

Increasing Under Utilised Data in India: Opportunities and Challenges

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Abstract

India, a country with a population of 1.33 billion has observed a substantial increase in the number of smart phones and internet users. This increase in internet users has not only changed the way Indian spend their time but has also led to generation of huge chunks of structured and unstructured data in India. In today's world where data of consumers is significant, this rise of internet users in India can change the game. This study focuses on how this increase in underutilised data in India, especially unstructured data can provide various opportunities and challenges to businesses, government and healthcare sectors in India.

Keywords: *Underutilised Data, India, Unstructured data, big data, data science.*

1. Introduction

Introduction of telecom services from Jio has led to a revolution in the telecom industry and has made internet affordable to the consumers in India. According to India 2021-forecasts report (Cisco, 2016) published by cisco by the year 2022 India's internet users will increase up to 829 million which is more than double the current users. Cisco also states in its reports that the usage of data will also increase from 107 petabytes in year 2017 to 646 petabytes in the year 2022. Average mobile data consumption will also increase from 3.5 GB per month to 17.5 GB per month by the year 2022. Indian customers have surpassed US in number of downloads. This surge in internet usage has led to substantial increase in generation of structured and unstructured data in the country and there is increase in generation of data, there are increasing opportunities for private and the public sector to exploit the data and efficiently use this data to gain insights which

might improve the major problems in India like the high crime rates. Data analytics has provided companies an advantage to gain insights and improve their products and services. As the technology has advanced with advancing time, technologies like Data science and A.I. have enabled to analyse and interpret huge chunks of data to find meaningful conclusions. Technologies like Big Data has not only helped business entities but have also provided insights for improvements healthcare, financing institutions and Government's execution of policies.

2. Literature Review

Madeshian (2015) in his study talks about the unstructured data in companies and how different techniques of Big data can be employed to improve efficiency. Primary focus of the researcher is to analyse and survey unstructured data and its challenges. According to the researcher unstructured data is relatively an untapped source of insight and can help in

identifying vital information which was before beyond the scope. Organisation can make decision more efficiently, tap on different business opportunities and monitor market trends by using Data science to analyse the data. Researcher also highlights new technologies of analysing data which are more efficient and cost-effective. These new technologies re-define the way of managing data by leveraging the power of distributed grid.

Chahal, Goel and Maity (2018) in their article talk about application, challenges and future of data science. According to researcher's data science is blend of Mathematics expertise, Technology and Business acumen. Researchers also provide explanations on various technologies related to Data science. According to this study Data science in rapidly being adopted by business. Data science according to researchers is efficient for businesses to gain insights which are crucial for decisions. Researchers conclude that Data science can add substantial values to businesses. Companies can use it for their insight's management, workflows, hiring, financial decisions and make better decisions.

Jayalakshmi and Nimmatisathees (2016) in their study talks about the advancing challenges of unstructured data in data analytics. Researchers have quoted IBM, "80% of data captured today is unstructured. According to researchers unstructured data is the elements in the data have no structure. According to researchers unstructured a data is growing at a substantial rat. According to researchers Data analytics helps companies to make efficient decision using data which was previously unavailable. New application of big data can also make unique insights helpful for the company. Researcher also support the use of visualisation in their study. According to the researchers, there is a need to convert the data into an interactive format and to enable this visualisation can be employed. Visualisation of data helps in finding hidden patterns in the data. Researchers also highlight the

need for security of data as a significant issue. According to researchers there is need for companies to respect private data and keep it secure.

Provostand Fawcett (2013) in their study talk about relationship of data science to Big data and Data-driven decision making. According to the researcher's companies worldwide have realised the Significance of data and started hiring more data scientists. Academic institutions have also started programmes for data science. According to researcher's application of data science in business are broadly in marketing and general customer relationship management. Data science can also be sued in finance for credit rating and fraud detection. Companies like amazon and Walmart apply data science technologies in their business in almost every functional department. Researchers also shows hoe Walmart used predictive analysis to tackle demand during hurricane. Researchers also highlights the practice od Data-driven decision making. According to researcher's data science could be used to me relevant advertisements rather than advertisements based on personel judgement. Researchers have also found out that data driven firms are more productive than other firms and also leads to higher returns. Researchers conclude by highlighting the fact that there is more to data science just than algorithms, tools and techniques. Success in today's world requires companies to adopt data science and focus on how fundamentals apply to a particular problem in business.

alshura, zabadi and abughazaleh (2018) in their article talks about challenges, opportunities and trends in data analytics in marketing. According to researchers there are growing number of research work in this area which indicates increasing utilisation of data science in business for better productivity and growth. According to the researcher's big data has revolutionized marking function in a company. Data analytics has helped to make marketing more efficient and insightful.

According to the researchers with increasing amount of data, managing and getting knowledge from huge chunks of data provides opportunities and also brings challenges. According to the literature reviewed by researchers study Big data will soon become the new normal but is not agreed by the researchers. According to the study data analytics have transformed economies and kicked-off a new phase of growth. Data can provide a competitive advantage to firms. According to the study Big data can help marketers in various ways, by helping in providing consumers insights. Researchers conclude by saying that there is a gap between the academics and practices. Results show that numerous companies have started to narrow down this gap and started to adopt data analytics.

Tambe (2014) in his research has conducted an empirical study to understand early returns to investment in Big data technology. According to the researcher US business was on the cusp of revolution in management. Companies have adapted data driven management rather than management based on personal judgement. According to this study most of the firms in US are capturing huge chunks of data from social media, browsing patterns, sentiments of consumers, internet usage. Firms are using this data to produce insights that will help the company in taking decisions. This study also highlights that companies are facing problems like lack of independent capability to analyse data and hence there has been increasing interest in potential returns from data analytics companies. These data analytics companies, according to many academic institutions will drive a wave of innovation. This study draws conclusion from the data collected and according to the data the Big Data industries are still maturing and has recently seen an increase in the academic programmes been offered by major institutes.

This study focuses on whether companies that rely on data science for decisions lead to better

performance. Researchers have undertaken a detailed survey of 179 large public firms. According to the findings of the study researchers found out that there was an increase productivity and output by about 5-6%. According to the study data revolution has led to companies gathering data of consumers, suppliers, partners and competitors and this has led to technologies like Economic resource planning, supply chain management, and customer relationship management. Apart from regular business data companies are also tapping data from outside sources. Companies are also looking for unstructured data from sources like mobile phones, vehicles, automation systems and other automated devices. This study also mentions information theory, which suggests that more accurate and specific information enables greater use of information. In decision making and thus lead to more efficient performance. Researchers based on their findings of co-relation highlight that data driven decision making is a relatively new phenomenon and is still in process of circulation across the firm. This study both through literature and empirical study suggests that there is a positive impact of data driven decision making on the performance of the company.

Baldacci & Marinova (2018) in their study focuses on unstructured data and marketing. According to the study there is a substantial increase in unstructured data. This rise in unstructured data when analysed has great potential for marketing decision. According to this study a significant number of insights can be derived from analysis of unstructured data and can be used by managers for marketing and gain competitive advantage. There has also been a substantial increase in technologies like artificial intelligence has made unstructured data much more important for businesses. This study provides detailed information about unstructured data. This study also shows the impact of

unstructured data on advertising, retail management, product management and design, brand management, information extraction, marketing intelligence, service management, personnel selling and sales management and information processing. According to the researchers technology is helping in enabling companies to move beyond analysing textual unstructured data and analyse voice, video and image data. This extent of unstructured data will help companies to adapt relevant marketing strategies and take precise decision based on the insights. There are three benefits of unstructured data highlighted by the researcher. Non-numeric, multi-faceted and multiple facets aspects of unstructured data provides significant leverage in marketing. This study also reveals the increasing use of geographical data to target different segments worldwide.

Ogbuokir, agu and undanor (2015) in their article talk about the role big data could play in helping develop medium and small enterprises and fuel regional growth in developing country. According to the paper big data has a significant potential which is often not utilised by small and medium businesses especially in developing countries. Researchers convey that data analytics is not just for large companies, small businesses can also adopt big-data to make better decisions based on data insights to develop their businesses. There are some challenges for small and medium businesses to use data analytics, one of the problems is hiring specialist. There is a shortage of data scientists in developing countries. Researchers have extensively reviewed articles and highlighted the role data analytics could play in growth of SMEs. Big data will let small firms enjoy flexibility in decision making. Adopting this system according to the researchers should be comparatively simple and cost effective. This research also highlights various tool offered by companies like IBM to help businesses in data analytics. These tools like IBM's Watson analytics offers data analytics with

simple language and no pre-requisites of specialised knowledge such as coding. This tool provides mining, analysing and analytics in one software with a relatively easy interface. SMEs can also face problems of implementation, lack of management expertise and lack of capital

Dayal, Garg and Shrivastava (2014) in their article talk about big data in relation to India. According to the study improvements in the technologies have led to increase in data available to companies and organisations in India. Research suggests that businesses and government can enjoy the benefits of data analytics, however it still requires wide-ranging planning and a clear process of implementation. This study focuses on two aspects, public sector and businesses. According to this study, data can help public sector in better decision making. This study highlights the cases where data analytics was used by government organisations to take accurate decision and improve policies. This study also focuses on challenges like privacy when it comes to use of data by the government and businesses. Apart from the challenges of privacy issues there are problems like, lack of institutional mechanisms and lack of infrastructure. According to the researchers lack of knowledge of data analytics or Big data can pose a as threat to security of data and at the same time a barrier for social and economic development. Apart from public sector this research also shows the potential of big data in healthcare industry, law and enforcement, business and economic systems. This study also includes some initiative taken by different countries in order to improve public infrastructure using data analytics. Speaking of India, there is a need for more efforts to tap the potential of this technology. According to this study in 2014 there is not much data being collected and there is a need for more data to be captured. Government in India can gain a substantial amount of insight if the technology is planned and implemented adequately. There is a good scope for data science

in India but need support from the government by public expenditure in infrastructure and human resource.

Roy (2017) in his study talk about the data analytics initiatives taken in India. According to the researcher big data is gain a strong momentum and there is a need for s sustainable eco-system with a strong bond between businesses, governments and institution. This study also mentions the initiatives taken by the Indian government to tap the opportunities in the data analytics by launching an open government data portal. This study highlights the rising use of internet and mobiles phones in India, and rise in data every day. This rise in data has led to need for capturing the opportunity. This study also shows figures conveying the message of increasing potential of data in India. According to the researcher government initiatives like ‘Digital India’ can help boost the industry and provide opportunities to various other industries. This study also highlights the importance of importance of India being a prime location for off-shoring data analytics. This study also suggests that there is a scope for increase in employment in bid-data sector and overall big data can be helpful for India.

Increasing structured and unstructured data in India

Internet usage leads to generation of two different types of data namely, structured and unstructured data. Structured data is the data which is organised moreover has a defied model whereas unstructured data is the data which is generated from audio, video, social media. Unstructured data does not have a predefined model and is not organised. Unstructured data consists of 80% of data captured by the companies. As compared to structured data it is difficult to extract information or insights from unstructured data because of its complex nature. This unstructured data hold greats potential to provide value by helping in making

decision based on insights. These insights from untapped data in India can lead to significant help by providing insights for accurate decision making. This data can be used in different fields. Businesses, governments and healthcare industry in India can use these data to improve their current state and lead to growth and development in country’s economy and well-being.

3. Businesses

Analysing huge chunks of structured and unstructured data primarily helps in making Data-driven decisions. These decisions are based on insights generated by analysing data. These insights can not only help large companies but also small and medium sector enterprises (SMEs) in India. Technology like Big data can help process data with high velocity, variety and veracity and thus make it easy for companies to extract insights from complex data. Businesses in India can use data science in various activities ranging from marketing to customer relationship management. According to a survey conducted on 179 large public limited companies, it was found out that companies which made data driven decision experienced a 5-6% growth in their financial position. As the country is observing increase in generation of data, companies in India can leverage data to gain competitive advantage. Companies in India can use data science to improve their advertising, sales, promotions, CRM, information transmission, retail management, service management, supply chain management and marketing intelligence. Companies can also use data science to improve customer satisfaction for e.g. predictive analysis can be used by companies to predict the demand of products and services and allow companies to maintain adequate stock level and provide goods and services accordingly.

4. Healthcare

Indian healthcare market is increasing at an CAGR Of 17% and is expected to reach \$280

billion by the year 2020. Increasing income levels, ageing population and raising healthcare awareness in India is set to fuel the healthcare industry in India. As the healthcare sector is observing growth, there is still lack of infrastructure and innovation. Healthcare industry India can employ technologies like data science and AI to improve their position in India. Growth in the sector, leading generation of data can help institution to analyse data and make factual decision which were previously based on assumptions. Big data technology can help in changing the face of healthcare in developing countries like India. Data analytics can help professionals to analyse past records and trends and use current data to monitor and prevent health problems, data can also help in increasing diagnostic accuracy, provide medicines precisely rather than on assumptions and advance pharmaceutical researches. Data analysis can also help in optimising

5. Public Sector

Governments across the globe are leveraging data to improve effectiveness and efficiency of decision making. Los Angeles police department is using predictive analysis to identify where the crime may occur using real time data and past data and act accordingly. Boston street bump project is also another example of how public institutions can use data to provide better facilities to the public. Boston street bump project was undertaken by the Boston mayor's office. This project extensively uses data from accelerometer and GPS sensors of smartphones to improve potholes on the road. These projects show how data can be used to improve a country's infrastructure. India being a developing country lacks infrastructure and has often observed policies undertaken by governments which are based on assumptions rather than factual data, but now public sector has an opportunity to tap on the increasing underutilised structured and unstructured data which can help various public institutions to make

data driven decisions. Government can use past data and make use of real time data to make efficient decision to improve the state of various public institutions in India. Institutions in India can now finally overcome the challenge of lack of data with this increasing generation of data. Government of India also plays a major role in developing infrastructure in India and maintain unemployment rate. Developing an infrastructure in the field of data science can provide various employment opportunities and alleviate the high unemployment rates in India. Adapting the technology for Data analytics will lead to requirement of specialists and low skill individuals on a large scale and this requirement will further add to the improve the situation in India. Adapting data analytics will fuel the development and support the growing economy of India.

6. Challenges

Adoption of Technologies like Data science, big data and Artificial intelligence in India to leverage the increasing structured and unstructured data may provide substantial benefits, but it is important to understand various challenges and drawbacks that might hamper the process. As these technologies are still developing in countries like India, it is important for the government to ensure adequate support in its development and regulation. Following are some of the challenges and drawback India might have to face:

8.1 lack of infrastructure

One of the main problems faced in India is the lack of infrastructure in the country. There is lack of proper regulation in respect to use of data, there are no adequate guidelines or policy formulated by the government. Apart from this there is also a shortage of human resource specialised in data analytics and artificial intelligence in India. Understanding of this technology by investors and stakeholder is also very low in India as compared to other rapidly growing countries.

8.2 lack of Past data

Documentation in India is still based on traditional methods. Public offices in India have maintained traditional databases and therefore huge chunks past data in India is still stored in archives of the Indian government. This data is not useful unless it is on the system and hence this raw data may hinder the process of analysis of data. This lack of past data may not allow government to analyse the data or enable predictive analysis to make insightful decisions.

8.3 lack of reliable data by the government

Government of India has accepted deficiency in the official data. Economists and investors worldwide have shown lack of confidence on the data provided by the government. This problem of unreliable data may hamper the opportunities available to the companies and public institutions. It is of prime importance for the government of India to undertake necessary remedial actions.

8.4 Privacy and Anonymity

Cybercrimes in respect to breach of privacy have already started to make headlines. Internet consists of personnel and sensitive information of users which can be unethically used by companies and government for personnel gains. It is important to protect this data and prevent it from unauthorised use. It is important for Indian government to formulate regulations in respect to use of data to prevent the unethical use of personnel data.

8.5 Security of data

Apart from ethical use of data, it is important for companies to maintain secrecy of data and prevent it from breaches. Companies across the world has observed data breaches which has led to negative impacts on the company. Level of security in India is comparatively very low and also lack initiatives from the government, therefore it is important for the government and the private

industry players to formulate and maintain adequate system which ensures the safety of data.

7. Conclusion

India is amongst the fastest growing countries in the world. India is counted amongst the fastest growing economies in the world with a growth rate of 7.3%. India is also a prestigious market for large multinational companies who have invested heavily in India. Almost all large international corporations are setting up their research and development labs in India, but despite this growth and innovation there is miniscule adoption of the technologies like Big data, Artificial intelligence and machine learning. There is lack of understanding in these area by the officials and investors. These technologies have a great potential in India. Increase in generation of structured and unstructured data can provide various opportunities which allow businesses to gain operational and financial advantages and allow public sector in India to bring radical changes which will fuel the development in India. Apart from the opportunities it is important to look out for the solutions for the arising challenges. It is important for the government to draft policies and regulation in respect to usage and security of data. Increasing generation of data may lead to negative impact on the country if not adequately regulated.

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