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Rise Of Big Data

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Abstract: *Information systems coupled with internet, cloud computing, mobile devices and Internet of Things have led to massive volumes of data, commonly referred as big data. It includes mix of structured, semi-structured and unstructured real-time data, constituting of data warehouse, OLAP, ETL and information. Business firms and academicians have designed unique ways of tapping value from big data. There is a great scope of using large datasets as an additional input for making decisions. The aim of the paper is to explore the role of big data in these areas for making better decisions. Here we explore how big data can be used to make smart and real-time decisions for improving business results. The paper undergoes literature review and secondary data to provide a conceptual overview of potential opportunities of big data in decision making. The paper discusses the concept of big data, its role in decision making and also the competitive advantage of big data for different firms. The paper also discusses a framework for managing data in decision making. The topic must be addressed for taking better decisions for firms which will contribute to high quality knowledge.*

Key Word: *big data, big data analytics, social media analytics, marketing analytics.*

I.INTRODUCTION

Information systems have evolved over the years from being transactions recording system to supporting business decisions at different levels. Traditional information systems depended primarily on internal data sources such as enterprise resource planning systems (ERPs) for making business decisions. These datasets were structured and used relational database management system (RDBMS). These were used for supporting internal business decisions such as inventory management, pricing decisions, finding out most valuable customers, identifying loss making products etc. Besides, data warehouse was built using this data for analysis and mining purpose. These data sources were integrated with data from business partners such as suppliers and customers using enterprise application integration (EAI) platforms. EAI enabled seamless integration of information systems between business partners. It enhanced speed of business to business transactions (B2B), communication and reduced cost of inter-company transactions. In the next wave in early nineties, arrival of internet further simplified integration of firms with their business partners. In the last decade, information systems coupled with internet, cloud computing, mobile devices and Internet of Things have led to massive volumes of data, commonly referred as big data. It includes structured, semistructured and unstructured real-time data, constituting of data warehouse, OLAP, ETL and information. Computer science has advanced to store and process large volumes of diverse datasets using statistical techniques. Business firms and academicians have designed unique ways of tapping value from big data. The objective of this paper is to explore the role of big data in making better decisions and how big data can be used to make smart and real-time decisions for improving business results.

II. WHAT IS EXACTLY BIG DATA?

The definition of big data is data that contains greater variety, arriving in increasing volumes and with more velocity. This is also known as the three Vs.

Put simply, big data is larger, more complex data sets, especially from new data sources. These data sets are so voluminous that traditional data processing software just can't manage them. But these massive volumes of data can be used to address business problems you wouldn't have been able to tackle before.

III.THE THREE VS OF BIG DATA

Volume - The amount of data matters. With big data, you'll have to process high volumes of low-density, unstructured data. This can be data of unknown value, such as Twitter data feeds, clickstreams on a web page or a mobile app, or sensor-enabled equipment. For some organizations, this might be tens of terabytes of data. For others, it may be hundreds of petabytes.

Velocity - Velocity is the fast rate at which data is received and (perhaps) acted on. Normally, the highest velocity of data streams directly into memory versus being written to disk. Some internet-enabled smart products operate in real time or near real time and will require real-time evaluation and action.

Variety - Variety refers to the many types Variety refers to the many types of data that are available. Traditional data types were structured and fit neatly in a relational database. With the rise of big data, data comes in new unstructured data types. Unstructured and semi structured data types, such as text, audio, and video, require additional preprocessing to derive meaning and support metadata

IV.THE VALUE-AND TRUTH-OF BIG DATA

Two more Vs have emerged over the past few years: value and veracity. Data has intrinsic value. But it's of no use until that value is discovered. Equally important: How truthful is your data—and how much can you rely on it?

Today, big data has become capital. Think of some of the world's biggest tech companies. A large part of the value they offer comes from their data, which they're constantly analyzing to produce more efficiency and develop new products.

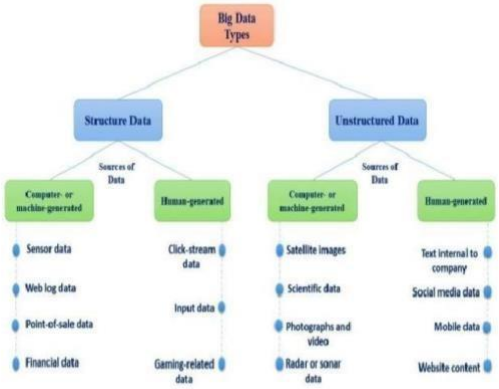
Recent technological breakthroughs have exponentially reduced the cost of data storage and compute, making it easier and less expensive to store more data than ever before. With an increased volume of big data now cheaper and more accessible, you can make more accurate and precise business decisions.

Finding value in big data isn't only about analyzing it (which is a whole other benefit). It's an entire discovery process that requires insightful analysts, business users, and executives who ask the right questions, recognize patterns, make informed assumptions, and predict behavior.

But how did we get here?

V.BIG DATA TYPES

Big Data encompasses everything, from dollar transactions to tweets to images to audio. Therefore, taking advantage of Big Data requires that all this information to be integrated for analysis and data management. This is more difficult than it appears. There are two main types of data concerned here: structured and unstructured. Structured data is like a data warehouse, in which data is tagged and sortable, while unstructured data is random and difficult to analyze. The Figure below depicts these types, along with examples:



Big data types

VI.TOOLS

Big Data Tools are used to extract information from a vast number of data sets and process them. The value of Big Data isn't only determined by the amount of data available. Its worth is determined by how you use it. The Big Data ecosystem is evolving at a breakneck speed. Multiple functions within the business are now supported by a broad range of analytic approaches.

- Users can leverage Descriptive Analytics to figure out "what happened and why." Traditional query and reporting settings with scorecards and dashboards are examples of this type of Analytics.
- Users can use Predictive Analytics to assess the probability of a specific occurrence in the feature. Early warning systems, fraud detection, preventative maintenance applications, and forecasting are just a few examples.
- Prescriptive Analytics gives the user precise (prescriptive) recommendations. They respond to the query, "What should I do if "x" occurs?"
- You can easily complete business-related activities when you integrate Big Data with high-performance Analytics. In traditional databases, processing a vast volume of data can be quite challenging.

As a result, you can easily use Big Data Tools to manage your data. Big Data Analytics can help you make better and quicker decisions, model and forecast future events, and improve your Business Intelligence.

VII.HISTORY OF BIG DATA

Although the concept of big data itself is relatively new, the origins of large data sets go back to the 1960s and '70s when the world of data was just getting started with the first data centers and the development of the relational database. Around 2005, people began to realize just how much data users generated through Face book, YouTube, and other online services. Hadoop (an open-source framework created specifically to store and analyze big data sets) was developed that same year. NoSQL also began to gain popularity during this time. The development of open-source frameworks, such as Hadoop (and more recently, Spark) was essential for the growth of big data because they make big data easier to work with and cheaper to store. In the years since then, the volume of big data has skyrocketed. Users are still generating huge amounts of data—but it's not just humans who are doing it

With the advent of the Internet of Things (IoT), more objects and devices are connected to the internet, gathering data on customer usage patterns and product performance. The emergence of machine learning has produced still more data. While big data has come far, its usefulness is only just beginning. Cloud computing has expanded big data possibilities even further. The cloud offers truly elastic scalability, where developers can simply spin up ad hoc clusters to test a subset of data. And graph databases are becoming increasingly important as well, with their ability to display massive amounts of data in a way that makes analytics fast and comprehensive.

VIII.CONCLUSION

We have come a long way since information revolution has changed the way business firms work. Big data is helping firms to get competitive advantage using different analytics techniques. These techniques help us to get insights, patterns, correlations and associations which could not be understood through traditional small data. These support decisions making process for business executives with the help of social media data, competitive intelligence, cost and time reduction strategies, supply chain analytics, web analytics etc. Firms which recognize significance of big data and developing products around data have received huge dividends in recent years. Many firms use analytics in almost all aspects of conducting their business to reap the benefits of analytics based decision making. In this paper, we present a conceptual framework for developing analytics capabilities and how this emerging knowledge can be help small and medium firms to compete using lesser resources. It can be adopted by such companies with changes in line with their business domain and model. This framework can be a starting point for further analysis, enhancement and future research opportunities. With continued digitization of every aspect of society as well as business, pace of generation of high speed high volume data is going to continue. This provides a sound opportunity to exploit the field of analytics for decision making.

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