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Use of Big Data in Financial Sector

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Abstract

The world's largest banking as well as financial institutions produce and conduct massive amounts of financial transactions every minute. So, this business is data-intensive by default of its very nature. Big Data, previously defined as "a collection of knowledge with huge, diversified, and complicated that is developing at an increasing rate," is applicable to the complex data existing in this industry. These data provide the bank with a greater opportunity to comprehend the clients, product presentation, market trends etc in the cutthroat market place.

Due to recent technology advancements, about fifty per cent of the adult population now uses digital banking. Customers now find it simple to complete various tasks, contact many organisations, research offerings and services, buy new items, give feedback, and carry out banking tasks thanks to the rapidly increasing number of iPad, mobile phones, and other electrical gadgets. These actions and the resulting data can be used to build a buyer persona, which is something the bank can then analyze to track trends, anticipate consumer behaviour, and provide tailored services.

This article discusses a few of the current applications of big information in finance and some potential prospects and underlying problems that must be overcome.

Keywords: Banking and Financial Institutions; big data; technological advancements; consumer behaviour

I. Introduction

Digital data has increased with the use of the web, smartphones, as well as other apps. Both commercial companies and government agencies are aware of the enormous potential of harnessing this information, often known as Big Data, to produce long-term productivity gains and actual value for customers. Businesses and economies may be transformed by big data, but

data science is the true game-changer.

In order to find underlying patterns, the customer wants and trends, undiscovered relationships, the customer wishes, and other useful knowledge that aids in achieving key marketing goals, analytics of the big data is the analysis of large and diverse data sets. About 11 billion gadgets—a startling increase in both amount of information production technologies and the sensors found in every device—are responsible.

Demonetization ushered in a new age that hastened India's e-commerce and financial sector's rapid expansion. With demonetization, the Indian government started promoting digitalization in order to create a society without cash, paving the way for a surge in e-banking and e-commerce operations. BHIM UPI, ICICI Pockets, etc. are just a few examples of the few mobile payment apps available. The expansion of Paytm, a mobile-only e-commerce website launched in 2010, which attracted financial stake from businessman Ratan Tata by March 2015, provides a clear indication of the potential of the company.

China's Alibaba invested $600 million in the business during the same period. With over 165 million purses and 75 million Android apps downloaded as of Dec 2016, PayTM has grown to become India's biggest mobile payment provider.

II. Review of Literature

Due to its importance to the economy, this financial sector is a topic of interest for researchers in a variety of disciplines, namely management, advertising, accounting and finance, and computer technology (Zu et al, 2013).

Berger discovered in 2003 evidence of a link between technological advancement and efficiency of banking. The authors jointly underline that banking organizations utilize applied the models of mathematics for complementing their financial understanding for a variety of tasks, including risk assessment and reputation evaluation (Dean, J. and Ghemawat, S, 2008).

Big data can be defined as data-sets that are large enough to be collected, stored, handled, and evaluated utilizing conventional system resources in the article "Market share in Education and Training Insights. EDUCAUSI Journal, 46(5), 30 32" (2011) (Castiglione et al, 2014).

The study "Digitalization as well as Big Data Gathering in Banking" concluded that the introduction of cloud computing would significantly increase the computation time of current

frameworks, whereas the growth of the IOT enhances techniques of big data and may have a good effect on cognitive computing and the development of flexible, real-time systems (Renu, R.S., Mocko, G. and Koneru, A. (2013).

III. Big Data-Concept

Big Data is a gathering of large data-sets which is so vast and complicated that it is hard to manage it with conventional data processing software or one-handed information management solutions.

Due to the small amount of information and the short processing time, data processing was usually done on servers. But, in the modern technological environment, information is generated so quickly that individuals are frequently dependent on it. The speed at which the data is rising makes it tough to amass it on any server. One more interesting fact is that data warehousing has historically been employed to store a lot of data and run sophisticated analytics.

Yet, the data centre only uses a tiny amount of data, which results in incorrect data.

You might obtain the similar result if you alter the model.

It required a long turnaround time to obtain significant results. Large amounts of data cannot be processed and stored in data centres quickly. They aid in the growth of big data analytics. Collecting, storing, finding, sharing, transmitting, analysing, and visualising these data are all part of the big data issue.

Here are some examples of big data.

Data types include

- structured,
- unorganized, and
- semi-structured information.

Organized Data

Structured information refers to information that can be kept, retrieved, and processed in a set format. While time has gone on, computer science talent has grown more engaged in creating methods for utilising and extracting value from this information.

But, when the quantity of these data increases on a fast pace and standard size reach zettabytes, we are already anticipating issues.

The Non – normalized data

Unorganized data is any data that has an undetermined form or organization. Unsupervised learning is large in extent and nearbya number of processing hurdles in order to extract worth from that too. Unstructured data is frequently found in diverse sources of information that combine simple text files with photos, movies, and other types of media.

Companies now possess a wealth of data, however, regrettably they are unable to make sense of it since it is in an unorganized or raw form.

Somewhat Structured Data

Both sorts of data may be present in semi-structured data. Although quasi-data can be viewed as structured in form, database Systems do not have a clear definition for it, such as a table specification. One type of data in an XML file is quasi-data.

Features of the Big Data

The four defining qualities of big data are as follows:

Quantity

Diversity,

Speed,

Veracity

Quantity

Big Data refers to a scale that is enormous in itself. Evaluating the value of the results depends heavily on sample size. How or whether a given set of data may be categorised as Big Data also relies on its volume. Another characteristic that must be considered is "Size."

Diversity includes various sources, both organised and unstructured, as well as the type of data. The only data sources that most programmes looked at recently were spreadsheet and datasets. Applications for analysis are also taking into account information like emails, pics, reels, controlling devices, documents etc. There are various storage space, processing, and data analytics issues brought on by the quantity of unstructured information.

Velocity

This rate during which data is generated is called "velocity." The full possible data depends on how much rapidly it is produced and handled to satisfy the expectations.

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Huge Data The topic of velocity refers to the speed at which the data is generated from various resources, including corporate processes, software logs, networks, social media platforms, sensing, portable devices, etc.

Veracity

It refers to the incomprehensibility that data frequently displays, impeding one's ability to efficiently handle and organize it.

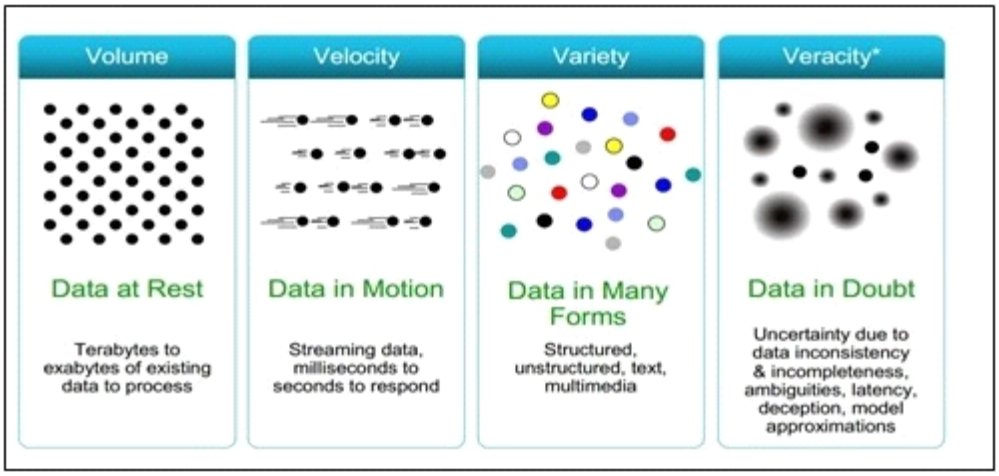

Fig 1: Features of Big Data

IV. The Indian banking industry

With independence, Today's banking sector has likewise experienced incredible growth. The administration had to nationalise the majority of banks in the 1960s and 1970s due to a string of financial scandals and incompetence.

However after 1991, the private bank had a significant resurgence as a result of liberalisation, globalisation, and privatisation. There really are presently 28 PSU banks, 22 pvt sec banks, and 43 international banks authorised to undertake banking in India, according to data published by the Reserve Bank of India (RBI). Further two organisations, IDFC (Infrastructure Development and Finance Company), and Bandhan, a former microloan company, have obtained banking licences. Moreover, there are almost 90,000 cooperation banks and 61 national rural banks. The banking industry in India is approximately 81 trillion rupees ($1.31 trillion).

KPMG and CII analysis indicates that India's banking sector would grow to be the third biggest worldwide by 2025 and the fifth in the world by 2020.

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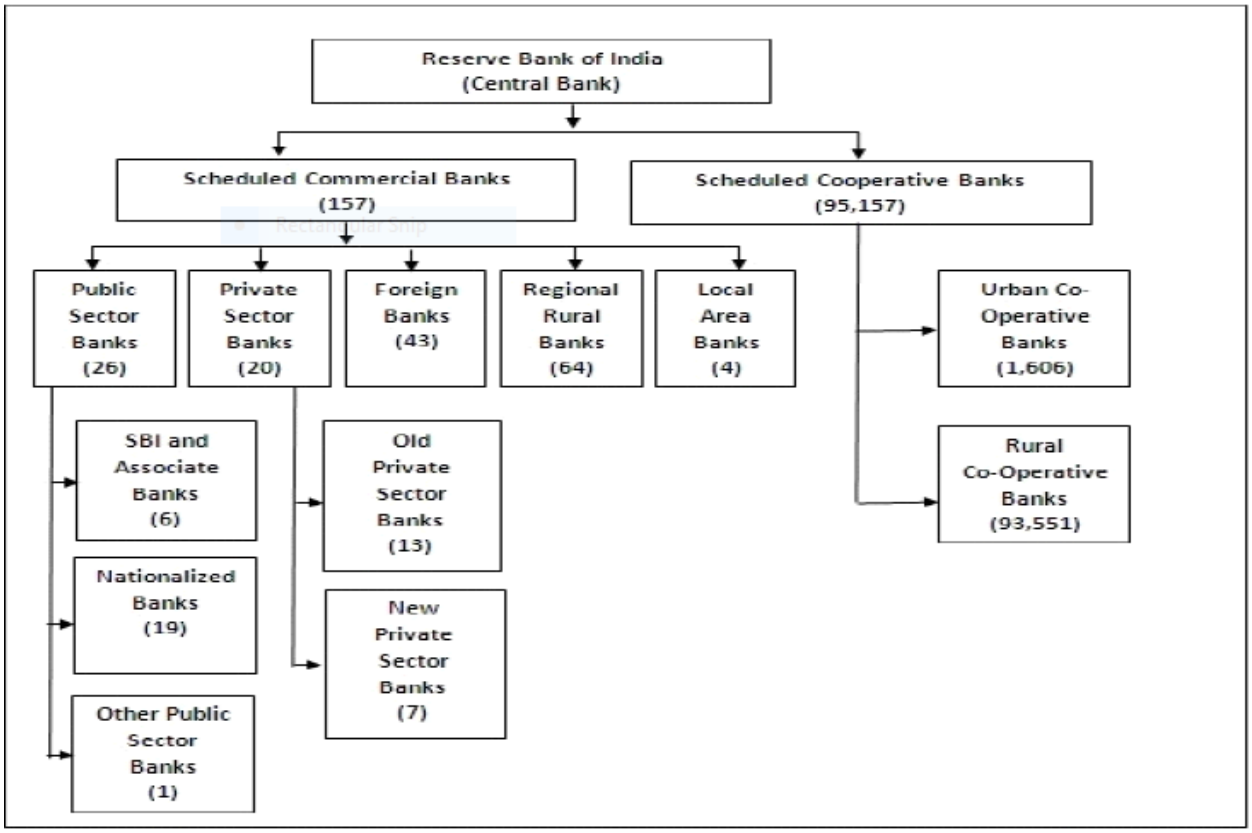

Figure 2 Banking structure in India

The new millennium has also seen an increase in creative banking methods. The technology revolution that made computers and mobile phones commonplace and brought the Internet to more people has also been used by banks.

Technology has assisted banks reduce their reliance on branch locations and reach out to a wider customer base by employing online banking services, starting with internet banking, phone money, and remote banking.

V. The Age Of Big Data

BIG DATA= Transactions + Interactions + Observation is a formula for defining big data.

Big data is defined by Gartner as data resources with large quantity, speed, and diversity that call for innovative, cost-effective techniques of data processing to recover insight and judgement.

Each day, 2.5 quadrillion bytes of information are created.

Data volume has gone from gigabytes to petabytes to exabytes, to today's zettabytes.

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According to IBM, social networking posts, digital photographs and videos, transaction process records, GPS transmissions from mobile phones, or devices used to collect climatic data are just a few examples of the sources of history's unstructured data. All of such unstructured data make up big information. Big Data is a collection of numerous, complicated large datasets that are challenging to manage utilizing existing data management software or standard data processing software.

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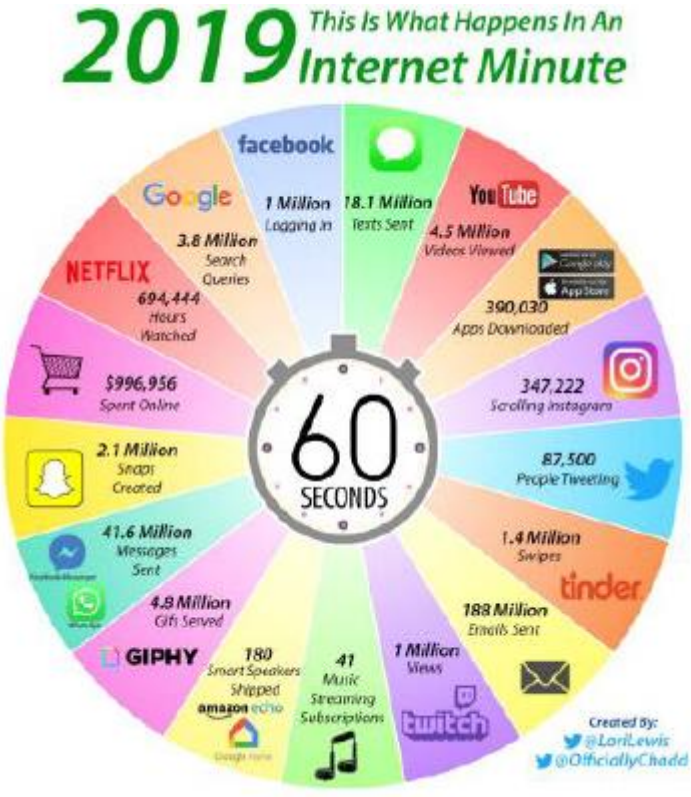

Creation of large data

- Social Networking sites and Media
- Scientific equipment, laptops, and mobile devices
- Sensor Networks and Technologies

Banking transaction analysis employing big data analytics has enormous financial benefits. The amount of effective case studies is growing, supporting broader research that suggests businesses may increase sales efficiency and profits by deeply integrating analytics and data collection into their banking operations.

Companies adopt this model relatively quickly because to the new strategy of data-driven sales, greater understanding of client preferences, more accurate projections, and faster judgement times.

VI. Applications Of The Big Data In Banking And Finance Sector

Following are the instances where big data is being used in banking:

Risk Management,

Fraud Prevention,

Customer Satisfaction,

Optimisation,

Customer Feedback,

and Recognizing When a Client Is About to Depart

Risk management utilising sentiment analytics

For banking firms to avoid suffering significant revenue losses, establishing an extensive risk management strategy is crucial. In order to survive in a world that is fiercely competitive and maximise their profit, organisations must constantly come up with new ideas. Big Data Analysis aids companies in spotting danger in real time, thereby protecting customers from potential fraud (Lee et al, 2013).

Detecting fraud

The rapidly expanding digital world offers us numerous advantages but also gives rise to different types of frauds.

The biggest challenge a financial institution faces is the personal data's increased vulnerability to

cyberattacks. Businesses may now spot fraud before it is reported utilizing Big Data Analysis and specific machine learning algorithms. It is accomplished by identifying frequent patterns in user spending, foreseeing unusual user behaviours, etc.

Consumer satisfaction

One of the most difficult responsibilities for banking companies is to guarantee customer happiness because of the significant level of risk involved. The banking industry takes a lifelong approach to customer loyalty, from making sure their activities are secure to giving them the best and most advantageous offers. The information they get from their customers is more crucial than ever (Ribarsky, W., Wang, D.X. and Dou, W. ,2014).

Process optimisation in the workplace

Whenever big data and machine learning are used together, banks can examine their internal procedures and take action to improve them. They can drastically cut operating expenses in this way.

Analyze customer reviews Text-based information about customers' sentiments can be found on many social media websites. After these feelings are documented, they can be classified as positive or negative and used to deliver services to customers by using various filters. Identify clients who are going to leave. As we all know, it costs more to get new clients than it does to keep the ones you already have. If the bank meets the needs of the customer by being aware of the problem, care should be taken to find a solution (Hipgrave, S. ,2013).

Analytics of Sentiment

Banks must continually monitor what consumers have to say for marketing objectives. In order to enhance efficiency and quality, banks must identify who the key customers are and close any gaps in service.

VII. Big Data And Banking Sector In The Future

A lot of applications are there for big data in the finance sector. But all these endeavours seldom went beyond the surface.

The full potential of big data must also be utilised in the financial industry.

Big data, in the opinion of 62% of banks, is essential to their performance, based on a whitepaper by Global Transaction Banking.

Nonetheless, only 29% of them claim that their results had enough business value.

Banks must reevaluate their processes and implement data-driven strategies if they hope to remain relevant and competitive.

Big data will also assist you in growing and diversifying your banking-related business.

VIII. Conclusion

We are living in the world of Big Data, artificial intelligence and robotics. Companies must comprehend Big Data's characteristics and practical applications. For businesses to ignore them, the benefits and drawbacks are too great.

Far more data would be available if other data sets like corporate, data in public and social domains were combined. Many banks and other financial institutions are starting to use social media websites and other marketing research platforms to gather customer-related data for sentiment analysis. Big Data will have a major effect on society, but it is unclear whether society will respond to Big Data.

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