Implementation of Big Data Analysis in Banking Management Reform, Action Aid and Risk Control

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Abstract. As a matter of fact, Commercial banks are economical institutions making money by taking deposits, lending loans and investing. In previous, banks were hard to deal with data created in every daily processes. Big data mining technology is a hi-tech tool helping collecting, storing and analyzing a huge amount of information swiftly. It is been proved powerful in analyzing the reality and making predictions. In recent years, commercial banks applied the big data mining to deal with both information created in their own processes and in the Internet. The big data mining helps commercial banks to complete their digital reforms to access efficiency. According to the analysis, big data mining also aids banks' operations as well as control the risks. To sum up, the big data mining technology is changing the management of bank. Overall, these results shed light on guiding further exploration of big data implementation in finance field.

Keywords: Bank, Finance, Big Data, Economic, Management, Digital Reform.

1 Introduction

Commercial banks play an important role in modern economic system as financial intermediaries. The common services of banks are as follows. Firstly, big banks need to take deposits and keep them for times from families or companies who has spare money. These deposits can be borrowed to others with interest payment. However, the interest rate to different customers will not be the same while banks will evaluate the commercial value of each depositor and borrower and set different interest rates for each of them [1]. For example, while big companies with high reputations or patrons will enjoy lower loan rate because this kind of loan have less risks but poorly managed companies will have a higher one [1]. To complete this circumstance, banks need to collect personal information about their customers and analyze them [2]. Apart from storing savings and lending loans, banks are also creating mediums of exchange to convenient for deals like bond and fund [3]. Nowadays, traditional bank has faced many challenges. While development in traditional business area like loans is encountering many bottlenecks, new internet companies, e.g., Alibaba, Google and Paypal are trying to substitute the area of traditional banks [4].

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To face challenges and achieve new development, it is quite necessary for traditional banks to have technical innovation. Applying big data mining technology can be a practical choice. Some banks have already used big data and achieved mush progresses. Marr and Bernard researched on Royal Bank of Scotland and found that big data can break the information-gap between each single human managers and help analyzing customers need to improve customers experience [2]. Yurcan and Bryan found that big data technology can help community banks to gain the same analyze ability as giant banks in implementing sophisticated pricing [5]. Hani et al. used TOE models to study commercial banks in Jordan and found evidences to support that banks which is applying big data technology will perform better [6].

The approaching of the digital age is not only changing the normal lifestyle, but also changed the way of managing companies. Big data mining technology offers banks an important chance to reconstitute their processes and structures to enhance efficiency and improve analyze abilities. This study will overview some research result in the usage of big data mining in bank area in recent years and enumerate three most popular big data mining models in bank area. The first part will focus on how do big data break information-gaps and improve banks' management. The second part will focus on how to use big data mining to manage investing and attract more customers. The third part will mention risks controlling with the help of big data mining technology. Some predictions and wishes in the research area of the big data mining usage in banks will be mentioned in the last.

2 Basic Description

Big data technology is a collective name of a group of technology to collect, store and analyze a huge amount of information which cannot be dealt in previous times [7]. In the digital age, innumerable data has been creating day and night. While one just simply stored or dropped them in previous times limited by technology, the big data mining offers a opportunity to change digital trash into treasure. By using big data to collect, store, process and analyze information, companies may improve their understanding about the market or their own process management to lift the efficiency and gain competitiveness [8].

The proceed of big data analyze is mainly contained these parts. Firstly, all the information will be collected and stored [8]. According to the amount and type of the data, engineers should select suitable database structure [8]. Appropriate and valuable will be selected and cleared up, which is called sharping [8]. In the last, engineers use the model and data to get the result. Based on different functions, big data models can be mainly classified into three types, describing model, forecasting model and prescriptive model [9]. The describing model will transfer complex and mass data into acceptable information [9]. Forecasting model will use Machine Learning technology or simulation to predict the trend. Prescriptive model can be considered as a mixed of forecasting model and describing model, which will evaluate possible result based on analyzation on reality.

A huge amount of data is being created through the operation of banks, from bankbooks and dept to depositors favor and information about borrowers' management. This information may be just been stored at each branch banks or even remembered by human managers [2]. This structure caused many information-gaps between basic level of banks and headquarters and it is hard for head managers to make decisions or reform without enough correct and timely information. Additionally, after the innovation of digital technology happened, some irrelevant information in previous can be valuable for banks after analyzing by the big data including online purchase records and people's standpoints on hot issues [6]. Commercial banks should arrange their loan and deposit interest rates to balance gaining profits and customer relationship management. Complex plans of investing should also be arranged by banks to make more profits and lower the risks, which is challenged traditional human-based decide abilities a lot [1]. Furthermore, banks are deeply correlated to modern economical system [2]. This is important for banks to take social responsibilities to avoid economic crisis with the help of big data.

3 Management Reform

With the help of big data mining technology, banks can improve their ability in collecting all the data created in banks' running processes and get more information in the social media to increase the management and make the bank itself more attractive for customers. There exists management dilemma in traditional banks about all the branches are autonomous while headquarters are not able to supervise or improve the management in basic levels of the bank. Take Royal Bank of Scotland for example, each customers will normally be served by relatively regular manager and the manager will use their own way to select valuable information to keep and make decisions independently [2]. The quality of services was mainly depended on managers' personal ability. Additionally, most of customers' personal information were stored in each sub-branches but there were few information exchanges between them, which caused much inconveniences when customers have cross-branches service needs and made more errors [2]. Meanwhile, the main type of bank services has been changing. Fewer people choose to step in sub-branches in the neighborhood in communities in person, but deposit or withdraw money through digital ways like websites or mobile applications, which create more information and more possibilities for banks to design their services which are hard to dealt with by traditional ways [10].

However, the application of big data mining can make progresses in solving these problems mentioned. A database called cloud is set where most of information is collected, stored and analyzed by the help of big data mining technology [2]. As online banking services are becoming more popular nowadays, valuable information is easier to collect from terminal digital devices than previous [6]. Firstly, big data create more information flows across different levels and sub-branches. Because all the data is uploaded in the cloud, sub-branches can request data uploaded before without collecting cyclically and vertical management can substitute many useless mange levels to improve the efficiency [2]. Secondly, social scientists analyze data

easier with all data have already been collected in the cloud to make better development and reform planning [2]. Thirdly, big data analysis technology can deeply integrate with the usage of digital devices [6]. Only big data can handle the amount of data created by applications and websites on personal computers and mobile phones, so that banks can cut most human costs [6]. In conclude, big data hugely improved banks' information collecting ability end in efficiency improvement.

4 Action Aid

Big data analysis helps banks to break through limits in planning ability to make more profits and attract more customers. Investing used to be considered as to one of the most technical work for the bank. The main difficulties are the lack of information about potential investing choices, avoid being misled by liars and predict the future development. However, big data mining can help investors to better find and evaluate investing chances and aids them to make better decisions which are proved to more accurate by only make decisions buy human [6]. When the Internet has already deeply connected the whole world, big data can grasp information via Internet and find opportunities [5]. The big data technology is also been applied evaluate the real manage condition and predict the future development to calculate prospective earnings [5]. The big data mining has also shown its plan ability that is far beyond human by evaluating and combing a huge amount of information together when making extremely complex invest combinations [6]. Additionally, big data technology creates more chances for small banks [5]. While small banks are not able to afford a huge team of economists, statisticians, and other professional consultants, third-part suppliers will offer them helps to by a timely, accurate and detailed report made by big data mining technology [5]. For the fields of short-tern financial products trading, big data technology is also used in auto-trading to free more human and seize the most profited point [6]. Except investing, big data mining technology are also applied in designing personal services plan designing to create more kinds of services and attract more customers. In traditional, customer managers will serve every customer and make policies by based their own experiences [10]. However, the big data will draw images for each customer. All the browsing, shopping, and commenting records can be collected and analyzed which can be used to figure out customers personalities and preferences [6]. For the customers who are easy to be lost will be detected at a very early time and more personal retention will be offered which are also suggested by big data [10]. Additionally, personal advertisement will be pushed to person who are most likely to be interested about it, which are more accurate and efficient than traditional advertisement to attract customers [6].

5 Risk Control

Losses in investment, run on a bank and failed in collecting loans are most common and serious risks. These kinds of blows will not only cause profit losses to commercial banks' own stockholders, but to influence the economics of the whole country as

well [3]. In 2007, the subprime crises caused huge losses worldwide, which can be considered as the most serious economic crises after the II World War [11]. The main cause be analyzed as the loss of control in the risk of releasing loans and lack of supervision from the government [11]. To avoid these kinds of risks, happen again, big data mining can help both banks and regulators to improve their risk control abilities. Big data mining can be applied to calculate the best loan rate, which can eliminate impacts from human managers' greedy and avoid much risks [1]. Moreover, big data mining can automatically trace every trading record and give bank warnings about abnormal behaviors about money laundering or accounting fraud [6]. Banks can also use the forecasting function of big data mining technology to avoid put much money in an overheated market to avoid losses [6]. Furthermore, big data mining is not only can be used by commercial banks, but also regulators. Relevant government departments can use big data mining to evaluate the economic conditions and making policies timely to limit banks to avoid economic crises [11].

6 Limitations & Future Outlooks

The big data technology is not only having attributions, but have suffered from many criticisms as well. The big data model needs to get as much as data to create accurate reports. All the records on the Internet will be collected by models of each bog data companies. However, critics considered it likes a big camera monitoring every people all the time, which is deeply infringe the privacy right of normal people [6]. Afraid of being caught in moral controversy, banker have not fully accepted to use the big data mining technology [6]. As hackers' attacks are frequent nowadays, how to make sure all the private information is safe is another huge challenge. However, this bias will not limit the development of big data mining technology a lot. As the development of high-powered chips and more researches in the field of big data mining, it will be more accurate and timelier and being applied in more field of banking.

7 Conclusion

To sum up, the study focuses on the applying of big data mining technology in bank three areas. Firstly, the big data mining will help banks to be able to collect and analyze a huge amount of information to improve their management efficiency. Secondly, the technology can aid human managers to design better plans of services and investment. In the last, the essay discuss how big data will help to control the risks of banks. Though the big data technology is be blamed to invade privacy in some way, the attribution it made to the development of banks and the whole economic systems are more important. The development of big data mining may substitute most of human employees whether consultant and analyzers even senior managers. This essay concludes most popular and important usage of big data in bank field for bankers and other researches to get afflatus in future development.

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