Bigdata Analysis Implementation in Financial Field: Evidence from China Merchants Bank & Ant Group

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Abstract. Contemporarily, with the growing demands for data analysis, bigdata and machine learning scenarios are proposed in various aspects in order to handle the issues. Especially in finance field, the analysis approach could rapidly and directly increase the efficiency of daily issues as well as reduce the traditional cost. In addition, it can help to distinguish the risk, dig out the logic chain, as well as evaluate the value in not only bank industry but also the insurance, stocks as well as the Fintech corporations. This study chooses two cases to analysis the measures as well as the routine to add the bigdata approaches into the corporation business mode and daily issues. To be specific, the Ant and China Merchants Bank are selected as the two target companies. Moreover, the limitations as well as the defects as well as the future prospects have been given. Overall, these results shed light on guiding further exploration of implementation the state-of-art bigdata analysis techniques and concepts into finance field.

Keywords: Machine learning; Commercial bank; Bigdata Analysis.

1. Introduction

As a matter of fact, the bigdata and machine learning has become a widely adopted techniques among various fields on account of the boosting of data volume from lots of devices [1-4]. On this basis, it has brought novel concepts and ideal applications to plenty of industries. To be specific, it can be used to realize the face of different human beings, i.e., forming a specific crypto ID. Among the rapid implemented fields, the financial industry is also one of the areas that benefits a lot, from bigdata banking (credit recognition; washing money detection etc.), underlying assets forecasting, as well as the target clients searching for sales [5].

In reality, with the help of bigdata technique, the environment as well as demands have been greatly changed. In retrospect, it is witnessed that the bigdata techniques have been adopted to the finance fields. With this in mind, we focus one of the parts of finance and technology cross-regime corporations to discuss the applications and meanings of it. In this case, this study will detail discuss the basic modes of bigdata analysis in the regime of Finance as well as vividly demonstrate with two specific corporations, i.e., the Ant group and China Merchant Bank.

2. Bigdata Analysis in Financial Field

Big data technology is widely used in the financial industry. The following will introduce the application of big data technology in banking, securities, insurance and other financial segments. Many Chinese banks have begun to use big data to drive business operations. In the previous approach, banks' judgment of the default risk of corporate clients was mainly based on historical static data, such as past credit data and transaction data. The biggest drawback to this approach is its lack of foresight. Because the important factor affecting enterprise default is not only the historical credit status presented by the enterprise, but also the overall development form and real-time business status of the industry. The intervention of big data means that credit risk assessment is closer to reality. The integration of internal and external data resources is the basis of big data credit risk assessment. Generally speaking, in the process of determining customer demand, evaluating customer value,

judging the strengths and weaknesses of customers and predicting whether customers may default, commercial banks not only need to rely on their existing customer information, but also need to rely on external institutions' information such as credit investigation, customer public evaluation, business operation, income and expenditure consumption, and social relations. In addition, banks can use big data technology to form a relationship chart between enterprises based on investment, holdings, loans, guarantees and the relationship between shareholders and legal persons, which is conducive to the analysis and risk control of affiliated companies. By establishing relevant links between data and organically organizing fragmented data through knowledge maps, it makes data easier to be analyzed. Moreover, it is feasible to be adopted to understand abnormal communication dynamics, assess supply chain health, and provide reference loans for companies to prevent wind blows [5].

As for security, bigdata analysis can be used for stock market prediction. It can understand the trading behavior of individual investors, development trend and investment confidence and state changes, market expectations and current risk appetite can predict market conditions. The securities industry has its own characteristics. Unlike the indirect nature of the measurement of the value of products and services in other industries, the investments and returns of clients in the securities industry are directly and objectively presented in monetary form. Investment models devised by Nobel Prize-winning economist Robert Schiller are still in use in the industry. In the model, he mainly involves three variables. Intelligent consultants use intelligent systems to automatically complete customer data collection and analysis, investment planning, implementation and follow-up maintenance. They have low barriers to entry and low rates, so they can offer customized services to more retail customers.

3. Ant Group

Ant Group is a Chinese technology company that provides a range of financial services and technology offerings, including mobile payments, online banking, wealth management, and insurance. Ant Group is known for its innovative use of cutting-edge technology, including machine learning (ML), to improve its products and services [6]. In this essay, we will introduce Ant Group and discuss some of the main ML implements used by the company, with credible references to support our claims. Ant Group, formerly known as Ant Financial, was established in 2014 as an affiliate of the Chinese e-commerce giant Alibaba. The company started with the Alipay mobile payment platform, which quickly became the most popular mobile payment service in China, with over 700 million active users. Since then, Ant Group has expanded into other financial services, such as consumer lending, wealth management, and insurance, as well as technology offerings, such as cloud computing, blockchain, and artificial intelligence (AI).

Ant Group uses NLP to analyze text data, such as user feedback, social media comments, and customer support interactions. By using NLP, Ant Group can extract insights from unstructured data and gain a better understanding of customer needs and preferences. For instance, Ant Group's Alipay app uses NLP to analyze customer feedback and improve its user interface and product offerings. Ant Group uses computer vision to analyze images and videos, such as identifying objects and faces in photos and videos for its payment verification system. For example, Ant Group's facial recognition technology is used to verify users' identities when they make transactions through Alipay. Computer vision also helps Ant Group to detect fraudulent activities, such as fake ID documents and manipulated images. In addition, it has a large requirements for bigdata storaging as shown in Fig. 1 [7].

Ant Group employs recommendation systems to personalize user experiences and make relevant product recommendations. For example, Ant Group's consumer lending platform Huabei uses a recommendation system to suggest credit limits and interest rates for users based on their credit history and spending behavior. Ant Group also uses recommendation systems to promote its financial products, such as mutual funds and insurance, to customers based on their financial goals and risk profiles. Ant Group uses machine learning algorithms to detect fraudulent activities, such as phishing

scams, credit card fraud, and account takeover attempts. By analyzing large volumes of data and detecting patterns and anomalies, Ant Group can quickly identify and prevent fraudulent transactions. For example, Ant Group's risk management system uses machine learning to detect and block suspicious transactions in real-time [8, 9].

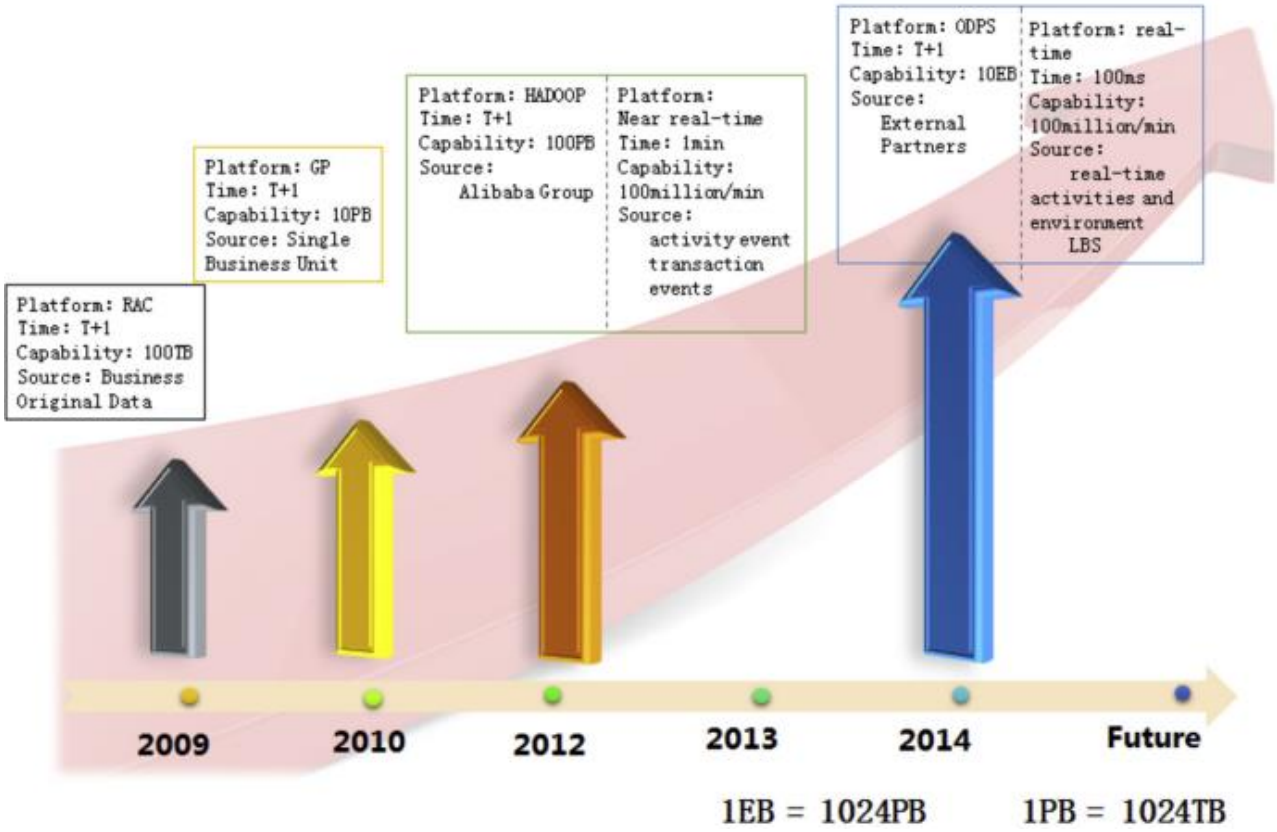


Fig 1. Bigdata Requirements of Ant Group.

4. China Merchants Bank

In recent years, with the continuous development of artificial intelligence, artificial intelligence has been continuously applied in the financial sector. And machine learning continues to be applied in the financial industry to improve and increase the accuracy of its work. The financial industry uses machine learning methods to study the mechanisms of systemic risk outbreaks and contagion in financial networks, thereby improving the regulation of markets and industrie. Fig. 2 shows the basic type for bigdata analysis while Fig. 3 gives the distributions for functions and the Fig. 4 presents the potention applications. This Section will specifically analyse how machine learning has been practised and applied to the financial sector through the combined application of investment banking and mechanical learning.

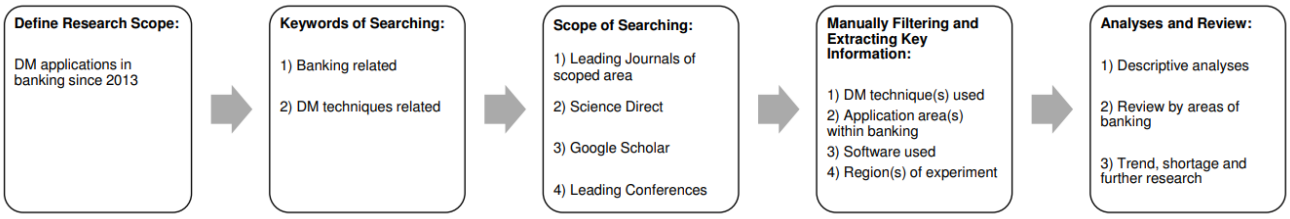


Fig 2. Framework for bigdata analysis in banking.

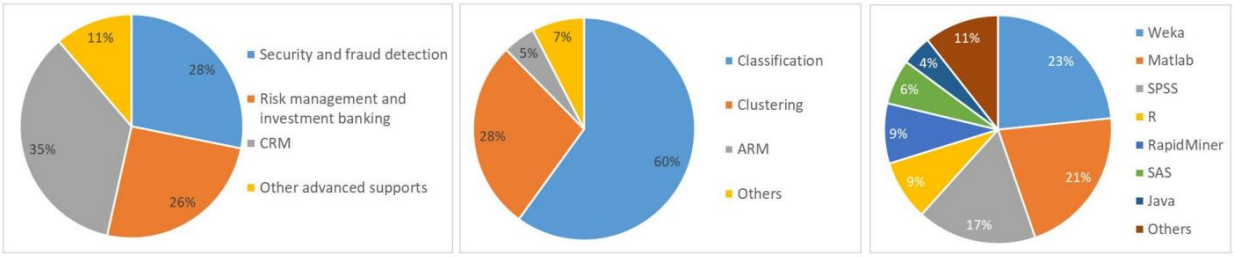
China Merchants Bank, one of China's leading commercial banks, primarily engaged in industries related to financial services, is a bank that actively explores and applies machine learning technology.

Through fundamental research, we have learned that China Merchants Bank improves its part of the business by applying machine learning.

China Merchants Bank employs machine learning algorithms to analyse multi-dimensional data, such as customer information, credit history, and historical transaction records, to assess and anticipate the credit risk of clients by developing intelligent risk control models. And therefore, the risk of non-performing loans is reduced and credit risk is effectively managed by China Merchants Bank. China Merchants Bank analyses client data using machine learning technology to create individualised product suggestions and tailored marketing plans based on customers' behaviour patterns, preferences, spending patterns, and other data. As a result, China Merchants Bank is able to optimise its marketing efforts and build client trust and loyalty while also increasing customer stickiness and happiness.

Machine learning technology is used by China Merchants Bank to analyse massive amounts of historical data, spot patterns and trends, and then optimise portfolios and manage risk using this knowledge. Due to its improved understanding of market developments and investment opportunities, Zhao Bank is able to manage its investments more effectively and generate higher investment returns. China Merchants Bank has developed a risk warning system using machine learning algorithms to monitor market dynamics and trading behaviour in real time, identify unusual transactions and possible dangers and move swiftly to intervene and control them. This aids the bank in establishing a sound risk prediction system, protecting the assets of its clients, and enhancing its risk management capabilities and levels [10].

Machine learning is used by China Merchants Bank to identify fraud and prevent money laundering in transactions. Machine learning algorithms can recognise unusual transactions and probable fraud by analysing multi-dimensional data such as consumer behaviour and transaction patterns. They can then take prompt action to intervene and manage these unexpected transactions. As a result, China Merchants Bank can use logical algorithms to detect fraud and prevent customers from engaging in money laundering. China Merchants Bank has improved its financial services through the use of machine learning technology through the aforementioned applications and has also served as an example and resource for other financial organisations [11].



(a) by topics (b) by DM techniques (c) by software

Fig 3. Functions for bigdata analysis in banking.

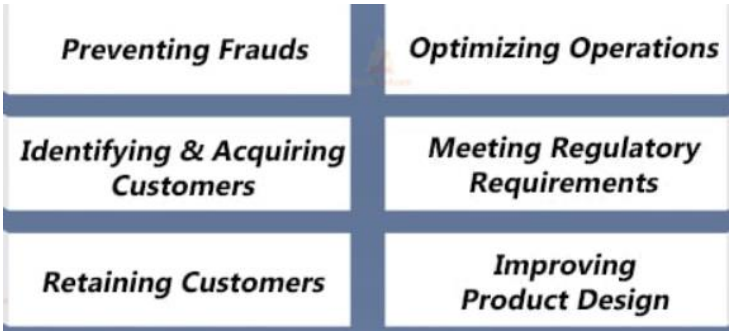


Fig 4. Potention of Bigdata Banking

5. Limitations & Prospects

While big data has brought about significant advancements in the financial industry, there are still some limitations that need to be addressed. These limitations are particularly relevant in the context of Ant Group, given its focus on financial services and the extensive use of big data in its operations. In this essay, we will discuss some of the limitations of big data in the financial field, with a specific focus on Ant Group. One of the limitations of big data in the financial industry is related to data quality. While big data enables the collection and processing of large volumes of data from various sources, the quality of this data can vary significantly. Incomplete, inaccurate, or outdated data can result in incorrect insights and conclusions, which can negatively impact decision-making. For example, if Ant Group's machine learning algorithms are trained on data that is biased or incomplete, it could lead to inaccurate credit risk assessments or investment recommendations.

Another limitation of big data is related to privacy and security concerns. The financial industry deals with sensitive and confidential data, such as personal and financial information, which is subject to regulatory requirements and privacy laws. If the data is compromised or misused, it can result in financial and reputational damage for the company. For instance, Ant Group has faced regulatory scrutiny over its collection and use of user data, which has led to the suspension of its IPO in 2020.

A third limitation of big data is related to the potential for algorithmic bias. Machine learning algorithms used in the financial industry are trained on historical data, which can reflect and reinforce existing biases and inequalities. For instance, if the historical data used to train Ant Group's algorithms is biased against certain groups, such as women or minorities, it can result in discriminatory outcomes, such as lower credit scores or higher interest rates.

In conclusion, while big data has brought about significant advancements in the financial industry, it is not without its limitations. These limitations are particularly relevant in the context of Ant Group, given its focus on financial services and the extensive use of big data in its operations. To address these limitations, companies like Ant Group need to invest in data quality, privacy, and security, as well as ethical and unbiased use of machine learning algorithms.

6. Conclusion

In conclusion, this paper investigates and discusses the implementation of bigdata and machine learning scenarios in fianance field based on two selected targets, i.e., Ant Group and China Merchant Bank. The basic descriptions for the implementations of the techniques are descibed. According to the analysis, this bigdata techniques help to reduce the cost of the company as well as boost the efficiency at the same time. At the same time, the limitations of the current state-of-art techniques are discussed as well as present the future prospects correspondingly. Nevertheless, the investigation targets in this study are limited. Further study should take into consideration of more targets, Overall, these results offer a guideline for bigdata implementation.

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