



Big Data: An Innovative way to Gain Competitive Advantage Through Converting Data into Knowledge

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Abstract: “Big Data” has emerged as the new wave in the global market place. Big Data refers to the datasets whose storage capacity is beyond the ability of traditional database software tools for capturing, storing, managing, and analyzing the unstructured data. Big Data has become revolutionary technologies that help in enhancing organization’s bottom line through converting data into knowledge. Early movers across the sector has started using Big Data for analyzing consume behavior, predicting future business, enhancing customer loyalty, and gaining competitive advantage among their peers. Thus, this paper aims to present concept of Big Data, illustrate competitive advantage derived from using Big Data with the help of cases, and outlining barriers that are faced during implementation of Big Data. Big Data is still in its evolutionary phase, so this paper will help scholar, academicians, entrepreneurs and others to gain insight about the concept.

Keywords: Big Data, Concept, Opportunities, Cases, Barriers.

I. INTRODUCTION

With the advancement in the information technology field, more and more organizations, individuals, as well as government organizations are sharing and storing their data digitally. This increased use of technology has led to emergence of vast amount of data flowing across global economy^[1]. According to a survey conducted by McKinsey (2013), the world is expected to come across 5 zettabytes of new digitized data in the year 2014 and 35 zettabytes of data till 2020. Thus, these unstructured data must be intelligently analyzed in order to gain competitive advantage. This can be done through the new phenomenon budding up – “Big Data”. Big data has emerged as the new wave in the global market place. It has become revolutionary technologies that help in enhancing organization’s bottom line through converting data into knowledge. Early movers across the sector has started using Big Data for analyzing consume behavior, predicting future business, enhancing customer loyalty, and gaining competitive advantage among their peers.

II. BIG DATA: CONCEPT

Earlier storing of large amount of data was not feasible for the companies as it require huge investment on storage. With the advent of cloud computing and other open-source technologies, storing this vast amount of data became possible as well as profitable. This vast pool of unstructured data has been originated from cell phones, laptops, smart phones, social networking sites, and others. Business leaders and analysts are churning these unstructured data for gaining insights about present and future trend of the business, or predicting consumer behavior, and others.

Big Data refers to the datasets whose storage capacity is beyond the ability of traditional database software tools for capturing, storing, managing, and analyzing the unstructured data. Big Data is characterized by basic elements as huge data (Volume), fast Moving (Velocity), multi-structured (Variety), and Value. Srirangpatna, Dialani, Muscolino (2014) defines big data as a new generation discovery in the branch of information

technology and architecture and that generates economic value from diversified base of unstructured data through extracting, apprehending, discovering, and analyzing it^[2]. This includes the hardware as well as software for integrating, organizing, managing, analyzing, and presenting data, which is having four V’s (Volume, Variety, Veracity, and Velocity) as its attribute. Big data also refers to expectation from big data in terms of MAD that means Magnetism (means ability to attract diverse data irrespective of structure or schema), Agility (ability to synchronize with continuous evolution of data), and Depth (a deep system that supports data analysis)^[3].

III. ORGANIZATION CAPITALIZING BENEFITS FROM BIG DATA

Vast pool of digitized data are generated in form of supply chain related data, sales figures, customer data, performance related data, data related to bank transactions, data posted on social media, and others. Companies are realizing the strength of this pool of data through transforming these raw data into knowledge. Many companies across the world have started capitalizing the benefits derived from Big Data. Some of the examples of companies’ implementing Big Data are:

- **Walt Disney:** Walt Disney is utilizing the benefits of Big Data by collecting information related to business operations, transactions, and customers from social media, web repositories (including their own home page), from sites of ABC and ESPN, and others. Further, Disney used Hadoop and MapReduce for the purpose of data mining that was not possible earlier. This has enhanced experience of various stakeholders of the company, like: internal groups, customers, and business partners. Implementation of this new technology has helped company to lower their cost as well as time that was required in traditional business intelligence (BI) system^[4]. Disney theme park has introduced band with RIFD chips for its guests. This chip will collect information related to preferences of the customers, personal information, and consumer behavior. Thus will help the company to enhance their customer experience through training their employees,

like explain expected behavior from them and that is in-line with customer preferences.

- **Makemytrip.com** – make my trip is using big data to enhance their customer experiences through offering personalized service. Personalization plays significant role in travel or leisure business as customers wants to have personalized as well as authentic experience. Big data helped them to gain competitive advantage through enhancing their decision-making process, enhanced product as well as service innovation, and building strong relationship with customers^[5].
- **Zillow** – the company has capitalized the benefits of big by gaining scalability in their business. Data helped them to think out of the box and also help them to take more strategic decisions^[6].
- **General Electric Co. (GE)** – GE has committed \$1 billion for the purpose of data analytics and software over 4 years. GE is has capitalize the Big Data benefits in terms of “industrial internet”. This “industrial internet” states that the company will store torrent of data, which is be gathered through sensors that is embedded in the GE’s turbines, jet engines, trains, and MRI equipment’s. Analyzing these data will help the company as well as customer in identifying and solving issues before they occur. Further, it will help company in enhancing their operation, improving their fuel efficiency, making data useful to the customer through real time analysis, optimization of machine, and taking intelligent decisions^[7]. This helps the company in improving its efficiency, reducing cost, and enhanced bottom line.
- **IBM** – IBM has used Big Data for exponentially improving its Constant-Contract-Performance. This has led to enhanced performance by 15 to 25% of their e-mail campaigns that are related to effective implementation of their email strategy for their customers.
- **UPS** - the company uses big data for tracking data of their 8.8 million customers every day. This requires company to store 16 petabytes of data daily. The company gathers their “big data” through telematics sensors that are embedded in their 46000 vehicles. Analyzing these data helps the company to effectively monitor route structure, optimization of performance, gaining fuel efficiency, and others.

IV. BIG DATA: OPPORTUNITIES

Successful implementation of big data will foster following opportunities to the individuals as well as organizations:

- Helps in retaining customer through analyzing data generated from help desk, traffic patterns, social media, customer reviews, and others. This will help the company to predict prospective customer’s issues and ensure that the problem does not arise in future. Thus, taking this proactive step will ensure retaining customers as well as attracting prospective customers.
- Enhanced operational efficiency is gained through predicting consumer behavior, prospective demand for product or service, and future inventory requirement based on predicted demand. Successful implementation of big data will also help in prevention of fraud and identification of risk^[8].
- Help companies to lower their cost as well as time that were required in traditional business intelligence (BI) system^[4].

- Big data offers storing of huge data at lower price^[9].
- Helps in making quick and strategic decisions, and at the same time effectively respond to the client queries as well as complaints.
- Enhanced customer experiences through offering personalize products or services as per customers’ demand, and using tailor made advertisements. Further, big data foster real-time efficiency through offering information related to product offerings, availability, and others.
- Helps in gaining enhanced financial incentives – more than sixty percent increase was seen in net margin of U.S. retail. Further, annual productive growth rate was reported to be between 0.5 to 1 percent. Manufacturing sector enjoyed decreased working capital by 7 percent.

V. BIG DATA: BARRIERS

Big Data is still in its embryological phase and this is the reason why it presents numerous challenges in its successful implementation. Some of the major barriers while capitalizing benefits of Big Data are:

- **Technological hurdles** – comparing or analyzing of unstructured data with structured data is a crucial challenge for the organizations. Further, lack of suitable in-house software act as hurdle. In addition to this, successful implementation of Big Data requires organizational change, including transformation in the legacy system. This may give rise to organizational conflicts.
- **Validity of data** – this is the challenge related to continuous need for filtering large datasets, for the purpose of getting relevant data for analysis.
- **Talent crunch** – lack of technical skills in the existing human capital of the organization. There is terrific shortage of data analytics to support successful implementation of Big Data^[10]. Lack of suitable talent with machine learning; knowledge of mathematical expertise and quantitative analysis will act as barrier in the successful implementation of Big Data.
- **Resistance towards sharing data** – there is crucial issue of privacy violation with sharing of one’s data. There is continuous threat of losing data due to misuse of data, hacking of confidential credentials, privacy invasion, risk of data security, and others^[11].

VI. DISCUSSION

Barriers or hurdles in the successful implementation of Big Data technology can be eliminated or reduced through following ways:

- **Developing organization culture** – organization culture should be developed so as to support effective implementation of big data. This requires developing of organization culture that fosters transparent communication system; motivate employees to adopt new technologies without fear, fostering innovation, and others.
- **Resolving technological barriers** – analyzing big data requires implementation of various advance execution technologies, data analyzing as well as visualization tools and others. In addition to this, hardware’s are required to be purchased or upgraded as per organization’s IT (information

technology) department current capability as well as future requirement. Thus, these infrastructural techniques should be made available within the organization that is leveraging big data technologies. Further, technological hurdle that is related to comparing unstructured data with structured one can be removed through operational technologies, like: NoSQL, Hadoop, PIG, Hive, and others.

- **Resolving issues of skill gap** – human capital can be trained to perform better data analysis job and overcoming shortage of talent crunch. This requires strong top management commitment as well as designing the organization culture where people are passionate towards exploring data as well as converting them into knowledge.
- **Developing confidence among the big data users** - encryption can be used for building trust among the users who resist sharing data ^[12].

VII. CONCLUSION

Thus, telecom, banking, retail, e-commerce, travel, and insurance are the sectors that can capitalize from implementing big data. This will help them to gain sustainable competitive advantage across global market through enhancing their product as well as service, increasing market share, better customer experience, building strong customer relationship, and increasing its triple bottom line.

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