Journal of Computing and Electronic Information Management
ISSN: 2413-1660 | Vol. 15, No. 3, 2024

Overview of the research status of the application of digital technology in commercial banks

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Abstract: This paper mainly discusses the advantages and disadvantages brought by digital technology to the current commercial bank market. The purpose of the study is to analyze the specific application of digital technology in commercial banks and the prospect of future improvement. Through a specific analysis of the relevant studies on the promotion of production efficiency of commercial banks by digital technology, the relevant studies on the risk control role of digital technology, and the relevant studies on the marketing of digital technology, the conclusion is drawn that the application of digital technology in commercial banks has brought a lot of convenience, but it is also accompanied by technical failures, network security, data privacy, customer acceptance and other challenges. Banks need to take a multi-layered approach to these issues to ensure that digital technology can truly bring value to business development and customer service.

Keywords: Efficiency; Safety; Energy saving; Service; Value.

1. Introduction

With the rise and development of big data, intelligent AI, computer and other technologies, the traditional financial industry has been gradually broken by the development of big data, and digital technology has gradually occupied the entire commercial bank. The operation of commercial banks has been severely tested: the traditional financial bankruptcy risk model or the traditional measurement method to predict risk and control risk has considerable limitations at home and abroad; Relying on the subjective judgment of financial managers to serve customers is limited by the lack of personalized customized services and lack of experience. It is still a difficult problem for commercial banks to solve that the profit is compressed due to the high efficiency cost control that commercial banks cannot carry out. However, the era of digital technology has brought opportunities to commercial banks. With the increase of information and data, the soaring computer computing power and the increase in scientific research investment, the improvement of data processing capacity has provided a new environment for commercial banks to develop their business by using artificial intelligence, big data mining and cloud computing. At the same time, whether commercial banks can make good use of artificial intelligence, machine learning and other mathematical technologies in the contemporary market to carry out more effective risk management and control, more accurate customer relationship management, provide more personalized services, and significantly reduce and control costs determines the success or failure of commercial banks.

Compared with the operation of traditional commercial banks, the improvement of production efficiency by modern digital technology is reflected in the introduction of data analysis and prediction, personalized recommendation, operational efficiency improvement and customer experience improvement, so as to better fund management and planning, enhance customer satisfaction and loyalty, and provide more personalized and intimate service experience. The role of modern digital technology in risk control is enhanced by intelligent video surveillance systems, biometrics and blockchain applications, which can monitor activities inside and outside the bank in real time, and automatically identify abnormal behaviors such as theft or sabotage, ensure that only authorized personnel can enter the secure area, improve risk identification capabilities, and quickly respond to security incidents and take measures. Reduce loss and recovery time; Modern digital technology for the development of digital technology marketing through the development of social media and mobile applications, personalized marketing, functional integration is reflected, so that marketing is more diversified and interactive, including advertising on social media platforms, promotion and interaction in applications, to achieve a higher degree of personalized marketing, to provide customers with customized product and service recommendations. These new developments have greatly improved the operational efficiency of the commercial banking market and are an important driving force for the transformation and development of the banking industry. Digital technology not only promotes the transformation and progress of banking business at the technical level, but also profoundly changes the way of interaction and service paradigm between banks and customers, and has a long-term and far-reaching impact on the entire financial industry. Through the above Angle related research and elaboration.

2. Literature review

With the rise and development of big data, intelligent AI, computer and other technologies, the traditional financial industry has been gradually broken by the development of big data, and digital technology has gradually occupied the entire commercial bank. The operation of commercial banks has been severely tested: the traditional financial bankruptcy risk model or the traditional measurement method to predict risk and control risk has considerable limitations at home and abroad; Relying on the subjective judgment of financial managers to serve customers is limited by the lack of personalized customized services and lack of experience. It is still a difficult problem for commercial banks to solve that the profit is compressed due to the high efficiency cost control

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2.1. Relevant research on digital technology to promote the production efficiency of commercial banks

In terms of deposit business, the original commercial banks used traditional manual operation, traditional counter services, written documents and records: many banking operations rely on manual operation and paper documents; Most customers need to go to the bank branch counter for business, face-to-face communication with bank employees and handle various affairs; The recording and management of banking operations often rely on paper documents and hand-filled forms, which increases the complexity of data entry and management. This results in slower processing and higher error rates.

Nowadays, with the development of digital technology, commercial banks have reflected the convenience brought by modern digital technology in data analysis and prediction, personalized recommendation, operation efficiency, customer experience and other aspects: commercial banks can use data science technology to analyze customers' deposit behavior patterns and trends. Through data mining and machine learning algorithms, banks can predict customers' deposit behavior, such as changes in deposit amounts, seasonal fluctuations in deposits, etc., so as to better fund management and planning. Based on the results of data analysis, banks can provide customers with personalized deposit product recommendations. By understanding customers' financial status, spending patterns and savings goals, banks can customize and recommend deposit products that suit customers' needs, enhancing customer satisfaction and loyalty. The introduction of digital science and technology can optimize the bank's deposit business processes and operational efficiency. Machine learning and big data mining methods can provide commercial banks with more accurate customer relationship management. For example, when new customers apply for credit cards or loans, commercial banks can form long-term partnerships with big data companies, obtain customer travel and transaction habits at a very low cost, and use machine learning classification methods to perform customer credit scores. A more accurate conclusion on whether to approve an application can be reached. Commercial banks themselves can also carry out social network mining through crawler technology to obtain the information of new customers on social networks for credit scores, which can effectively reduce the moral hazard brought by new customers to commercial banks in the case of information asymmetry. Automated and intelligent data processing tools can reduce human intervention and improve data processing speed and accuracy, thereby reducing operational costs and accelerating customer service response times. Digital science and technology can enhance the overall customer experience. Through real-time data analysis and prediction, banks can respond to customer needs and changes in a timely manner, providing a more personalized and intimate service experience, such as customized deposit recommendations, intelligent customer service, etc. [1]

2.2. Research on the role of digital technology in risk control

In order to ensure the safety of transactions, traditional commercial banks use physical prevention and control such as safes and security doors to store cash, important documents and valuables, usually using fireproof and anti-theft design. Internal and external bank security measures, including bulletproof glass and reinforced Windows and doors. Even so, important documents are vulnerable to theft. Under the traditional credit risk management model, the pre-loan survey is based on the information provided by the customer application, and there is no other data source for verification, which leads to the quality risk of the data collected by the bank. On the other hand, the main data collected by the bank include the financial information of the borrower, the borrower's past borrowing and repayment situation, the bank card flow, the central bank credit information and other information provided by the borrower and the internal data of the loan bank. Some data banks have no legal verification. As a result, the information collected by banks in the early stage is weakened, and even leads to invalid information. [2]

Now since the intelligent video surveillance system, biometrics, Internet of Things, data analysis and blockchain technology, the prevention and control technology of commercial banks has been greatly improved: the use of high-definition cameras and intelligent analysis technology, can monitor the activities inside and outside the bank in real time, and automatically identify abnormal behavior such as theft or sabotage; Including fingerprint recognition, iris scanning and facial recognition to control the authentication of employees and visitors to ensure that only authorized personnel have access to secure areas; Connect physical devices to the Internet, such as smart door locks, sensors, and security cameras to enhance physical security through monitoring and automatic response; Use big data analytics and machine learning algorithms to monitor account activity patterns, detect unusual transactions or fraud, and improve risk identification capabilities; Provide secure means of transaction and data storage to ensure transparency and immutability of transactions and reduce the risk of fraud; Protect sensitive data stored and processed in the cloud with advanced encryption and access controls to ensure data privacy and compliance; Use automated alert systems and emergency response plans to quickly respond to security incidents and take action to reduce losses and recovery times. From a qualitative point of view, big data has the ability to handle more complex data structures, i.e. unstructured data. Banks have accumulated a large amount of unstructured data during their years of operation in the credit field. In the past, due to technical and cost reasons, unstructured data was not paid attention to. But big data technology has changed that. Take the mature Hadoop framework as an example. With the help of the HDFS data management module and MapReduce data processing module, big data breaks up the collected

structured data and unstructured data and summarizes it again. According to the established logic function, different indexes are summed up. The whole process of induction and the traditional technical background, credit approval personnel do the same thing logically, but it does not need too much human intervention. With the support of artificial intelligence and cloud computing, big data can broaden the types of data processing while improving the ability of data mining. With the large With the increase of training times of data risk control system, the ability of big data risk control will also be optimized, the bank information system will be reconstructed, the decision-making ability of the system will be improved, and the credit risk management ability will be empowered. At present, more and more banks are launching online unsecured "fast loan" products, from application to approval to loan, which only takes a few minutes to complete. Behind this is the typical application of big data technology in bank credit risk management. [2]

2.3. Related research on marketing of digital technology

In the past, commercial banks relied solely on traditional digital technologies to support marketing, such as website and email marketing, simple data analysis, and limited personalization capabilities. Traditional digital marketing relies heavily on the bank's website and email. Bank websites provide basic information and online services, while email is used to send promotional messages, account updates, etc. Traditional methods often involve basic data analysis, such as basic customer information and behavioral analysis, to develop advertising and marketing strategies. Personalized marketing is limited by technology, and most content is still in the form of mass messaging, lacking a deep understanding of customer behavior and preferences. Now, however, new technologies such as social media and mobile apps, advanced data analytics and artificial intelligence, personalized marketing, and omnichannel integration are widely used. Modern digital marketing is more diverse and interactive, including advertising on social media platforms, in-app promotion and interaction. Banks utilize advanced data analytics and artificial intelligence technologies such as predictive analytics, machine learning, and natural language processing to understand customer needs and predict behavior. Based on big data and real-time data analysis, banks are able to achieve a higher degree of personalized marketing and provide customized product and service recommendations to customers. Modern digital technology allows banks to achieve omnichannel integration, where customers can interact across multiple platforms and devices and maintain a consistent user experience. How to retain the existing customers of commercial banks is also worth repeated consideration, in which it is crucial to improve service quality while conducting dynamic communication with customers [3]. Cluster analysis is applied to customer communication, and artificial intelligence agent technology is used to help users choose the best service and carry out repeated communication. The specific performance is as follows: Analyze the occupation of the user and find the general characteristics, store and update the relevant preferences of the user, translate the user request in the service level specification parameters, and communicate with the service provider about the high-quality service required, while monitoring the real-time quality, comparing it with the communication results, and obtaining the alternative letter of the user in the decision.

3. Conclusion

In short, the application of digital technology in commercial banks has brought a lot of convenience, but it is also accompanied by technical failures, network security, data privacy, customer acceptance and other challenges. Banks need to take a multi-layered approach to these issues to ensure that digital technology can truly bring value to business development and customer service.

4. Shortcomings and deficiencies

Through different perspectives of commercial banks, we learn that digital technology plays an important role in the growing development of commercial banks. The application and development of digital technology is related to the efficiency of commercial banks in deposit business, sealing and control role, digital technology marketing and other businesses. But at the same time, the application of digital technology also has some drawbacks, such as employment problems, network security risks, customer experience problems and so on. In view of these problems, people began to discuss and study solutions. Employment issues - Digital technologies rely on complex systems and software, and technical failures can result in system outages, service unavailability, or business stagnation. For example, a failed system upgrade or server crash may cause a transaction to be delayed or unable to proceed. One can build strong technical support teams and regular system backup plans to respond quickly to technical issues. System redundancy can also be designed to ensure that the backup system can continue to operate in the event of a failure of the primary system. To solve the problem of network security, people can take measures to strengthen network security: adopt advanced firewall, intrusion detection system and encryption technology, and regularly conduct security audit and vulnerability scanning. In the face of customer experience problems, people can design friendly user interface and process, simplify customer operation steps, establish customer feedback mechanism, collect user experience opinions and constantly improve services to ensure customer experience.

References

[1] Li Jia Internet Big Data Artificial Intelligence Machine Learning Commercial bank innovation F832.33 Document ID: A Article No.: 1006-1770(2018)012-031-06

[2] Liu Shaobo Financial Technology; Big data technology; Bank credit risk management; F490.5A 1002-6924(2020) 12-0121-08

[3] Jrad Z, Krief F, Dehni L, et al. Artificial Intelligence Techniques in the Dynamic Negotiation of QoS: A User Interface for the Internet New Generation[M]. Autonomic Networking. Springer Berlin Heidelberg, 2006:146-158. ,57 (1): 73-78.