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Designing the dimensions of the maturity of the fourth industrial revolution in the supply chain of banking services and the development of digital banking with the foundation's data approach

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Abstract

The main goal of this research is to design the maturity model of the fourth industrial revolution in the supply chain of banking services and the development of digital banking with the data-based approach. The current research is, qualitative type based on strategy, and it is in the basic research categories in terms of goal. The data collection method is field research, and the data collection tool is a semi-structured interview. The participants of the current research are the senior managers of the country's banks, experts and activists in the field of digital banking, and using the sampling method, 10 people were selected as participants in the research. It should be noted that the interview has progressed to theoretical saturation. Qualitative data obtained through interviews were analyzed using the data-based theorizing method. Qualitative data analysis was done using Max Kyoda software version 2020. According to the results obtained, the categories identified in this research include ten categories in the causal conditions section, seven categories as components of the central phenomenon, four categories related to contextual conditions, eleven categories in the strategies section, and seven categories for intervening conditions. And finally, there are eight categories for the consequent part of the model.

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Extended Abstract

Introduction

In the last few years, technology has been developing rapidly and big data or mega data, computing or cloud computing, smartphones and high bandwidth are now commonplace. Examining and comparing the effects of technology in other industries shows that digital has created great changes in the status and value of the industry (Barazideh et al., 2024). There is much pressure to change and transform the banking industry. Customer experiences and expectations, technological capabilities, legal requirements, demographic and lifestyle issues, and economics all create an inevitable necessity for change. It is obvious that the digital age has had a pervasive impact on every industry and organization (Ramzanpour Osmavandani et al., 2024). Digital transformation management is the determining factor of the survival or destruction of organizations in this era, and now it is the era of transition from traditional models to technology-oriented and value-creating business models. In recent years, the new generation of banking under the name of digital banking has been operationalized in the world and the main attention of leading banks has been focused around the axis of digital transformation (Karimi et al., 2023) .

Over the years, the development of new services in the banking and financial sector has been driven by telephone banking, online banking and other forms of fintech (Hasan et al., 2020). These developments enabled the banking sector to overcome the global challenges associated with facilitating transactions across industries, thanks to improvements in accessibility, speed, efficiency, effectiveness and transparency. However, the introduction of digital banking, focusing on technologies such as blockchain, has been announced as the next evolutionary step that will transform not only the banking and financial industry, but also the nature and execution of corporate transactions (Osmain et al., 2021).

Therefore, the use of new mechanisms such as blockchain with all kinds of monetary services brings the possibility of causing widespread disruption in the banking industry. As a result, it includes activities such as facilitating international money transfers, smart contracts, digital banking, office automation and digital assets. Thus, it provides an opportunity for relevant stakeholders to contribute to the improvement of openness, trust and privacy issues. However, although blockchain technology has provided many opportunities for businesses, it is necessary to realize that there will be many problems and complexities in the areas of adoption as well as in the areas of technology and regulation. For example, the numerous risks caused by the loss of digital money and cyber security breaches are examples of recent incidents that have revealed a high level of risks associated with the use of blockchain technologies in banking and finance (Demirhan et al., 2021). According to the items mentioned above, the main question of the current research is:

How to fully recognize, evaluate and design the maturity dimensions of the fourth industrial revolution in the supply chain of banking services and the development of digital banking using a data-base approach, so that banks can use modern optimizing technologies to provide their services, improve financial performance and customer experience?

Theoretical framework

In the fourth industrial revolution, the emergence of major technologies such as artificial intelligence and the Internet of Objects has led to extensive changes in business models, among which banks have had a greater share of these developments. Despite the research conducted in the field of business model change in the fourth industrial revolution, the issue of transformation in the supply chain of banking services in the fourth industrial revolution has been almost neglected (Shahabi et al., 2021). The competition between banks and financial institutions, the emergence of digital technologies, the problems caused by

sanctions, the continuous change of customer requests and the needs of society have made planning for the development of digital banking an undeniable necessity for banks. Digital technologies (such as social media, mobile, cloud computing, Internet of Objects and other digital technologies) offer great opportunities for organizations to provide new value propositions, especially by combining their existing capabilities with new digital capabilities. In addition, digital technologies will increase user experience and create new revenue streams (Asqari et al., 2018).

Chaidar et al., (2023) in their paper investigated the dynamic relationship between fintech investments and financial performance and showed whether the size of the bank can affect its performance in the field of digital transformation (digitalization) or not. The fully modified ordinary least squares model is estimated for 23 European banks in the whole period from 2010 to 2019 and for two sub-periods from 2010 to 2014 and from 2015 to 2019. Econometric results show that fintech is positively and significantly related to bank profitability, in the sense that the more digital interaction banks have, the higher the profitability.

In their research, Avianto et al., (2024) analyzed the differences in book prices of banks based on the level of digitalization and investigated the effect of digitization and financial factors on the value of book prices of banks with digital services. The analysis of the results of this study shows that higher levels of digitalization are associated with improvements in the share of fee income, return on equity and price to book value of the bank. Additionally, the level of digitization enhances equity returns, improves non-performing loans and increases capital utilization, all of which significantly impact book value.

Zhao et al., (2024) in their study investigate the effects of corporate digitization on green transformation in listed resource-based companies in China from 2009 to 2021. The data analysis of this research shows that digital transformation significantly increases the sustainability of these companies.

Ayinaddis et al., (2024) in their study analyzed the perceived effects of digital transformation in the banking industry and identified the factors that most affect banking performance and business volume. Based on the obtained results, the strengthening of the impact of digital transformation in banking and the vital importance of employees' skills and the digital experience of shareholders have been highlighted.

Research methodology

Based on the type of data, this research is considered as a qualitative research and according to the purpose of the research, it is considered as a basic and exploratory research, which seeks to design a model for the maturity of the fourth industrial revolution in the supply chain of banking services and the development of digital banking.. The participants of the research are senior managers of the country's banks and experts and activists in the field of digital banking, 10 of whom were selected by theoretical sampling and interviewed. In selecting the samples, an effort was made to select the most knowledgeable and well-known managers. The interviews have been repeated in order to share the preliminary findings, complete, correct, revise and adjust the data.

Research findings

In the current research, according to the purpose of the research to design a model for the maturity dimensions of the fourth industrial revolution in the supply chain of banking services and the development of digital banking, the researcher has used the data-based theorizing method in the style of Strauss and Corbin. In this research, the researcher started the interviews with targeted sampling of the desired samples and questions about the maturity

dimensions of the fourth industrial revolution in the supply chain of banking services and the development of digital banking. In the central coding step, while the interviews were progressing, the relationship of the categories in the relative sampling of the codes of the interviews was determined to some extent. In the last step of selective coding, a selective sampling of the categories was carried out and according to the causal conditions raised in connection with the maturity of the fourth industrial revolution in the supply chain of banking services and the development of digital banking from the samples in connection with Phenomenon-oriented, strategies, contextual conditions, intervening conditions, and finally, the consequences of questions were asked and finally, in the supplementary stage, according to the literature of this field and theoretical foundations, the final form of the model was completed..

Conclusion

In the era of technological advancement and innovative disruption, digital banking with artificial intelligence has emerged as an alternative technology for channel management, services and online banking solutions. Although the emergence of artificial intelligence in digital banking has enriched digital banking services, the adoption of digital banking with artificial intelligence and meeting the expectations of digital banking users is still an important issue. According to the results obtained from the model presented in this article, and according to the strategies identified in this model, the country's banks can create value for customers and improve their financial performance. Also, other consequences include personalized services, structural improvement, creation of new institutions and organizations, re-engineering of processes, creation of a suitable banking business model and finally improvement of customer performance.