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Providing a Data-Driven Model of E-Banking Customer Experience Using Knowledge of Digital Marketing

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ABSTRACT

This research presents a data-driven model of the customer experience in electronic banking, utilizing knowledge from digital marketing. The study is an applied-developmental research, and it involves a cross-sectional survey. A semi-structured interview and a Likert scale questionnaire were used to collect data. The statistical population in the qualitative section includes experts from the banking industry. Using a targeted method, 15 experts participated in this section. The statistical population consists of one million people, specifically active customers of electronic banking. The sample size was determined using the Cochran table, resulting in a sample of 384 people. To analyze, the grounded theory method was employed in MAXQDA. For the validation and presentation of the final model, the structural equation modeling method and SMARTPLS software were utilized. Accordingly, there are 6 categories for causal factors: proper decision-making, time management, digitalization effects, cost management, business trends, and relationship management. There are also 2 categories for background conditions: banking industry and digital economy. Additionally, there are 2 categories for intervening conditions: individual factors and environmental factors. Furthermore, there are 4 categories for strategy: digital tools, trust building and training, digital differentiation, and digital platform. Lastly, there are 3 categories for outcomes: prosperity of the banking industry, customer satisfaction, and economic productivity. Banks are an important pillar of the economy, and the strategies they adopt will have an impact on the post-pandemic economic recovery. Digitization is one of the important strategies for banks to offer the best and most reliable solutions to customers in their current banking operations. ©authors

1. Introduction

Customer knowledge management is a company's process for collecting, storing, evaluating, and analyzing customer data and insights (Pozharliev et al., 2022). This typically includes information such as purchase history, demographics, customer feedback, past customer service interactions, and more (Fan et al., 2023). Keeping existing customers and attracting new customers for any organization means increasing business, improving profitability, and ultimately enhancing banking productivity. One of the most effective methods for customer attraction and retention is managing customer experience data (A). Khter et al. (2022). Based on modern marketing theories, the management of customer experience through knowledge is an undeniable necessity (Malhotra et al., 2022). The managers of the organization must agree to relinquish a portion of their control over the value creation process and transfer it to their customers. This is done in order to establish a favorable brand image within the target community, which consists of the organization's customers (Hodgkinson and colleagues, 2022).

Therefore, it is more logical for the process of value co-creation to be carried out in collaboration with customers and through the analysis of organizational data. This ensures alignment between the organization's goals and customer expectations (Fischer & Maas, 2019). Customer Experience data can reshape capitalism and its relationship with society (Ibáñez-Sánchez et al., 2022). In various studies conducted in the last decade, the importance of managing customer experience data has been emphasized. Exploiting and analyzing customer experience data as a management strategy can help identify business opportunities within social problems. The knowledge of customer experience acts as a new tool in the field of competition, particularly in the emerging realm of experimental economy, for creating a competitive advantage (Hakimi et al., 2018).

The correct arrangement of the main structures of digital marketing in retaining,

developing, and strengthening customers has become one of the most important challenges in marketing due to its final effect on customer repurchasing (Elnahass et al., 2021). In this regard, many organizations have developed programs related to digital marketing that involve analyzing customer data and identifying their needs. These programs are considered essential for developing strong customer relationships (Dhoot et al., 2020).

Maintaining, developing, and strengthening customers' understanding of products and services through the analysis of available data has become one of the most effective marketing strategies. This is due to its significant impact on customers' repeat purchases (Yu et al., 2021). In addition, customer information is the foundation of any business (Jin et al., 2022). In this regard, many organizations have defined customer retention and incentive programs as part of their main activities to develop relationships, using data analysis techniques. Manufacturers and companies will be able to ensure their survival in the competitive field by keeping their consumers satisfied (Hammood et al., 2021).

Analyzing customer experience data is what distinguishes successful digital banking from failure. Meanwhile, data mining has revealed that the experience gap in digital banking refers to the negative disparity between customer expectations and the actual experience they receive from financial products and services (Yang et al., 2022). In a market-based economy, banks are compelled to utilize data mining techniques and marketing tools, as well as leverage modern marketing strategies, in order to establish a strong presence in the money and financial markets. This enables them to outperform their competitors and effectively manage their financial resources (Hailu et al., 2021). Banks that leverage modern and innovative marketing strategies, as well as data mining techniques, to increase their profitability and market share, are able to offer services and facilities that surpass those of their competitors, thereby meeting the needs of customers more effectively. In

modern banking marketing, it is important to analyze not only data, but also goals, strengths and weaknesses, policies, response patterns, customer needs, competitors' patterns, and methods (France et al., 2018). Despite the numerous studies conducted in the field of customer centricity and customer knowledge, research on customer experience in the realm of digital banking, specifically with the application of digital marketing knowledge, has remained limited. Therefore, the current research aims to identify the fundamental categories of data-oriented improvement in electronic banking customer experience and provide a practical model in this field.

Knowledge is crucial in marketing and plays a vital role in the success of a business. In the field of marketing, having knowledge enables you to implement more effective strategies and techniques to attract customers, boost sales, promote your brand, and compete with other rivals. Marketing knowledge helps bank managers to better understand their customers. By understanding the needs, problems, and preferences of customers, companies can provide better solutions and adjust their marketing strategies based on this knowledge. Effective marketing requires unique planning and strategies that differentiate the bank from its competitors. Knowledge of market trends, methods, and events enables you to capitalize on opportunities and strategically influence the market using appropriate techniques. Knowledge about your market and audience enables you to optimize marketing strategies to promote your brand. With a deep understanding of your values, personality, and brand identity, you can act in a unique and recognizable way in the market. Marketing knowledge enables you to implement strategies to attract new customers, improve conversion rates, and retain existing customers. By employing effective marketing techniques, you can enhance customer engagement and boost your sales. Therefore, having knowledge in marketing is crucial as it enables managers to develop effective strategies and achieve success for the bank.

The primary objective of this study is to close the divide between theory and practice in the field of data-driven enhancement of customer experience in the digital banking industry, utilizing digital marketing expertise. Therefore, this research aims to answer the question: What is the data-driven model of electronic banking customer experience using digital marketing knowledge?

2. Literature Review

Customer experience

The performance and power of an organization to deliver a meaningful brand experience are complex because they are fundamentally based on behavioral economics, which is a psychological view of human behavior in the area of economic decision-making that is difficult to master. Brand experience is important because it fosters brand loyalty. Brand experience is the result of analyzing data on emotions, understanding the environment, familiarity, and behavioral responses that are conveyed by stimuli related to the brand, such as packaging, communication, and environment. These elements are all part of the brand identity. Brand experience is the culmination of all touchpoints and information exchanged with an organization, which is conveyed through various channels such as social networks, websites, sales force, databases, etc. (Saini & Singh, 2019).

Knowledge of digital marketing

The classic e-marketing mix has undergone major changes, and new e-marketing platforms, such as websites, have revolutionized the way companies communicate with customers. Due to the specific skills required, such as marketing, design, and IT, companies often choose to subcontract these tasks (Baradaran, 2020). These services provide e-marketing solutions for businesses (referred to as outsourcing) and assist companies in creating an effective marketing mix to attract customers through the Internet (Ismagilova et al., 2020).

$$2p + 2c + 3s = D - \text{Marketing Mix}$$

The e-marketing strategy is created by combining classic marketing with

personalization, privacy, customer service, community, site security, and sales promotion. Unlike the traditional marketing mix, these factors have a modifying effect (Chang, 2021).

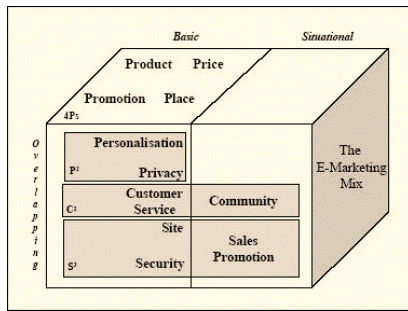


Figure 1. Digital marketing mix classification (Chang, 2021).

Khanturayev et al. (2022), in their research titled "Evaluation of Digital Marketing Tools in Attracting Customers to the Banking and Financial Services Market in Uzbekistan," demonstrated that familiarity with digital marketing tools is beneficial for enhancing customers' understanding of banks and financial matters in the market. Kasri et al. (2023), in their research titled "Digital Payment and Banking Stability in an Emerging Economy with a Dual Banking System," demonstrated the necessity of a data-driven regulatory ecosystem for ensuring a flexible banking and financial system in such an economy.

Molla et al. (2022), in their research titled "Analysis of the Use of Different Types of Bank Digital Marketing Tools," showed that the use of data-driven digital marketing tools is more effective than traditional marketing tools in the banking industry. Dwivedi et al. (2022), in a study titled "Setting the Future of Digital Marketing and Social Media Research"

This discussion will focus on this topic, topic as well as perspectives on the effectiveness more areas such as including artificial intelligence, augmented reality marketing, digital content management, marketing, and advertising. They researched mobile B2B marketing, electronic word of mouth, and ethical issues.

3. Method

The current study is an applied-developmental study in terms of its purpose, and it is a cross-sectional survey research in

terms of the method and time frame of data collection. A semi-structured interview and a Likert scale questionnaire were used to collect data. The reliability of the questionnaire has been assessed using Cronbach's alpha and composite reliability.

Convergent validity has also been utilized to validate the questionnaire. The statistical population for the qualitative part of this research includes experts and specialists in the banking industry. The sampling of the qualitative section continued until theoretical saturation was reached, and a total of 15 experts participated in this section. The statistical population consists of one million people, specifically active customers of electronic banking. The sample size of 384 people was determined using the Cochran table. In order to analyze the data in the qualitative part, the grounded theory analysis method was used in MAXQDA software to identify research indicators. Additionally, the structural equation modeling method and SMARTPLS software were utilized to validate and present the final model.

4. Findings

Based on interviews conducted using questions designed according to the grounded theory technique, six main categories were identified through secondary coding and primary codes.

Among the identified factors, the axial coding paradigm was used to establish the linear relationship between the research categories. This included causal conditions, central categories, background conditions, intervening conditions, strategies, and consequences.

Causal Conditions

Causal conditions are events or occurrences that lead to the onset or propagation of a phenomenon. In the present study, the categories of time management challenges, cost management, relationship management, appropriate decision making, business trends, and the effects of digitalization have been identified based on the participants' perspectives. These categories have also been related to a broader category called causal conditions.

Table 1. Open coding of qualitative data (causal conditions)

Axial code	Secondary code	Initial code
Causal conditions	Time Management	Planning and scheduling
		Prioritizing activities
		Increasing the speed of exchanges
		Categories of products suitable for search
	Cost management	Fast data transfer
		resource management
		Increasing Productivity
		Reducing search costs
	Relations management	Competitive prices of products
		Optimal use of social media
		Sincere communication with customers
		Useful and effective interactions and communications
	Appropriate decision	Mobile capabilities
		Purchase quality
		Freedom and flexibility in choice
		Intelligent and automatic detection of new products
	Business trends	Product recognition
		Existence of detailed information and specifications of products
		Population-based p2p lending
		Payment banks
Digitization effects	Digital wallet	
	Social media banking	
	Facilitating internal processes	
	Applicability of digital banking services	
	Improving customer performance	
		Simplicity and effectiveness
		Service automation

Strategies

Strategies are developed based on actions and reactions in order to control, manage, and provide feedback on the phenomenon

being studied. Strategies are purposeful for a reason. There are always intervening conditions that either facilitate or limit strategies.

Table 2. Open coding of qualitative data (Strategies)

Axial code	Secondary code	Initial code
Strategies	Digital contextualizing	Providing the necessary software and hardware
		Modeling of successful global examples
		Increasing organizational knowledge in the field of digital tools
		Providing organizational resources
		Creating a digital consulting team
	Culture building	Determining digital process protocols
		Empowering human resources
		Laying the groundwork for gaining public trust
		Educating customers to use digital tools
		Media culture building
	Creativity	Technology acceptance in the bank
		Encouraging employees
		Welcoming the latest technologies
		Localization of new digital marketing techniques
		Creating a platform for creativity and organizational innovation
		Opening innovation in the organization
		Innovation based on coronary heart disease conditions
Supporting organizational innovation		

Consequences

The results emerge as a consequence of the strategies. Consequences are the outcomes of actions and reactions. Consequences are not always predictable and may not align with people's intentions. Consequences can take the form of events, which can be

either negative or positive, explicit or implicit, and can occur either immediately or at a later time. It is also possible that what is considered a consequence at one point in time may become part of the conditions and factors at another time.

Table 3. Open coding of qualitative data (Consequences)

Axial code	Secondary code	Initial code
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Consequences	Customer satisfaction	Customer satisfaction
		Improving customer attitude
		Increasing customer loyalty
		Increasing the number of customers
		Customer culture building
		Positive customer experience
		Increasing customer trust
	The flourishing of the banking industry	Creating a competitive advantage
		Industrialization of Banking Industry
		Complying with global standards
		Laying the groundwork for the digital economy
		Creating a positive competitive atmosphere
		Keep up with global change
		Customer orientation based on international standards
		Digital Economy Strategies
		Improving modeling and localization
		Laying the ground for international competition
		International standardization
		International business model opportunities
	Economic efficiency	Economic growth of the country
		Reducing country costs
		Increasing sustainable income
		Integration of traditional and modern systems
		Identifying global markets
		Global customer focus
		Service optimization
		Improving banking processes
		Reducing unemployment
		Increasing the growth of the digital banking industry
		Improving the state of digital commerce
Empowering human resources		

Contextual conditions

A context is a collection of unique characteristics that define a phenomenon. It encompasses the location and events

associated with the phenomenon. The context represents a set of specific conditions in which action and reaction strategies occur.

Table 4. Open coding of qualitative data (Underlying conditions)

Axial code	Secondary code	Initial code
Underlying conditions	Digital Economy	Opening drive architecture
		Opening data policies
		Digital literacy
		Policy-making based on empirical and experimental data
		cybersecurity
		Reliable digital identity
		Reliable digital data hub
		Public infrastructure for the digital economy
	Digital tools	Micro-moment
		Social stories
		Live video
		Artificial intelligence
		Personalization
		SEO Search Engines
		Social Networks
		Voice Search
		Visual ads
		Block chain
		Influential and influential people
		Advertising
		Automated robots
		Video marketing
		Internet of Things
		cloud computing
		smartening

Intervening conditions

Structural conditions belong to a phenomenon and affect action and reaction strategies. They facilitate or limit strategies within a specific context.

Next, the obtained model was evaluated using the partial least squares structural equation technique in SMARTPLS software.

Table 5. Open coding of qualitative data (Intervening conditions)

Axial code	Secondary code	Initial code
Intervening conditions	Environmental factors	Rapid changes in global markets
		Prevalence of Covid 19 pandemic
		Economic sanctions
		The advent of virtual currency and the uncertainty of its future
		Lack of access to modern production technology and difficulty in importing devices
		Slow or low adaptability to international factors
		Exchange rate fluctuations
		Uncertain mechanisms for filing a lawsuit
	Individual factors	Slow administrative procedures
		Understanding information security
		Instability of digital business culture
		Mass behaviors
		Lack of digital business knowledge
		Traditional dominance of society
		Perceived risk
		The process slows down the confidence of people in the community

Next, the obtained model was evaluated using the partial least squares structural equation technique in SMARTPLS software.

The value of R^2 is specified for the constructs of the model (principle category, strategies, consequences). According to the three criterion values, it confirms the fit of the structural model.

$$R^2 = \frac{0.667 + 0.545 + 0.798}{3} = 0.67$$

The GOF criterion was invented by Tenenhaus et al. (2005) and is calculated according to the following formula:

$$GOF = \sqrt{Avg(Communalities) \times R^2}$$

$$(R^2) = 0.67 \times Avg$$

Therefore, based on GOF, the model is approved. For convergent validity, average variance extraction (AVE) and composite reliability (CR) are calculated. The following relations should be established:

- CR > 0.7
- CR > AVE
- AVE > 0.5

Table 7. Convergent validity and reliability of research variables

CR	AVE	Cronbach's alpha	
0.836	0.620	0.837	Causal Factors
0.810	0.618	0.722	Main Category
0.825	0.632	0.814	Contextual Factors
0.834	0.643	0.798	Intervening Factors

Figure 2. Factor loading of the research model

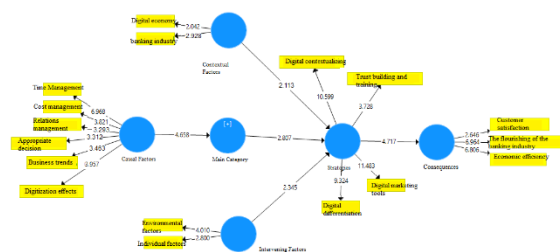


Figure 3. T-statistics of the research model

The fit indices of the model are specified in the table:

Table 6. Fit indices of the main research model

Model	X2/df	RMSEA
Acceptable amount	1-3	<0.1
Calculated	2.198	0.063

0.840	0.585	0.755	Strategies
0.829	0.604	0.803	consequences

Fornell-Larcker was used to calculate the divergent validity.

Table 8. Fornell and Locker method

	Causal conditions	Main Category	Contextual Factors	Intervening conditions	Strategies	Consequences
Causal Factors	0.867					
Main Category	0.763	0.896				
Contextual Factors	0.436	0.690	0.849			
Intervening Factors	0.601	0.645	0.759	0.855		
Strategies	0.534	0.538	0.765	0.534	0.872	
Consequences	0.489	0.510	0.738	0.418	0.613	0.840

The quality of the structural model is calculated by the redundancy index. Q2 values above zero

indicate that the observed values are well reconstructed and the model has predictive ability.

Table 9. Q2 values

	Causal conditions	Main Category	Contextual Factors	Intervening conditions	Strategies	Consequences
Q ₂	0.448	0.546	0.487	0.420	0.388	0.467

In the following, the influence of the identified factors on each other has been examined:

Table 10. Investigating the influence of the identified factors of the foundation data model on each other

Result	Significance level	t statistic	Factor load	Effect
Confirmation of relationship	0.000	4.658	0.413	Causal factors on the main category
Confirmation of relationship	0.000	2.133	0.424	Contextual factors on strategies
Confirmation of relationship	0.000	2.345	0.454	Intervening factors on strategies
Confirmation of relationship	0.000	2.807	0.313	The main category on strategies
Confirmation of relationship	0.000	4.717	0.476	Strategies on Consequences

According to the table, the factors identified in the foundation's data model have influenced one another. The factor load of causal factors on the main category is 0.413, with a t-statistic of 4.658. Additionally, the factor load of contextual factors on strategies is 0.424, with a t-statistic of 2.133. The factor loading of intervening factors on strategies is 0.454, and its t-statistic is 2.345. The factor loading of the main category on strategies is 0.313, and its t-statistic is 2.807. Finally, the factor loading of the strategies on the results was 0.476, and the TN statistic was 4.717. Therefore, it can be said that the research model has been approved.

5. Discussion

The aim of the current research was to develop a data-driven model of the customer experience in electronic banking, utilizing knowledge from digital marketing. In this research, foundation data and structural equation modeling methods have been used.

This research has been conducted by reviewing the relevant literature and utilizing previous studies to identify the factors using a combined and mixed methodology. The current research is argumentative and is based on the analysis of information obtained from the qualitative part of the study. The research also incorporates and integrates relevant literature.

Nashifar et al. (2021) also demonstrated the significance of electronic customer relationship management in enhancing customer experience in digital banking services. Karimi et al. (2012) demonstrated the significance of accessibility, ease of use, reliability, and efficiency in enhancing the customer experience in electronic banking.

Molinillo et al. (2022) showed that conducting customer needs assessments in digital banking is effective for marketing strategy. Zhang et al. (2021) investigated the effects of COVID-19 on banking. The

results showed that the epidemic had a negative impact on the financial efficiency of microfinance institutions. But digital tools have proven to be an effective strategy in mitigating the damage caused by the COVID-19 pandemic. As customer experience becomes more essential for banks, only those that modernize their IT infrastructure and offer online access to banking products and services will benefit in the future. The future of banking products and services lies in a combination of online and offline channels to cater to customers whose preferences are constantly evolving.

6. Conclusion

Banks must ensure that customers can easily adapt to receiving information on how to use e-banking. Finally, this study concluded that there is alignment between the use of electronic digital marketing tools and the customer experience of banking services of this type. By increasing the adoption of electronic banking to meet customer needs, customer satisfaction in their experience with banking based on digital marketing tools also increases. Security must be continuously enhanced to ensure the integrity of online transactions, as this will increase consumer trust. The security provisions should be clearly and comprehensively displayed on the banks' websites to enhance the credibility and reputation of the banks. Designing the optimal route based on customer data, exploring the impact of transformative technologies on contact points, and comparing human and electronic contact points are crucial areas for future research in this field. Different generations of customers perceive the customer experience in different ways.

Therefore, by tracking different generations at each stage of the customer's journey, we can understand that each one has specific requirements, different positive and negative aspects. Consequently, one of the most crucial areas for future research is comparing the expectations of different customer generations regarding digital marketing tools. This research should evaluate their

experiences and explore how to design and co-create a service path that caters to their needs in electronic banking services.

Evaluating the experience and comparing the journey of customers in different banking systems and banks, as well as comparing the experience in banks and fintechs, are important issues that need to be investigated in future research. Additionally, exploring the methods of designing customer journey maps with an emphasis on the emotional aspect of the experience is also crucial.

Technology has reduced costs in the banking industry and lowered business barriers. New business models, leveraging digital tools, have been able to transform small industries into global giants, even when their workforce consisted of only a few people. Based on the recent developments, companies that have kept up with the digital changes have been able to achieve greater success than before. Therefore, the experience of the COVID-19 pandemic has highlighted the significance of digital marketing tools in the success of the banking industry, fostering innovation, and creating a competitive advantage. In the post-coronavirus era, with the digitization of processes, it is now possible to integrate and collect various types of data. This includes information such as the amount of time users spend on a webpage, their purchasing habits, and the comments they make about their purchases. With methods based on artificial intelligence, it is possible to extract vast amounts of knowledge from this data and utilize it to retain customers, provide them with tailored products, and enhance service quality.

The research provides the following suggestions:

- This study aims to utilize databases and insights from successful banks, particularly in the Middle East, to explore the use of digital marketing tools in enhancing the service performance of electronic banking customers and creating unique value for them. Additionally, the study will compare this approach with the current model.

- Establishing a dedicated data recording unit to strategically develop digital marketing and its implementation across all policies, with a focus on targeting both micro and macro banks in the electronic and digital banking sector.

- The use of personas enables a more targeted approach in utilizing digital marketing tools to provide electronic services to legal publishers within the target community.

- Implementation and potential modifications of the presented model should be considered based on the nature and philosophy of the companies within the bank, in order to enhance the customer experience.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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