commonly used but add little meaning to the analysis, were eliminated using the NLTK’s English stopwords corpus along with a customized list of stopwords. Lastly, word lemmatization was applied using TextBlob to transform words into their root form, facilitating further analysis.

For the Korean digital banking reviews, Korean natural language processing in Python (KoNLPy) was employed. This process leverages the existing morphemes used in South Korea to analyze the reviews. Part of speech (POS) tagging was applied to mark up the morphemes in a phrase based on their meaning and context. Unlike English, Korean exhibits significant changes in form. Therefore, the analysis focused on the smallest semantic unit, the morpheme. In Korean text analysis, stop words, such as conjunctions and prepositions, which frequently recur but lack meaningful significance, were eliminated. Common words such as “-나, 은, 는, 이, 가.” were examples of such stop words. Only nouns were extracted in this approach to ensure more accurate results, given that Korean verbs are complex and possess various grammatical forms.

Topic Modeling

LDA is a probabilistic topic-modeling technique that identifies the topics in each document and captures word exchangeability, which is a crucial aspect of LDA analysis. LDA assumes that topics are generated through a random process based on the probability distribution of words associated with each topic. Through the topic-specific keyword derivation process in LDA analysis, the determinants of service quality can be inferred. The analytical results present the keywords within the topic in a specific order, with keywords that are more likely to occur in that topic being displayed prominently.

CJM Establishment

The CJM establishment in this study follows a five-phase process, divided into three main stages: data collection, customer sampling and recruitment, and customer journey analysis and interpretation. This process is illustrated in Figure 3 (Halvorsrud et al., 2016).

The process for constructing the CJM in this study involves five phases: data collection, customer sampling and recruitment, case summaries, planned and actual journey mapping, and customer journey analysis and interpretation. These phases enable a comprehensive understanding and interpretation of the service experience. Key elements such as service failures, customer responses to these failures, and service recovery attempts by the service provider are closely examined. The planned journey is represented by interconnected touchpoints labeled as T1, T2, T3, and so on, while any deviations from the planned journey are indicated by labels D1, D2, and so forth. These phases form the framework for constructing the CJM, as depicted in Figure 3 (Halvorsrud et al., 2016).
Phase 1 – Overview & Scope: The primary objective of the first phase is to select the digital banking service that will be the focus of the study. During this phase, the analysis scope will be determined by identifying the specific customer group segment and other relevant individual characteristics. This step is crucial in defining the target audience and ensuring that the study is conducted with a clear focus on the chosen digital banking service.

Phase 2 – Planned Journey: In the second phase, the planned journey from the perspective of the bank is determined. This involves creating a structured diagram that outlines the step-by-step process as disclosed by the bank. To ensure accuracy, the planned journey will be verified through user testing, which involves personal experiences of individuals using the digital banking service. The purpose of this verification is to ensure that the planned journey accurately reflects the user’s experience. By comparing the planned journey with the actual journeys mapped in Phase 5, any deviations or differences can be identified and analyzed.

Phase 3 – Sampling: All participants in the study will be adult citizens who currently reside in the country and have been using the digital banking application for more than one month. The study will not impose any restrictions based on age, gender, education level, or household income. The goal is to include a diverse range of participants to gather comprehensive insights into the customer experience of digital banking across different demographic backgrounds.

Phase 4 – Interviews: The fourth phase of the study will involve conducting interviews with participants. This step is crucial because it allows us to model and map out the various touchpoints that each customer encounters throughout their digital banking service experience. The information collected during these interviews will serve as the foundation for mapping the actual journeys in Phase 5. By gaining insights directly from the customers, we aim to capture their firsthand experiences and perspectives, enabling us to create an accurate representation of their digital banking journeys.

Phase 5 – Actual Journey and Case Summaries: Phase 5 of the study focuses on mapping out each customer’s journey using the information obtained from the user interviews conducted in Phase 4. In this phase, detailed summaries of each customer experience, including the various touchpoints encountered, will be visualized. The purpose is to provide a comprehensive and visual representation of the customer journey within the digital banking service. Additionally, the actual journey mapped in Phase 5 will be compared to the planned journey developed in Phase 2. This comparison allows for the identification of any variations or discrepancies between the intended customer journey and the actual experiences reported by the customers. By conducting this comparison, valuable insights can be gained regarding the alignment between the planned and actual journeys, highlighting areas where improvements may be necessary to enhance the overall customer experience in digital banking.
RESULTS

Based on the above research design, the results are discussed in the following sub-sections.

Planned CJM

For the CJM analyses in this study, we focused on the loan feature of digital banking applications in both South Korea and the Philippines. The analysis was designed to be entirely digital, with all touchpoints occurring within the mobile application. We included various users, both those who had a successful loan experience and those who encountered difficulties. There were no restrictions on whether the customers were first-time applicants or repeat applicants. The goal was to capture a comprehensive view of the customer journey for different types of users in order to gain insights into the loan application process and identify areas for improvement. In the following sections, we will discuss the planned CJMs for both South Korea and the Philippines, outlining the various touchpoints and stages that users are expected to encounter throughout their loan application journey within the digital banking applications of each country.

For the digital banking analysis in South Korea, we selected Kakaobank as the reference digital bank. Kakaobank, established in 2016, is a prominent digital bank in South Korea, jointly owned by Korea Investment Holdings and Kakao Corporation, an internet platform company. It boasts a substantial user base, with around 11 million active users per month, a majority of whom are under the age of 50. Kakaobank offers a unique loan system with five types of loan products. The first type is the “비상금대출” (emergency loan), which is easily accessible through an ATM—and customers also receive a debit card after obtaining this loan. The second type is the “마이너스통장대출” (overdraft loan), which allows customers to use funds as needed, with interest only being accrued on the amount spent each day. In other words, customers can borrow only the necessary amount and reduce interest expenses by using the loan whenever convenient. The third loan product is the “신용대출” (credit loan) for customers who have been employed for more than three months. The fourth loan product, “개인사업자 대출” (personal business loan), caters to customers interested in starting their own businesses. The fifth loan product is the “전월세보증금 대출” (Jeonse, monthly rental house loan), which allows young people aged 19 to 34 to apply for a loan when renting a house or Jeonse in the Korean real estate market. The planned CJM for Kakaobank’s loan service in South Korea is depicted in Figure 4. It includes a total of seven touchpoints that each user goes through during the loan application process. These touchpoints represent the key stages and interactions involved in availing the loan service.

In the case of the Philippines, we focused on CIMB PH as the digital banking application for analysis. CIMB PH was selected because it was the first digital bank in the Philippines to offer a loan service. Additionally, the loan feature of CIMB PH received negative feedback in online reviews, making it an interesting case to study. CIMB PH offers two main loan products: personal and fixed-term loans. These loan products are relatively simple compared to the offerings of other digital banks.

Figure 4. The planned customer journey for the Korea case
A personal loan is a flexible loan option that caters to the financial needs of individuals. On the other hand, the fixed-term loan provides customers with a specific loan amount and term for repayment. During the loan application process in CIMB PH, there are 13 disclosed touchpoints that each customer must go through. These touchpoints represent the various stages and interactions involved in applying for a loan through the CIMB PH digital banking application. The planned CJM for the loan application process in CIMB PH is depicted in Figure 5. It provides a visual representation of the customer’s journey and the touchpoints they encounter during the loan application process.

**CJM Analysis Through Interviews**

In Kakaobank’s case, after the user agrees to the specified terms and conditions in T2 of the planned CJM, there are two stages of verification that users need to go through. The first stage is self-identification, where the user must enter their Korean National Identification Number. This step does not involve uploading a picture of their ID card (T3). The second stage is mobile phone verification (T4), where users must undergo authentication using their cell phone. Lastly, at the final touchpoints of the planned CJM, users are prompted to enter their email address and provide their bank account details to obtain the result of their loan application.

Based on our interviews with the users, the most common negative experiences they have encountered are the following:

1. Unable to authenticate phone numbers when living abroad and using a different phone number.
2. Long waiting time for results.
3. No email or text message notice of results.

Figure 6 illustrates the actual loan journey of a Kakaobank user. Interviewee 1 experienced certain deviations from the planned journey. First, there was a prolonged waiting period for the loan application results, which differed from the expected timeline (D1). Furthermore, when Interviewee 1 failed to obtain the loan (D2), no notification or message was received. Instead, the failure to secure the loan was indicated only on the application page (D3).

In the case of the Philippines’ CIMB PH, the loan journey is divided into three phases: Pre-Application, During Application, and Post-Application, as depicted in Figure 5. During the Pre-
Application phase, the user logs in to the CIMB PH mobile app, selects the desired loan product (personal loan or fixed-term loan), and provides preliminary details such as date of birth, employment type, tax identification number, gross monthly income, and purpose of the loan. In the During Application phase, the user proceeds to select the desired loan amount and tenure, accepts the terms and conditions, and provides more personal details, including employment information and emergency contact. The user is also required to digitally sign the application and select the preferred disbursement method. Additionally, the user must upload income documents, such as a one-month pay slip, certificate of employment, or income tax forms, to support their loan application. Finally, in the Post-Application phase, the user awaits the final approval of the loan and is notified of the outcome through the mobile app, text message, or email.

Based on user interviews, the most common negative experiences users encountered are:

1. Long waiting time for results.
2. Technical errors in the virtual verification stage.
3. Technical errors in the application.
4. Approval of reduced loan amount from originally applied-for amount.
5. Double confirmation of income details.
6. Requirement of undergoing an additional step on final approval (e.g., downloading another application for additional verification).

Figure 7 shows a successful example of an actual journey, and Figure 8 shows an unsuccessful example.

For Philippines Interviewee 1’s CIMB PH loan journey, the touchpoints from T0 to T11 proceeded smoothly. However, during the waiting period for final approval, the user receives a text message from the bank instructing them to download another application called “CIMB Bank Digital - GetVerified” within three days. The text message included a unique code and application number. “CIMB Bank Digital - GetVerified” is a credit scoring application provided by CIMB PH’s partner, Credolab. Credolab is a fintech solution provider based in Singapore that uses mobile and web behavior data to generate an alternative credit score. This application is currently available only for Android devices. The user proceeds to download the “CIMB Bank Digital - GetVerified” application from the Google Play Store and enters the unique code and application number provided. The user grants the permissions requested within the app and waits again for the final approval. After a 24-hour waiting period, the user receives a notice of approval, indicating that their loan application has been successfully approved.

For Philippines Interviewee 2’s CIMB PH loan journey, the user successfully completed touchpoints T0 to T9, including uploading the required income documents. However, after three
weeks of waiting, the user realized there had been no update on their application. Upon checking their application status, the user discovered they had not completed the virtual verification process and initial loan approval, which is represented by touchpoint T10 in the CJM. The user proceeded to complete this step. After reaching touchpoint T11, which is the final approval stage, the user experienced another waiting period of 48 hours. However, they did not receive any feedback or notification during this time. Concerned about the delay, the user decided to contact customer support to follow up on their application. During the conversation with customer support, the user was informed that there were incorrect or incomplete items filled out in their application. The support representative assured the user they would fix the issue and email them once they could proceed with the application again. The user patiently waited for 24 hours but did not receive an email as promised. Instead, they received a notification stating that their application was unsuccessful and the loan was not approved.

Interview results reveal notable disparities in the IT infrastructure of the two countries, which significantly impact the overall customer experience. Specifically, in South Korea, the banking system is capable of swiftly confirming a customer’s identity and assessing their financial capacity through the utilization of their citizens’ identification number. This efficient process expedites the loan approval procedure. Conversely, in the Philippines, the inadequate state of national infrastructure forces many banks to rely on customers to furnish tangible documentary evidence for identity verification and other fundamental procedures. Consequently, even in the realm of online banking, customers are obliged to upload pertinent documents, and ensuring the accuracy of the provided information often
necessitates several days of manual verification. These factors collectively contribute to protracted loan approval processes, consuming multiple working days. There is a clear difference between the number of touchpoints that a customer has to go through in both countries. Kakaobank users go through no more than seven touchpoints while users of CIMB PH go through a total of 13 touchpoints. Based on the above analysis, the differences between the customer journeys of users in South Korea and the Philippines are highlighted below, including:

1. **Speed of loan approval result:** In South Korea, the loan approval process is generally swift due to the efficient confirmation of customer identity and financial capacity through the use of the citizens’ identification number. However, there is a shortcoming in terms of notifying users of their application results, which can lead to uncertainty for applicants.

   In the Philippines, the loan approval process is more time-consuming due to the reliance on customers to provide documentary evidence for identity verification. Users experience a waiting period, as well as additional steps such as downloading another application, and may need to seek assistance from customer service. Human intervention is still required in this process.

2. **Documentary requirements:** In the Philippines (CIMB PH), users must upload income documents and provide various personal details before reaching the initial approval stage. This step is not in the customer journeys of South Korean applicants, where the focus is on inputting the ID number and mobile authentication.

3. **Touchpoint deviations:** In South Korea, deviations in the customer journey primarily relate to loan rejection, with limited technical errors reported. In the Philippines, deviations in the customer journey are more commonly associated with application errors, in addition to loan rejection.

These differences highlight the varying experiences and challenges faced by digital banking users in South Korea and the Philippines, particularly in terms of the speed of loan approval, documentary requirements, and touchpoint deviations. These findings underscore the impact of IT infrastructure, procedural variations, and customer support on the overall customer experience in the digital banking loan application process.

**CJM Analysis Through Text Mining**

Gathering customer opinions through interviews presents inherent challenges, limiting the ability to collect a substantial volume of authentic viewpoints. However, customers of CIMB PH and Kakaobank often express their experiences and opinions on the Google Play Store platform, providing a valuable source of data for analysis. By leveraging text mining techniques, we can systematically analyze and extract insights from the wealth of customer reviews. This approach allows us to access a broader spectrum of customer thoughts and opinions, complementing the constraints of interview-based investigations with a limited number of participants.

For text mining purposes, we checked application reviews from the Google Play Store for CIMB PH and Kakaobank over a period of two years. The breakdown of the reviews is presented in Table 1 and Figure 9. While the current application review score ratings distribution may suggest a

<table>
<thead>
<tr>
<th>Table 1. Dataset information</th>
<th>Philippines: CIMB PH</th>
<th>South Korea: Kakaobank</th>
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<td>Number of Reviews</td>
<td>10,582</td>
<td>13,825</td>
</tr>
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satisfactory user experience for CIMB PH and Kakaobank, the real concerns of the users cannot be fully visualized by solely examining the app scores.

The topic-modeling technique was applied to extract loan application topics from the reviews in South Korea. The results are summarized in Table 2, which presents the review contents associated with each keyword.

In the Philippines, CIMB PH stands out among other digital banks as the only option offering a loan application feature. While users express their interest in this feature, there is also feedback indicating a lengthy application process. This feedback suggests the need for the bank to review and improve its current processes to enhance customer satisfaction (Table 3).

Table 2. Kakaobank topic modeling

<table>
<thead>
<tr>
<th>Transfer, deposit</th>
<th>Account</th>
<th>Commission</th>
<th>General Kakaobank usage</th>
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<tr>
<td>이체 (transfer)</td>
<td>계좌 (account)</td>
<td>기업 (financial)</td>
<td>은행 (bank)</td>
</tr>
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<td>수수료 (commission)</td>
<td>통장 (bankbook)</td>
<td>기능 (function)</td>
<td>사용 (use)</td>
</tr>
<tr>
<td>입금 (deposit)</td>
<td>금융 (financial)</td>
<td>최고 (Niceness)</td>
<td>카뱅 (kakao)</td>
</tr>
<tr>
<td>송금 (remittance)</td>
<td>앱업 (installation)</td>
<td>혜택 (benefit)</td>
<td>방 (app)</td>
</tr>
</tbody>
</table>

Table 2. Kakaobank topic modeling

<table>
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<tr>
<th>Loan</th>
<th>Verification</th>
<th>Install application</th>
</tr>
</thead>
<tbody>
<tr>
<td>transfer</td>
<td>update</td>
<td>사용 (use)</td>
</tr>
<tr>
<td>deposit</td>
<td>number</td>
<td>카카오 (kakao)</td>
</tr>
<tr>
<td>loan</td>
<td>authentication</td>
<td>범죄 (bank)</td>
</tr>
<tr>
<td>account</td>
<td>installation</td>
<td>어플 (application)</td>
</tr>
<tr>
<td>commission</td>
<td>open</td>
<td>은행 (bank)</td>
</tr>
<tr>
<td>interest</td>
<td>error</td>
<td>사용 (use)</td>
</tr>
<tr>
<td>process</td>
<td>account</td>
<td>카뱅 (kakao)</td>
</tr>
</tbody>
</table>
Integrated Analysis

The focus of this study is to combine the aforementioned methods to analyze the customer experience of digital banking in two countries. The results of the analysis for each case are presented below.

South Korean Case

The analysis of Kakaobank’s customer journey mapping and matching with reviews reveals there are relatively few deviations in the process. The focus of customer reviews is primarily on the outcome of the loan application rather than specific deviations encountered during the journey. Out of a total of 13,825 reviews collected from 2017 to 2020, there were 292 reviews specifically about loans. Among these, 117 reviews were positive, while 175 reviews were negative. Interestingly, most of negative reviews were concentrated in 2017, which coincides with the year of Kakaobank’s launch.

By analyzing the negative reviews and focusing on the pain points or recurring problems, several key issues related to the loan function were identified. These findings are summarized in Table 4. Despite these pain points, users still expressed praise for Kakaobank’s loan app due to the convenience and benefits of the loan service it provides.

Philippines Case

To provide a clear illustration of the shortcomings and advantages of the loan feature, Table 5 presents an overview of pain points categorized by the application stage and related to the loan feature, as determined using Method 1. The analysis is based on a total of 1,114 reviews, with 693 reviews specifically addressing negative experiences with the loan feature (Table 5). These findings serve to reinforce the insights gathered from the customer journey mapping process.

Based on the analysis of the sampled reviews, it is evident that negative experiences mainly occur during the loan application process, with the most prevalent issue being technical difficulties. On the other hand, users who reported positive experiences attributed them to the speedy turnaround of the loan application process. In the realm of digital banking applications, two crucial factors to consider...
Table 4. Number of pain points (Kakaobank)

<table>
<thead>
<tr>
<th>Stage/Touchpoint</th>
<th>Pain Points (Negative Reviews)</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-application</td>
<td>Check your personal loan limit</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Apply for the loan</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Waiting time</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Accessing the app</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Customer service center</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Complaints (interest rates, update app, etc.)</td>
<td>7</td>
</tr>
<tr>
<td>During application</td>
<td>Rejection of the loan</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Results of loan application</td>
<td>6</td>
</tr>
<tr>
<td>Post-application</td>
<td>Check card</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Account balance</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>175</td>
</tr>
</tbody>
</table>

Table 5. Number of pain points (Philippines case)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Pain Points (Negative Reviews)</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-application</td>
<td>Technical issues</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Missing information</td>
<td>2</td>
</tr>
<tr>
<td>During application</td>
<td>Technical issues</td>
<td>130</td>
</tr>
<tr>
<td></td>
<td>Identity verification</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Uploading of documents</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Missing information</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Complex process</td>
<td>22</td>
</tr>
<tr>
<td>Post application</td>
<td>Long waiting time</td>
<td>166</td>
</tr>
<tr>
<td></td>
<td>Application denied</td>
<td>166</td>
</tr>
<tr>
<td></td>
<td>Technical issues</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Additional requirement on final approval</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Reduced amount</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>693</td>
</tr>
</tbody>
</table>

are customer identity and credibility. In the case of Kakaobank and CIMB PH, verification emerged as a common topic in the reviews. However, the verification processes employed by these banks differ. Kakaobank utilizes the customers’ ID number and cell phone for verification, while CIMB PH incorporates a virtual check as well. Nevertheless, users of both banks encountered challenges with the verification process, despite the differing methods employed.

Another noteworthy observation is that both digital banks receive a higher number of negative reviews compared to positive reviews. Merely examining the overall app score of these banks might give the impression that the application is performing well, as there are a significant number of five-star reviews. However, when specifically considering loan reviews, it becomes evident that there are
underlying issues that both banks should address. These issues may not be readily apparent from a surface-level analysis and require a deeper examination to understand the challenges faced by users.

A comparison of the pain points reveals that KakaoBank primarily receives negative reviews due to rejected loan applications and long waiting times. This indicates that KakaoBank’s application process is generally smooth and efficient. Rejected applications are attributed to the customer’s credit score rather than any shortcomings of the bank itself. In contrast, CIMB PH in the Philippines receives a significant number of negative reviews related to technical issues occurring at various stages of the loan application process, including pre-application, during application, and post-application stages. These technical issues reflect poorly on the bank, as they are internal errors that the bank has more control over and should address to improve the customer experience.

CONCLUSION

Findings and Discussions
The primary objective of this study is to employ a novel mixed method to gain deeper insights into customer service experience with digital banking in two Asia-Pacific countries. The initial launch of KakaoBank in Korea in 2017 was accompanied by a higher number of negative reviews related to the loan function, as well as errors occurring during the loan balance-checking process.

In the case of the Philippines, this study revealed that all customers experienced one or more deviations from the intended customer journey, with an average of three touchpoint deviations per customer during the loan application process. The verification and final decision stage of the bank was found to be inconsistent. To enhance the loan application process and provide a more positive experience for customers, the following recommendations are suggested:

1. **Proper disclosure:** Ensuring the proper disclosure of information to customers is crucial. This includes providing clear and accurate details about the loan application process and timely notifications regarding the approval or disapproval of the application. Proper disclosure empowers customers to make informed decisions and better prepare for the application process.

2. **A more consistent and simpler loan application process:** South Korea’s KakaoBank serves as a good example, where a streamlined and straightforward application process is favored by users. Minimizing manual interventions and standardizing the process can help reduce the length of the application process and provide a more consistent experience for all users. Currently, the planned journey in the Philippines consists of 13 steps, which might be perceived as burdensome for some users. Simplifying the process can help maintain user interest.

3. **A trustworthy mobile application with better usability:** The study findings align with prior research, suggesting that brand trust and perceived usability significantly impact the customer experience. It is essential to establish trust through transparency and to enhance the usability of the mobile applications. The identified issues of lack of proper disclosure and inconsistencies in the application process reflect a low regard for transparency, which negatively affects the perceived usability of the loan feature for customers. By addressing these recommendations, digital banks can improve the loan application process, enhance transparency, and provide a more satisfactory customer experience.

Contributions and Implications
This study makes several contributions to the practical and managerial development of digital banking services. First, the cross-country comparisons provide valuable references for countries aiming to develop their own digital banking services. By describing and comparing two typical service patterns in South Korea and the Philippines, this study offers insights and lessons that can guide the development of digital banks in other countries.
Moreover, the findings of this study contribute to the improvement of the selected cases. By identifying pain points and areas of concern for customers, the study offers recommendations for banks to enhance their services and address customer needs more effectively.

The integration of different methods in this study, including text mining, machine learning, and customer journey mapping, provides a comprehensive view of the customer service experience in digital banking. This approach allows for a deeper understanding of customers’ overall journeys, their concerns, and their positive and negative perceptions of various features. It also offers insights into the broader field of customer experience and digital banking.

The inclusion of data from different countries with distinct features further broadens the implications of this study. The findings can inform the development of digital banking services, particularly in Asia, by considering diverse customer experiences and preferences across different markets.

One of the key takeaways from this study is the importance of listening to the customer’s voice and understanding their overall experience. Through text mining and machine learning techniques, the study extracts and analyzes the main topics and sentiments from customers’ reviews, providing valuable insights for banks. By identifying areas of criticism and areas of positive reception, the results serve as a guide for banks seeking to improve and develop their services.

Furthermore, the incorporation of customer journey mapping adds another layer of understanding to the customer experience. By examining the touchpoints and customer journeys, the study highlights service failures that may have otherwise been overlooked. Through addressing transparency and usability issues, banks can enhance the overall customer experience and improve customer satisfaction.

Limitations and Future Directions

This study has several limitations that should be acknowledged. First, the focus on two specific countries, South Korea and the Philippines, limits the generalizability of the findings. Variations in digital banking services may exist within each country, and other countries may have different patterns and challenges. Future research could explore the variations within a single country to gain a more comprehensive understanding. In terms of text mining, determining the appropriate length of character strings for analysis is challenging. Short strings may lack context, leading to lower accuracy in the analysis. Additionally, spelling errors, inconsistencies, and language variations can impact the accuracy of the analyses, even with advanced data mining tools. Future studies could explore sentiment analysis techniques to conduct more detailed analyses of all reviews. The use of emotional vocabulary dictionaries can determine the sentiment of the documents. Another limitation relates to the difficulty in conducting loan interviews and obtaining loan-related data. Due to privacy concerns, obtaining loan information is challenging, which restricts its availability for analysis. Future research could explore alternative methods of gathering loan-related data while ensuring privacy and confidentiality. Overall, these limitations highlight areas for further research and improvement in understanding customer service experiences in digital banking.
REFERENCES


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