



Original Article

Machine Learning- A Modern Technology in Banking

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Abstract

Banking sector is one of the crucial sectors which drives the global economy. Banks deal with huge volume of money on a daily basis, and this value is increasing continuously. Therefore, it is evident that banks are adopting the latest technologies in order to deal with this problem in an efficient manner. The latest member of this list of technologies is Machine Learning, which is revolutionizing the way data analysis and business intelligence operates. Machine Learning is able to predict future patterns; thus, it has great scope in banking sector. On the other hand, there is an abundance of data generated in bank transactions which is necessary for implementing Machine Learning. This paper takes a look at the various ways in which Machine Learning can have a profound impact on Machine Learning.

Keywords: Banking, Machine Learning, Fraud detection, Credit score, Security

Introduction

Banks are a vital part of the global economy. Essentially, banks are institutions that manage the financial assets of the customers, both individual and corporate; provides credit in exchange of additional interest and makes it possible to transfer money any place in the world. Banks are crucial to the financial stability of a country; therefore, banking is highly regulated. The concept of banking exists for thousands of years. Ancient Greeks, Chinese, Babylonian and Indian civilizations had institutions similar to banks for accepting deposits and giving loans. Today, banks are massive organizations catering to billions of people worldwide. A huge bulk of bank transactions take place on a daily basis, typically at the rate of millions of transactions per second. It is estimated more than \$14 trillion flows daily through the banking system in USA alone [1]. Banks must handle these transactions quickly while also keeping security concern in mind. It has been observed that the banking sector is foremost in adapting new technology, which can help in speeding up the process. For instance, banks were some of the earliest users of mainframe computers, investing from the late 1950s. Optical character recognition, relational databases, digital payment systems, cryptography, and more recently, blockchain are some of ground-breaking technologies that have been adapted by banking systems. In India, the amount of money transacted through electronic payment systems daily is around ₹4 trillion, or around \$53 billion [2].

Thus, banking sector and technology go hand in hand for providing better facilities to users. Machine Learning is a cutting-edge technology which has many applications in various sectors of the industry, including computation, manufacturing, business, retail and much more. Basically, machine learning is an application of artificial intelligence in which systems have the ability to automatically learn from experience and apply this acquired learning. Perhaps the most extraordinary feature of machine learning is that there is no need of explicit programming for learning new information. The process of learning begins with data, such as examples, direct experience, or instruction. Machine learning algorithms attempt to look for patterns in data and make improved decisions in the future. Machine learning is closely related to statistical mathematics, as these algorithms create a mathematical model for better results. The various ways in which artificial intelligence can be useful, has been documented since the 1960s. In those days, the inadequate computation power limited the scope of machine learning techniques. However, with more powerful and advanced devices, these algorithms and techniques can be widely used. Thus, machine learning has the potential to pave the way for unique applications that will improve the existing software. The combination of machine learning technology with banking sector has the capacity to rapidly evolve the currently used technology to bring about a remarkable financial impact.

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Machine learning can be used in many ways within banking sector- to predict the loan status of a customer, to predict the scope of credit card business, to forecast whether the telemarketing strategy will work or not, fraud detection, biometric authentication for security, knowledge discovery for banking risk management and so on. On the other hand, banking sector holds a lot of promise for progress of machine learning techniques. Deploying machine learning algorithms is a capital- intensive task, as high-end devices and professionals with specialized knowledge are required; banking sector has no scarcity of capital. Perhaps of greater importance is the availability of abundant data. Thus, the coalition of machine learning and banking is inevitable.

Objectives

The primary objective of this paper is to understand the use of machine learning technology in banking sector. The following domains have been discussed in this study:

1. Fraud detection
2. Predicting credit score of the customer
3. Face recognition for security

Discussion:

Fraud detection:

'Fraud' can be defined as an illegal activity to obtain money, assets or other property owned by posing as a fake entity. There is a difference between fraud and theft, since fraud takes place in a sophisticated manner with an elaborate scheme. Various types of fraud happen in banks, such as accounting fraud, forged documents, loan application fraud, money laundering, identity theft, Internet fraud and so on. Bank fraud cause massive damages. According to a report, Indian banks have lost ₹70000 crore due to frauds in the last 3 financial years. Since there are numerous ways in which fraud can occur, detecting fraud is quite complicated. Most of the times, fraud is not recognized until it is too late. However, using Machine Learning algorithms, bank transactions can be analyzed to identify the fraudulent activity beforehand.

Money laundering is the act of making illegally obtained funds into legal money. This is done by making multiple complex transactions in order to hide the trail of the money. For this purpose, various 'shell companies' are created by the money laundering agents, which are basically dummy organizations. Using machine learning techniques on the bank transaction data, it is possible to detect whether the organization performing them are shell companies [3]. Thus, machine learning can be utilized to prevent fraud at an early stage itself and avoid unnecessary financial losses.

Predicting credit score of the customer:

The credit score of a customer indicates his/her credit worthiness. Essentially, it allows banks to evaluate the potential risk faced by lending money to the customer. It also gives them an idea which customers will bring in the most revenue. Calculating the credit score involves use of data analytics of various factors such as credit history, defaults on bills etc.

Nowadays, new mathematical models based on machine learning algorithms are being used to calculate credit score of customers [4]. The most important advantage offered by these techniques is flexibility, since the model is not based on fixed mathematical equations. Rather, the model adjusts itself according to the situation and nature of data. Machine learning can also be used for various purposes such as predicting when customers will visit the bank, predicting whether the telemarketing strategy used will be successful in convincing a particular consumer, and customer retention based on user data.

Face recognition for security

Security is one of the most critical aspects in banking organizations. Since banks handle huge amount of money, in the order of billions of dollars, high priority is given to ensuring strict security protocols. This includes proper authentication and authorization of customers. An effective authentication system should protect customers' data, prevent money laundering, reduce fraud, prevent identity theft and ensure appropriate safety for online transactions. Thus, banks are increasingly investing in more improved methods to accurately identify the customers. *Biometric authentication is emerging as a solution of automated customer recognition. This includes various methods such as fingerprint recognition, face recognition, retina-based identification and so on. Convolutional Neural Network, a form of Machine Learning technology, is used for enabling devices to perform face recognition [5]. The amount of data available in this regard is enormous, since people click pictures of themselves, commonly known as 'selfies', on a regular basis. This, combined with the official ID photos of the persons, can be used to train the devices to a high degree of precision. Thus, biometric authentication via face recognition can be expected to be widely used in the near future.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Conclusion

Machine learning is a powerful technology that has a wide variety of applications. Thus, many of the world's topmost institutions are investing heavily into machine learning technologies. The banking sector, too, can benefit by adapting this technology to

improve efficiency, analytics and security. In the near future, machine learning will be an indispensable component of technology in banking sector.

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