

Analysis of the Impact of Legal Digital Currencies on Bank Big Data Practices

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Abstract: This paper analyzes the advantages of legal digital currencies and explores their impact on bank big data practices. By combining bank big data collection and processing, it clarifies that legal digital currencies can enhance the efficiency of bank data processing, enrich data types, and strengthen data analysis and application capabilities. In response to future development needs, it is necessary to strengthen data collection management, enhance data processing capabilities, innovate big data application models, and provide references for bank big data practices, promoting the transformation and upgrading of the banking industry in the context of legal digital currencies.

Keywords: Legal digital currency; Bank big data; Data processing efficiency; Data analysis and application; Countermeasures and suggestions

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1. Introduction

Legal digital currencies, issued by central banks, possess a high legal status and have a profound impact on bank big data practices. Banks, as fundamental components of the financial system, hold massive amounts of customer data. Exploring the influence of legal digital currencies on bank big data practices and analyzing their role in data collection, analysis, and application can provide valuable insights for banks in their big data practices within the legal digital currency landscape^[1].

2. Advantages of legal digital currencies in bank big data practices

2.1. Significant improvement in data collection efficiency and accuracy

Based on blockchain technology, legal digital currencies record every transaction in real time within a distributed ledger, ensuring data immutability. Banks can acquire transaction data directly from the blockchain, eliminating the need for tedious data integration processes and enhancing data collection efficiency. The guaranteed data

accuracy enables banks to promptly grasp market dynamics and demands, supporting informed decision-making ^[2].

2.2. Enrichment of data types and improvement of data quality

In addition to basic transaction information, legal digital currency transactions generate a wealth of related metadata, such as transaction time, location, and devices. This provides banks with a comprehensive and three-dimensional customer portrait, facilitating a deeper understanding of customer transaction behaviors and risk preferences. The high credibility of legal digital currency transaction data allows banks to accurately evaluate customer credit status, elevating the value of their data ^[3].

2.3. Enhanced data processing and analytical capabilities

Legal digital currencies exhibit decentralized and distributed storage characteristics, reducing the complexity of data processing. Banks can leverage blockchain technology to achieve rapid data synchronization, improving processing efficiency. The highly standardized nature of legal digital currency transaction data enables banks to effortlessly utilize various data analysis tools for deep mining and analysis, uncovering hidden patterns and providing a scientific basis for decision-making ^[4].

2.4. Expansion and innovation in data application fields

The introduction of legal digital currencies presents banks with diversified application scenarios. By utilizing legal digital currency transaction data, banks can construct complex network relationship graphs to analyze customer financial interactions and fund flows, identifying potentially high-value customers. Combining the advantages of legal digital currencies, banks can explore new business models such as cross-border payments and supply chain financing based on blockchain technology, offering efficient and secure financial services to customers. This enhances bank competitiveness and drives innovative development in the financial industry ^[5].

3. Legal digital currency countermeasures suggestions for banks' big data practices

3.1. Strengthen data collection and management

Using the real-time transaction characteristics of legal tender digital currency, establish a real-time data collection system to ensure that every transaction information is captured instantly. Banks are required to establish close cooperation with digital currency issuers or relevant payment platforms to achieve real-time data synchronization. Integrate internal business systems and external data sources to form a unified data warehouse. Eliminate data silos, increase the value of data availability, and the integrated data can provide banks with comprehensive market insights. Implement strict data cleansing and validation processes to eliminate erroneous and incomplete data. Check data formats, data types, and the like, to ensure data accuracy ^[6].

Develop clear data quality standards to standardize the data collection and processing process and improve the level of data quality. Adopt encryption technology to encrypt the collected data and ensure data security in storage. Establish a data backup and recovery mechanism to cope with data loss and damage ^[7]. When using customer data, the bank obtains the explicit consent of the customer and follows the principle of minimum necessity to use business-related data. Establish a perfect data access management system and divide the rights of employees at different levels. Ensure data compliance and prevent data leakage. Improve the data governance system, such as data quality management, data security management, and data life cycle management. Standardize the process of data use and improve data utilization ^[8]. Pay attention to the introduction of data analysis talents and establish a

data analysis team. Explore the innovative application of data and use data analysis to optimize business processes, improve customer experience, develop new products, and many more.

3.2. Improve data processing and analysis capabilities

Adopt distributed computing frameworks, such as Apache Hadoop and Spark to achieve rapid data processing and storage. Support parallel processing of large-scale data sets to significantly improve data processing efficiency. Respond to the real-time demand of legal digital currency transactions and deploy real-time stream processing systems such as Apache Kafka, and Flink. Capture and analyze data streams in real-time to provide banks with instant market insights. Construct a data storage system combining a data warehouse and a data lake for storing structured data and supporting rapid query analysis. The data lake is used to store unstructured data and provide data sources for advanced analyses such as deep learning and machine learning^[9]. Advanced statistical analysis methods, such as regression analysis and cluster analysis, are used to dig deeper into data association laws. Help banks understand customer behavior, predict market trends, and provide a scientific basis for business decision-making. Construct intelligent models to achieve intelligent customer profiling, credit scoring, fraud detection, and other functions.

Adopt advanced visualization tools, such as Tableau and Power BI, to present complex data analysis results intuitively. Improve the data governance system, such as the management system for data standards, data quality, and data security. Strengthen the data quality monitoring mechanism, and regularly check and assess the quality of data realization. Attach importance to the introduction of data analysis talents, and regularly organize data analysis training courses to improve employees' data analysis skills. Encourage employees to participate in external training to improve the overall level of the team. Form a cross-field data analysis team, such as experts in statistics, computer science, and other fields. Give full play to the advantages of experts in various fields to improve the accuracy of data analysis. Set up data analysis awards and provide promotion opportunities to encourage data analysts to be innovative and enterprising and contribute more to the bank's big data practice^[10].

3.3. Innovative big data application models

Taking advantage of the real-time nature of legal tender digital currency transactions, banks build real-time monitoring systems to instantly analyze transaction data and identify potential risk signals. With machine learning algorithms, the system automatically learns and adapts to market changes to improve risk identification accuracy. Digging deeper into customer credit history, transaction behavior, and other information to provide a scientific basis for credit decision-making. Formulate dynamic risk management strategies and adjust risk exposure measures promptly according to changes in the market environment. Helps banks safeguard funds and improve operational efficiency. Use legal digital currency transaction data to build a fine customer portrait, such as information on customers' consumption habits, risk preferences, and investment intentions. Based on customer profiles, the bank implements precise marketing strategies to provide customers with personalized service recommendations and improve marketing effectiveness.

Create an intelligent customer service system to provide customers with 24/7 online consulting services. Predict customer problems, prepare solutions in advance, and improve customer service response speed. Deeply understand customer preferences and customize financial products for customers. Construct an open banking platform and carry out in-depth cooperation with third-party organizations, fintech companies, and others. By sharing data resources and building application scenarios, the bank expands its business scope and improves

service quality. It helps banks attract more customers and partners and jointly promote the prosperous development of the financial ecology. Utilize the advantages of digital currency technology to innovate payment clearing models and improve payment efficiency. Develop cross-border payment solutions based on digital currencies to reduce cross-border transaction costs and time. Explore new business growth points and develop financial products and services. Adopt data analysis to optimize business processes and improve operational efficiency. Always pay attention to the protection of data security and privacy, improve the data security management system, and adopt data encryption, access control, and other technical means to ensure the security and privacy of customer data.

3.4. Improve the regulatory system

Given the characteristics of legal tender, banking regulators have formulated targeted regulations to clarify compliance requirements for data collection, storage, and processing. Covering data security, privacy protection, anti-money laundering, anti-terrorist financing, and other aspects, to ensure that banks have laws and regulations to follow in the practice of big data. Promote the development and improvement of data standards and specifications, such as data format, data quality, and other aspects of the requirements. Ensure that banks adopt uniform data standards in big data practices to improve data readability and facilitate supervision. Establish a data classification and grading system to implement different regulatory measures for different categories of data. Make full use of the advantages of big data technology to comprehensively supervise banks' big data practices in real-time. Build a big data regulatory platform where regulators monitor bank data flows and data processing to identify potential risk issues on time.

To improve regulatory accuracy, bank regulators introduce artificial intelligence technology to intelligently regulate banks' big data practices. By training intelligent models, regulators automatically identify abnormal data and potential risks, providing a scientific basis for regulatory decision-making. Strengthening regulatory effectiveness, banking regulators promote the establishment of cross-agency data-sharing mechanisms. By sharing data resources, regulators can have a comprehensive understanding of banks' big data practices and respond to cross-institutional and cross-market risk issues promptly. Strengthen coordination with international regulators to jointly develop regulatory standards and ensure that domestic and foreign banks follow uniform regulatory requirements in their big data practices. Establish a close collaboration mechanism with other business departments to interface with business needs. With cross-departmental communication and cooperation, regulators can gain an in-depth understanding of banks' big data practices and provide support for the formulation of scientific regulatory policies. Give full play to the role of industry associations to guide banks to strengthen self-regulation in big data practices and comply with regulatory requirements. Adapting to the requirements for the development of legal tender and big data practices, bank regulators have strengthened the training and education of supervisory personnel.

Organize training courses, seminars, and exchange activities to improve the business capacity of supervisory personnel so that they can perform their supervisory duties. To make up for the shortcomings of supervisory personnel's professional knowledge in the field of big data, banking regulators actively introduce professionals with relevant backgrounds. Provide regulators with new ideas and methods to promote innovation and development of regulatory work. To stimulate the enthusiasm of regulators, bank regulators should establish a reasonable incentive mechanism. Set up a reward system, provide promotion opportunities, among others, to encourage supervisors to learn and progress, and improve the regulatory system to contribute.

4. Conclusion

In summary, the rise of legal digital currencies has brought profound impacts on the practice of big data in banking. It has changed the operational model of traditional banking businesses and driven innovation and upgrading in areas such as data collection and processing. With the widespread application of legal digital currencies, banks can accurately grasp customer needs, optimize business processes, and improve service quality. However, the application of legal digital currencies has not been smooth sailing, posing many challenges to the practice of big data in banking, such as data security, privacy protection, technology updates, regulatory compliance, and other issues. It requires the joint efforts of banks, regulatory authorities, and various sectors of society to gradually address these challenges through strengthening technology research and development, improving regulatory cooperation, and enhancing the construction of regulations. In the future, banks should keep pace with the times, actively embrace new technologies and challenges, and optimize big data application models. Regulatory efforts should be strengthened to ensure that banks always follow the principles of compliance, safety, and efficiency in their big data practices, contributing to the prosperity of the financial market.

Disclosure statement

The author declares no conflict of interest.

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