Applied Science and Engineering Journal for Advanced Research *Peer Reviewed and Refereed Journal*
ISSN (Online): 2583-2468
Volume-2 Issue-5 || September 2023 || PP. 60-65 DOI: 10.54741/asejar.2.5.10

A Study of Big Data: An Importance to Create New Trend in E-Business

Dr. Mahendra Singh Bora[1] and Bhupendra Singh Latwal[2]
[1]*Assistant Professor, Department of Computer Science, Shriram Institute of Management & Technology, Kashipur, India*
[2]*Assistant Professor, Department of Computer Science, Shriram Institute of Management & Technology, Kashipur, India*

[1]*Corresponding Author: mahendra.singh.bora@gmail.com*

Received: 01-09-2023	Revised: 14-09-2023	Accepted: 30-09-2023

ABSTRACT
In the developing world it is require providing services in the financial, agricultural, business, government, healthcare, information technology and e-business sectors. The increasing volume and detail of information captured by enterprises, the rise of multimedia, social media, and the Internet of Things will fuel exponential growth in data for the foreseeable future. Big data is not a precise term; rather it's a characterization of the never-ending accumulation of all kinds of data, most of it unstructured. It describes data sets that are growing exponentially and that are too large, too raw or too unstructured for analysis using relational database techniques. Whether terabytes or petabytes, the precise amount is less the issue than where the data ends up and how it is used. Big Data concern large-volume, complex, growing data sets with multiple, autonomous sources. With the fast development of networking, data storage, and the data collection capacity, Big Data are now rapidly expanding in all science and engineering areas, including physical, biological and biomedical sciences. This paper presents the features of the Big Data revolution, and proposes a Big Data processing in e-business, from the data mining perspective. This big-data model involves finding of information sources, mining and analysis, user interest modeling, and security and privacy considerations. We analyze the challenging issues and importance to create new trend in e-business.

Keywords: *information technology, data collection, data processing, services, security, internet and e-business, idc, bda, iia*

I. INTRODUCTION

The speed at which business moves today, combined with the sheer volume of data created by the digitized world, requires new approaches to deriving value from data. the speed of business today and the massive amounts of structured and unstructured data being generated, organizations must find new ways of getting to data—figuring out what's in it and what to do with it. Recent advances in storage, network and compute technologies enable organizations to economically and efficiently harness big data and turn it into a potent source of business advantages. Forrester Research estimates that organizations effectively utilize less than 5 percent of their available data. This is because the rest is simply too expensive to deal with. Big data technologies and techniques represent an important advancement, because they make it efficient and affordable for organizations to tap into the 95 percent of data currently passing them by. Imagine the upside: if two companies use data with the same effectiveness, but one handles 15 percent of available data while the other is stuck at 5 percent, which enterprise is more likely to win? When used correctly, big data can yield insights to develop, refine or redirect business initiatives; discover operational roadblocks; streamline supply chains; better understand customers; as well as develop new products, services and business models.

Some Examples of Big Data in Use

(a) The U.S. federal government collects more than 370,000 raw and geospatial datasets from 172 agencies and subagencies[6]. It leverages that data to provide a portal to 230 citizen-developed apps, with the aim of increasing public access to information not deemed private or classified.

(b) Professional social network LinkedIn uses data from its more than 100 million users to build new social products based on users' own definitions of their skill sets.

(c) Silver Spring Networks deploys smart, two-way power grids for its utility customers that utilize digital technology to deliver more reliable energy to consumers from multiple sources and allow homeowners to send information back to utilities to help manage energy use and maximize efficiency.

(d) Jeffrey Brenner and the Camden Coalition mapped a city's crime trends to identify problems with its healthcare system, revealing services that were both medically ineffective and expensive[7]. While the usefulness of big data may be clear, the path toward big data productivity is not. Successfully leveraging big data insight requires a real investment in proven technologies, updated workforce skills and leadership focus. Organizations must combine three facets of strategy—technical, organizational, cultural—in order to implement a big data platform that suits the business and its objectives.

ISSN (Online): 2583-2468
Volume-2 Issue-5 || September 2023 || PP. 60-65 DOI: 10.54741/asejar.2.5.10

II. OUR DIGITAL WORLD: NEW DATA SETS, NEW POSSIBILITIES

There's no end in sight for the proliferation of data. With enterprise data volumes moving past terabytes to tens of petabytes and more, business and IT leaders face unique opportunities to capitalize on this data for competitive advantage. Companies that align their processes, operations and corporate culture to embrace and exploit big data will gain the benefit of timely, differentiated insight; those that do not risk falling by the wayside. According to International Data Consortium the Big Data technology and services market represents a fast-growing multibillion-dollar worldwide opportunity and is expanding rapidly. A recent International Data Corporation (IDC) forecast shows that the Big Data technology and services market will grow at a 27% compound annual growth rate (CAGR) to $32.4 billion through 2025 - or at about six times the growth rate of the overall information and communication technology (ICT) market[1]. It's interesting to note that the amount of information created by individuals themselves—documents, photos, music files, blog posts, etc.—is far less than the amount of information being created about them in the digital universe, according to the study. Data about data, or metadata, is growing twice as fast as the digital universe as a whole. Web sites alone generate staggering amounts of data. Facebook has more than 800 million active users, and there are more than 900 million objects (pages, groups, events and community pages) that people interact with. Facebook users spend over 700 billion minutes per month on the site, creating on average 90 pieces of content and sharing 30 billion pieces of content each month. Facebook's data infrastructure team is responsible for quickly analyzing all of that data to present it to users in the most relevant way, and to understand preferences, uses and sentiment as a basis for launching new products. "The big data and analytics market has a bright future," says Dan Vesset, program VP, Business Analytics and Big Data. "Organizations that plan accordingly will reap new benefits from built for purpose analytics in 2025 and beyond."[4]

III. RELATIONSHIP BETWEEN BIG DATA ANALYTICS AND E-COMMERCE& ITS APPLICATION

Actual, logical, quantitative, prescient, subjective, and other models are fundamental essentials for Big Data Analytics (BDA). Therefore, BDA in online business may be described as an encompassing procedure that includes the assortment, examination, use, and elucidation of information for different useful divisions with the end goal of increasing significant bits of knowledge, making business esteem, and standing out of the crowd. Hence, this definition states the thought that expository systems can be utilized to deliver noteworthy experiences. Whereas, the unmistakable distinction today is the immense electronic transactions in the advanced economy and its related information. From the exchange cost hypothesis and the new institutional financial matters perspective, with regards to financial execution of internet business firms in the developing information economy, institutional structure can play a significant role in characterizing BDA[2].

Big Data Applications in E-Commerce: Utilizing Predictive Analytics to Anticipate
Customer-Behaviour: Predictive Analytics allow us to the distinguishing proof of occasions before they happen using Big Data Analytics[3].Hence, this gathered information can empower e-commerce businesses to foresee which item scan be customers' priority when it comes to purchase based upon customer behaviour and past deals on the website. With this, supply-chain can be managed more efficiently by predicting product demand in nearest future.
Personalized and Customized Products: Big Data Analytics encourages serving clients with customized administration or customized items. It offers promotion of several products under distinct categories. Also, it has been indicated that personalization can improve the sales by 10 % or more and may give five to multiple times the return on investment on advertising uses[3][4]. Hence, distributing personalized interactions can be a powerful tool to maximize profits.

IV. PREDICTIONS FOR THE BIG DATA ANALYTICS MARKET

The big data and analytics market will reach $125 billion worldwide in 2025[11], according to IDC. Both IDC and The International Institute of Analytics (IIA) discussed their big data and analytics predictions for 2025 in separate webcasts. Here are the highlights: Security will become the killer app for big data analytics Big data analytics tools will be the first line of defense, combining machine learning, text mining and ontology modeling to provide holistic and integrated security threat prediction, detection, and deterrence and prevention programs. (IIA) The Internet of Things (IoT) will be the next critical focus for data/analytics services. (IDC) While the IoT trend has focused on the data generation and production (sensors) side of the equation, the "Analytics" of Things is a particular form of big data analytics that often involves anomaly detection and "bringing the data to the analytics." (IIA) Adoption of technology to continuously analyze streams of events will accelerate in 2025—it's all about speed and small units of data. IoT back end as a service (BaaS) will emerge, as players—including Amazon, IBM, and Microsoft—continue to stitch together a wider variety of platform as a service (PaaS) services, including stream processing, data triggers, indexing and synchronization, and notifications, into more tightly integrated offerings directly marketed to the growing community of IoT developers. (IDC)

ISSN (Online): 2583-2468
Volume-2 Issue-5 || September 2023 || PP. 60-65 DOI: 10.54741/asejar.2.5.10

V. FOCUS

A. Buying and Selling Data will become the New Business

70% of large organizations already purchase external data and 100% will do so by 2024[12]. In parallel, more organizations will begin to monetize their data by selling them or providing value added content. (IDC) Companies will double their investment in generating new and unique data. "You can't go into a data-based business without some unique data that gives you competitive differentiation." 2025 will mark an inflection point of intentional investment by mainstream firms in generating and monetizing new and unique data sources. (IIA)

B. Companies will Invest in Self-Service, Automation, and Augmentation to Answer the Skills Shortage

Shortage of skilled staff will persist. In the U.S. alone there will be 181,000 deep analytics roles in 2018 and 5x that many positions requiring related skills in data management and interpretation. (IDC—note that data was not provided for the supply side of the equation). Visual data discovery, an important enabler of end user self-service, will grow 2.5x faster than the rest of the market, becoming by 2018 a requirement for all enterprises. (IDC) Automated decision-making will come of age in 2025 and the organizational implications will be profound. The very way that firms operate and organize themselves will be questioned this year as common workflows become rationalized through analytics. Key to success is the transparency of the automated systems and preparing managers "to occasionally look under the cover" of established models and algorithms. (IIA) Google's announced Tuesday an automated statistician research project which aims to build an "artificial intelligence for data science." But augmentation, rather than automation, may be the better option with knowledge workers. In 2025, companies will begin considering how to augment knowledge work jobs rather than automating them—moving from artificial intelligence to intelligent augmentation. Analytics, machine learning, and cognitive computing will increasingly take over the jobs of knowledge workers, and we will become more conscious of this in 2025[15]. (IIA)

By 2025, half of all consumers will interact with services based on cognitive computing on a regular basis. Current personal services such as Apple Siri, Microsoft Cortana, and Google Now will raise expectations for employees to seek access to similar services in the enterprise. In 2025, PaaS competitors will step up their efforts to compete in the cognitive space[16]. (IDC)

C. Image, Video and Audio Analytics will become Pervasive

Rich media analytics will at least triple in 2025 and emerge as the key driver for big data technology investment. Already half of large organizations in North America are reporting use of rich media (video, audio, image) data as part of their big data analytics projects, and all large organizations will analyze rich media in five years. (IDC)

D. Storytelling will be the Hot New Job in Analytics

The most important attribute sought in candidates for big data analytics jobs is communications skills. As organizations run into obstacles in understanding and adopting analytics, they rightly place more emphasis on communication, which is not a strength of most analysts. cloud-based big data and analytics:- IDC predicts cloud-based big data and analytics will grow three times faster than spending for on-premise solutions. This poses challenges from the point of view of storage, backup and data management, but also opens the opportunity to exploit some of these data through analytics into useful applications to make better and faster decisions. The research firm says organizations are changing how they measure their operations, interactions with customers, and resource allocations. Faster access to more relevant data and constant experimentation is creating a further gap between leaders and the rest of the organizations. It is also creating new challenges for IT and business leaders tasked with their organization's big data and analytics strategy and execution.

E. Predictive Analytics for Disease Prevention

By analysing large datasets, including patient records, genomic data, lifestyle information, and environmental factors, healthcare providers can predict and prevent diseases more effectively. Predictive analytics will play a crucial role in identifying high-risk patients and implementing preventive measures.

F. Real-time Health Monitoring

IoT devices and wearable technologies can collect real-time health data, generating vast amounts of information. Big data analytics will focus on processing this continuous stream of data to monitor patients' health in real-time, allowing for immediate intervention in case of emergencies or sudden changes in health conditions.

G. Telemedicine and Remote Patient Monitoring

Big data analytics will enhance telemedicine services by enabling remote patient monitoring on a large scale. Patients' vital signs and health data can be continuously monitored, allowing healthcare providers to offer timely interventions and reducing the need for frequent hospital visits.

ISSN (Online): 2583-2468
Volume-2 Issue-5 || September 2023 || PP. 60-65 DOI: 10.54741/asejar.2.5.10

H. Climate Change Studies

Big data analytics will be instrumental in studying long-term weather patterns and climate change. Analyzing historical weather data alongside current and future projections will help scientists gain insights into climate change trends, allowing for better mitigation and adaptation strategies.

I. Improving Numerical Weather Prediction (NWP) Models

Big data analytics will refine NWP models by assimilating diverse and high-resolution data. Assimilation techniques will integrate observational data into models in real-time, improving the accuracy of weather predictions and extending the forecast lead times.

J. Crop Health Monitoring

Big data technologies will focus on real-time monitoring of crop health. Remote sensing data, including satellite imagery and drones equipped with sensors, will be analyzed to detect diseases, pests, and nutrient deficiencies. Early detection allows farmers to take timely corrective actions, reducing crop losses.

K. Predictive Analytics for Pest and Disease Management

By analyzing historical and real-time data, predictive models can be developed to forecast pest and disease outbreaks. Farmers can proactively implement pest control measures, reducing the need for chemical interventions and minimizing environmental impact.

VI. BIG DATA IN DEEP LEARNING

Big data plays a significant role in the field of deep learning. Deep learning algorithms, especially neural networks, require large amounts of data to train effectively. Big data provides the vast datasets needed to train these complex models, allowing them to learn patterns and representations from diverse and extensive information. Here's how big data impacts deep learning:

A. Increased Training Data

Deep learning models, particularly deep neural networks, require substantial amounts of data to learn complex patterns. Big data provides a diverse and extensive dataset for training, allowing these models to generalize better to new, unseen data.

B. Improved Model Accuracy

With big data, deep learning models can be trained on diverse and representative datasets. This diversity helps in capturing intricate patterns within the data, leading to more accurate models. Deep learning algorithms excel when they can learn from a large variety of examples.

C. Enhanced Feature Learning

Deep learning algorithms automatically learn features from the data during the training process. When fed with big data, these algorithms can discover high-level features and representations, enabling them to understand complex relationships within the data.

D. Scalability

Big data technologies provide the infrastructure necessary to handle massive datasets. Deep learning algorithms, especially when applied to tasks like image and speech recognition, often require large amounts of data. Big data tools and platforms enable the storage, processing, and analysis of this data at scale.

E. Real-time Processing

Big data technologies, combined with deep learning models, enable real-time processing of vast streams of data. This capability is essential for applications such as real-time fraud detection, recommendation systems, and autonomous vehicles, where decisions need to be made instantaneously based on incoming data.

F. Challenges and Considerations

Managing and processing big data for deep learning come with challenges, such as data pre-processing, storage, and computational resources. Additionally, ensuring data quality and addressing biases within the data are crucial considerations to make deep learning models effective and fair.

ISSN (Online): 2583-2468
Volume-2 Issue-5 || September 2023 || PP. 60-65 DOI: 10.54741/asejar.2.5.10

VII. CHALLENGES AND DRAWBACKS OF BIG DATA ANALYTICS IN E-COMMERCE

Big data analytics has become increasingly important in the field of e-commerce, enabling businesses to make data-driven decisions, optimize operations, and improve customer experiences. However, there are several challenges and drawbacks associated with big data analytics in e-commerce:

A. Data Volume and Velocity

E-commerce platforms generate vast amounts of data in real-time. Managing and processing this high volume of data can be challenging, especially when data is streaming in rapidly. It requires robust infrastructure and storage solutions.

B. Data Variety

E-commerce data comes in various forms, including structured, semi-structured, and unstructured data (e.g., transaction data, user reviews, images, videos). Integrating and analyzing these diverse data types can be complex.

C. Data Quality

Data quality is crucial for effective analytics. Inaccurate or incomplete data can lead to incorrect conclusions. Cleaning and validating e-commerce data can be time-consuming.

D. Privacy and Security Concerns

E-commerce businesses handle sensitive customer information, such as personal details and payment data. Maintaining the privacy and security of this data is a significant concern, especially with the increasing number of data breaches and regulations like GDPR and CCPA.

E. Regulatory Compliance

E-commerce companies must comply with various data protection and privacy regulations, which can vary by region. Ensuring compliance in data collection, storage, and processing can be complex.

F. Scalability

As an e-commerce business grows, the amount of data it generates also increases. Ensuring the scalability of the analytics infrastructure to handle this growth is a challenge.

G. Analytical Talent

Skilled data scientists and analysts are required to make sense of big data. Finding and retaining these talents can be expensive and competitive.

H. Complexity of Algorithms

Analyzing e-commerce data may require complex machine learning and data mining algorithms. Implementing and fine-tuning these algorithms can be challenging.

I. Costs

Building and maintaining the infrastructure for big data analytics can be costly. Hardware, software, and personnel expenses can add up quickly.

J. Data Silos

E-commerce businesses often have data spread across various departments and systems, leading to data silos. Integrating and unifying this data for meaningful analytics can be difficult.

K. Real-time Processing

E-commerce businesses often need real-time insights to make quick decisions, such as adjusting pricing or managing inventory. Real-time processing can be resource-intensive.

L. Customer Trust

Collecting and analyzing customer data for personalization and targeting can raise concerns about privacy and ethics. Businesses need to balance the use of data with maintaining customer trust.

M. Data Interpretation

Big data analytics can provide a wealth of information, but interpreting and making actionable decisions from this data can be challenging.

ISSN (Online): 2583-2468
Volume-2 Issue-5 || September 2023 || PP. 60-65 DOI: 10.54741/asejar.2.5.10

N. Competitive Pressure

E-commerce is a highly competitive industry, and staying ahead often depends on the ability to extract insights from data faster and more accurately than competitors.

Despite these challenges, big data analytics can provide significant benefits for e-commerce businesses. Overcoming these challenges requires a strategic approach that includes investment in technology, data governance, and talent while keeping a strong focus on data security and compliance.

VIII. CONCLUSION

Big data is a disruptive force that will affect organizations across industries, sectors and economies. Not only will enterprise IT architectures need to change to accommodate it, but almost every department within a company will undergo adjustments to allow big data to inform and reveal. Data analysis will change, becoming part of a business process instead of a distinct function performed only by trained specialists. Big data productivity will come as a result of giving users across the organization the power to work with diverse data sets through self-service tools.

Once companies begin leveraging big data for insight, the action they take based on that insight has the potential to revamp business as it is known today. If a marketing department can gain immediate feedback on a new branding campaign by analyzing blog comments and social-networking conversations, achieving the vast potential of big data calls for a thoughtful, holistic approach to data management, analysis and information intelligence. Across industries, organizations that get ahead of big data will create new operational efficiencies, new revenue streams, differentiated competitive advantage and entirely new business models. Business leaders should begin thinking strategically about how to prepare their organizations for big data—and big opportunities.

REFERENCES

1. Al-Debei, M., & Avison, D. (2010). Developing a unified framework of the business model concept. *European Journal of Information Systems, 19*(3), 359–376.
2. Amit, R., & Zott, C. (2001). Value creation in E-business. *Strategic Management Journal, 22*(6), 493–520.
3. Buytendijk, F., Kart, L., Laney, D., Jacobson, S., Lefebure, S., & Hetu, R. (2013). Toolkit: Big data business opportunities from over 100 use cases. *Gartner (G00252112)*.
4. CEBR. (2012). Data equity – Unlocking the value of big data. *Centre for Economics and Business Research Ltd.*
5. Chen, Y., Kreulen, J., Campbell, M., & Abrams, C. (2011). Analytics ecosystem transformation: A force for business model innovation. in *SRII Global Conference*, pp. 11–20.
6. Chesbrough, H., & Rosenbloom, R. (2002). The role of the business model in capturing value from innovation: Evidence from xerox corporation's technology spin-off companies. *Industrial and Corporate Change, 11*(3), 529–555.
7. Han, J., & Kamber, M. (2006). *Data mining. Concepts and techniques*. Elsevier, Morgan Kaufmann, San Francisco, CA.
8. Han, J., Kamber, M., & Pei, J. (2011). *Data mining. Concepts and techniques*. Elsevier Science, Burlington.
9. Hedman, J., & Kalling, T. (2003). The business model concept: Theoretical underpinnings and empirical illustrations. *European Journal of Information Systems, 12*(1), 49–59.
10. Kart, L., Heudecker, N., & Buytendijk, F. (2013). Survey analysis: Big data adoption in 2013 shows substance behind the hype. *Gartner*.
11. Kaufman, L., & Rousseeuw, P. J. (1990). *Finding groups in data. An introduction to cluster analysis*. Hoboken, NJ: Wiley-Interscience.
12. Otto, B., & Aier, S. (2013). Business models in the data economy: A case study from the business partner data domain. *Proceedings of the 11th International Conference on Wirtschaftsinformatik (WI 2013) in Leipzig, 1*, pp. 475–489.
13. Petter, J., & Peppard, J. (2012). Harnessing the growth potential of big data. Why the ceo must take the lead. *EMC*.
14. Zott, C., Amit, R., & Massa, L. (2011). The business model: Recent developments and future research. *Journal of Management, 37*(4), 1019–1042
15. Le, T., & Liaw, S. (2017). Effects of pros and cons of applying big data analytics to consumers' responses in an e-commerce context. *Sustainability, 9*(5), 798. doi: 10.3390/su9050798.
16. Yamaguchi, K. (2015). 7 limitations of big data in marketing analytics - Marketing land. Available at: https://marketingland.com/7-limitations-big-data-marketing-analytics-117998.