Impact of Data Analytics in Changing the Future of Business and Challenges Facing It

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Abstract- Data Analytics refers to a comprehensive approach that makes use of both Qualitative and Quantitative Information in order to draw valuable insights and arriving at conclusions based on the extensive usage of statistical tools accompanied by explanatory and predictive models running over the data. It tries to understand the behavior and dynamics of businesses thereby leading to improved productivity and enhancing business gains by helping with appropriate decision making. Considering the intensified disruption caused by recent revolution in the field of Data Analytics, this articles aims to cover the potential impacts that Data Analytics could have over the already existing businesses and how new entrants, especially across the emerging economies, could make the best use of Data Analytics in gaining an edge over their competitors. It also aims to deep dive into the challenges faced by businesses while adopting or moving to Data Analytics and how they can overcome those challenging barriers for a successful future.
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"We are generating more data than ever before- 90% of the data that we have today is generated in last 2 years alone. This data is coming from a variety of different sources such as voice, text, transaction, sensor, chat, images, videos etc. To handle this fast-moving, heterogeneous and multimodal data we need to get more entrenched in machine learning and deep learning to make real-time analytics driven decisions that will bring maximum value to the customers and companies alike" – Ratnakar Pandey (Head Analytics, Kabbage)

Index Terms- Impact of Data Analytics, Decision Making, Challenges Facing Data Analytics, Business, Predictive Modeling

I. INTRODUCTION

There's been a strong buzz going across the world with regards to Analytics which has been there for more than a decade and it has certainly undergone major changes but still one thing remains stagnant and that is "Data Analytics is still the hottest technology space around industries helping businesses to thrive and stay ahead in competition". Analytics has become an imperative part of Digital Technology transformation, thanks to the amount and diversified datasets that have skyrocketed in the last few years where the last 2 years or so accounts for more than 90% of the current data that is being processed by the Industries. To come up with the solutions for raising concerns in future, we have to deep dive back into the data and data science processing.

Data Analytics is often conceptualized as a concept used only by Technology driven industries which is not a correct, speak about any industry ranging from logistics and supply chain management, healthcare, fashion, online e-commerce websites or manufacturing industries you will find Data Analytics making its presence over there and helping them to make better decisions. Data has become such a vital and integral part of every organization that you need to analyze and run statistics over your data to gain valuable insights about your customer behavior and future market prospects. This is where Data Analytics comes into the picture and help the organizations or businesses to improve their productivity and enhance profitability by attaining future goals.

With the proper usage of Data Analytics, Data can be easily transformed into actionable knowledge and mitigating potential risk to the organization. Data and Analytics are already shaking up multiple industries and their effects will be more pronounced and be dominating once the full effect of data analytics is realized and is being adopted by the majority of the masses. Data Analytics comprises of an array of technology solutions that starts from Data Generation and its collection, moving towards data aggregation and then running data analysis by making use of technologies like Big Data, Machine learning, Statistical analysis tools etc. Analytics comprises of different horizons like Data Science, Big Data, and Data Analytics, but one must understand that with the growing demands these all three horizons are working together in collaboration with each other in driving significant insights of businesses.

Data Analytics is concerned with taking out insights from raw data and when the data become humongous in size of volumes that's where Big data comes into action helping in data aggregation and usage of innovative forms of information processing to get detailed actionable knowledge, valuable insights, decision making, and process automation.

Figure 1: Data Analytics Process (Source: *Author*)

The above diagram aims to show how data analytics process works in brief which usually starts from Initial stage of data gathering from various sources, after which data is analysis by doing cleaning and modeling, then moved into the Visualization part where data is visualized using sophisticated tools like Tableau or QlikView, post which it available for publishing and end user consumption.

II. HOW IS DATA ANALYTICS IMPACTING THE DIFFERENT INDUSTRIES WORLDWIDE

"Analytics will define the difference between the losers and winners going forward," says Tim McGuire, a McKinsey director.

If you aren't aware how advanced analytics is reshaping the future of businesses, it's high time you should figure out how your business can reap the benefits of Data Analytics. Established traditional business models are now under attack and are totally disrupted by Digital Transformation. No longer can companies now succeed if they try to aim blindly at their potential customers. You need to take a deep dive into the powerful world of data to draw informative insights and to understand the changing dynamics and behavior of your customers. Speak about any industry and you will find data analytics penetrating its waves in there ranging from customer experience management industry to heavy manufacturing industries, big data, internet of things and digital transformation are taking a toll on the already existing traditional business models, increasing efficiency, providing better profitability and adding to the bottom line.

Over 90% of the Companies are highly considering advanced analytics and big data as a strategic priority and as much as 80% companies are said to believe that their industry will be completely affected and revolutionized with data analytics in the next 5 years or so. Recently Tencent holdings limited announced an investment of whooping $1.1 billion in Ola, one of the leading players in the rideshare market, that will help to establish its operations in data analytics and to get better insights about their

customers. Companies embracing the full benefits of data analytics won't just hold a competitive advantage over their peers but also help to transform their existing business models and industries by driving growth in new emerging sectors.

Businesses are strongly affected by leveraging the powerful benefits of Data Analytics. Here below are few insights across different industry verticals how data analytics is helping them to make appropriate decisions.

(i) Financial companies and Investment banking companies are making use of Predictive modeling to analyze their fund performances and do competitive analysis. Also using tools for performing dividend and interest recalculations.

(ii) HR Industry is seeing a huge reform with the introduction of HR Analytics and People Analytics. Making use of advanced analytics to hire the best-fit candidate and to screen potential candidates for desired profile. Using ex-post CV analysis to check for the effectiveness of HR policies and procedures.

(iii) Logistics and supply chain management industries are gaining huge benefits where data analytics has helped to cut down their costs and increase their profitability. Analyzing GPS/Satellite navigational data that tracks the movement of fleets of vehicles carrying supplies to gain more detailed insights at a deeper level than before, where the vehicles are going and what supplies they are carrying with so that fewer can travel shorter distances and save costs.

(iv) Large Telecom companies are also benefiting hugely by making extensive and effective use of data analytics to analyze the bill related frauds. Companies have been well able to keep a track of the fraudulent use of mobile handsets, unauthorized usage of accounts and SIM card cloning.

(v) Data Analytics is being employed to evaluate the impact of health and safety training on accidents in extractive industries and thus helping to save lives.
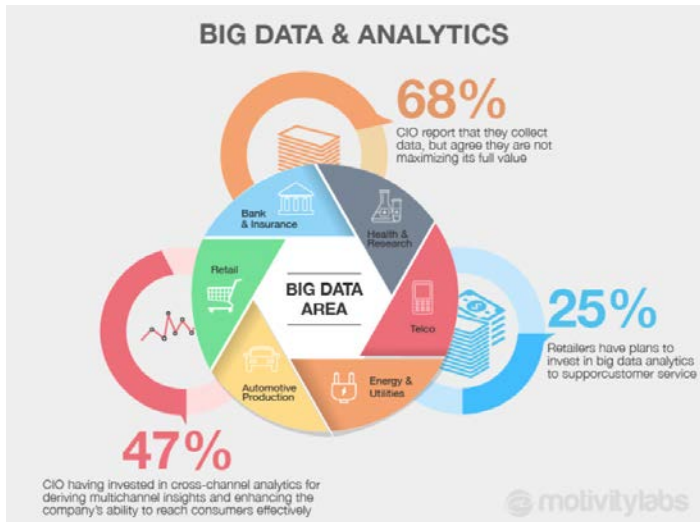
Figure 2: Impact of Big Data & Analytics on Industries (Source: *Motivitylabs*)

III.   BIG DATA AND DATA ANALYTICS IMPACT ON BUSINESS MODELS

Digital transformation has already disrupted the traditional business models and the newer business models relying on big data and data analytics are getting improved and evolving with changes. Below are some valuable key insights on how it is transforming the Business models.

(i)   *Generating Valuable Business Insights* – Big Data has the capability to segment the data and channelize the insights by extracting data from potential resources. e-commerce companies like Amazon and Alibaba are using data to their advantage by carefully analyzing the behavior of customers, their preferences, their habits and changing needs. With an appropriate amount of data, they are effectively using data analytics to gain better insights into their customers and hence improving overall profitability.

(ii)   *Improving Operational Business Processes* – Data Analytics is offering organizations to make better operations decisions by aggregating data from different sources, applying time series and statistical analysis to gain deep insights into company's weak areas and strength zones. Banking and Financial companies are making use of analytics to track fraudulent transactions. Platform analytics in manufacturing industries and power plants is helping in preventive maintenance by forecasting the possible downtimes and thereby ensuring a preventive measure beforehand.

(iii)   *Exponential Growth in the Amount of Data* – With each passing year and increased usage of social media and internet connectivity, businesses across the globe will continue to generate humongous volumes of data. Soon businesses will be going to shift from traditional SQL data analysis to more sophisticated advanced models like Spark.

Overall Organizations would be making use of data analytics to improve the customer experience and build big data into their offerings. Companies will be gaining more market share and improved customer intelligence thereby helping them in streamlining their business operations.
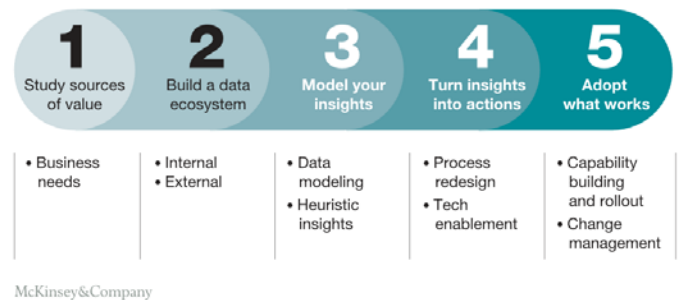

Figure 3: Data Analytic Enlightenment Approach (Source: *McKinsey & Company*)

Key Data Analytics Models Used By Businesses for Maximizing Efficiency and Profitability:

(i)   *Customer Segmentation Models* – These models are being used by businesses to design marketing strategies and tactics based on the group behavior of customers like understanding their similar characteristics, identifying buying behaviors, uncovering new insights etc.

(ii)   *Predictive Risk Models* – Highly used by Banking and Financial Services in order to identify and mitigate potential business risks resulting from fraudulent activities.

(iii)   *Quality Assurance Models* – With the Implementation of Quality assurance models, risk towards defective materials in production and manufacturing industries could be highly mitigated. It enables organizations to track defects by making use of historical data, solve

problems in production units and avoid headaches while delivering solutions to esteemed business customers.

(iv)   *Predictive Maintenance Models* – These models are acting as a key element in aligning or streamlining the business operations by utilizing time-series analysis in order to determine the future unpredictable breakdowns thereby helping organizations to calculate and improve maintenance planning which in turns will lower down the operational costs during critical downtimes.

(v)   *Sentiment Analysis Models* – Also referred to as "Option-mining" models that try to analyze and determine sentiments towards an organization and its products and services by identifying, extracting and categorizing information available from the public information portals like social media, blog reviews, e-commerce website product reviews etc By gaining insights into the positive and negative feedback or opinions businesses are acting rapidly in adopting new strategies to counter these negative opinions and enhance positivity towards their business products and service offerings.

IV.   CHALLENGES FACING DATA ANALYTICS: HOW BUSINESSES CAN OVERCOME?

There's no doubt that successful implementation of Data Analytics is helping companies and organizations towards a better, smarter and productive decision making and it is rightly said that without data analytics businesses may go blind and deaf if they don't realize the potential benefits of utilizing Data Analytics. Despite the benefits and proven results are shown by Data Analytics, businesses are still finding lots of building blocks and challenges in front of them in the implementation of Data Analytics. The challenges are appearing in the form of issues with data storage, privacy, and cost of implementation, lack of necessary skills within the organization and much more. The challenges can be categorized across five major verticals as shown below.
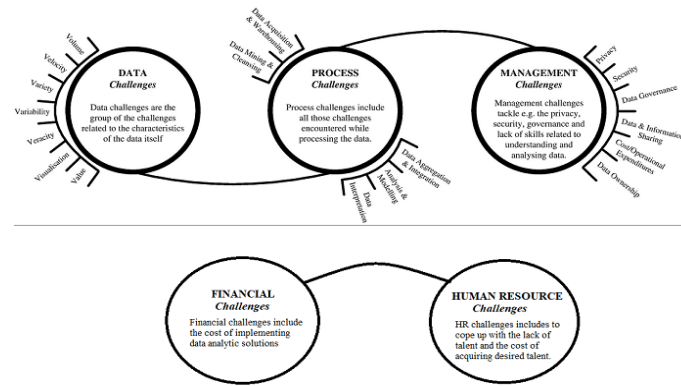

Figure 4: Challenges Facing Data Analytics Implementation (Source: *Author and Critical analysis of Big Data challenges and analytical methods (Journal of Business Research 2017)*)

(i)   Data Challenges

The key to Data Analytics is the analysis of data where data is its foremost an integral component. We are growing so fast and with companies showing a rapid increase in expanding their businesses, they are producing lots of data. As per research stats, it is estimated that we are producing around 2.5 quintillion bytes of data every day and as we keep on progressing this figure is set to increment only. Therefore the first challenge that businesses face is in the form of data where data storage and its quality come from prime importance. Gathering data from various sources and storing massive quantities of unstructured data in its raw form poses a big threat for organizations where inconsistency could lead to data duplicates, inconsistency, logical conflicts and even data loss in worst scenarios. In simple terms, Data challenges refer to challenges ranging from data volume, variety, velocity, veracity, volatility, quality, discovery, and dogmatism.

(ii)   Financial Challenges

Data Analytics comes with substantial benefits and profitability in longer run but initially, it is very important to look at the ROI factor while implementing Data Analytics. The cost of implementation of Data Analytics is very huge and a majority of the cost lies in the software expense i.e. while building an analytical database. For implementing data analytics solutions businesses need to have data storage facility, robust servers, network connectivity and monitoring tools. To implementing analytics solutions over 3TB of monthly data, companies need to spend roughly over $150,000 per month. Therefore getting analytical building solutions for new startups is a real challenge unless they have a strong funding source and that's why many developing countries are lacking behind in Analytics.

(iii) Process Challenges

Process Challenges basically refers to the challenges faced during Data Acquisition and warehousing, Data mining and cleansing, its interpretation and analysis. It describes the issues faced like how to collect the data, what transformation needs to

be applied to the data, what model fits best over the data for driving results.

(iv) Human Resource Challenges

Lack of talent is another big challenge that Data Analytics industry is facing and according to a report from McKinsey Global institute it is highly anticipated that there will be a shortage of around 1.7 million capable big data professionals. The amount by which the analytics industry is growing, the more it is widening the skill set gap. Therefore outsourcing appropriate talent in the Data Analytics industry has become a major challenge for the organizations.

(v) Management Challenges

The last but not the least challenge is encountered is in the form of management which deals with the compliances, data governance, privacy issues, security, data ownership and running the entire business operations. With the increasing peer to peer competition and latest advancements in technology, it is up to the management to decide which technology works out best for them without introducing any potentials risks and problems.
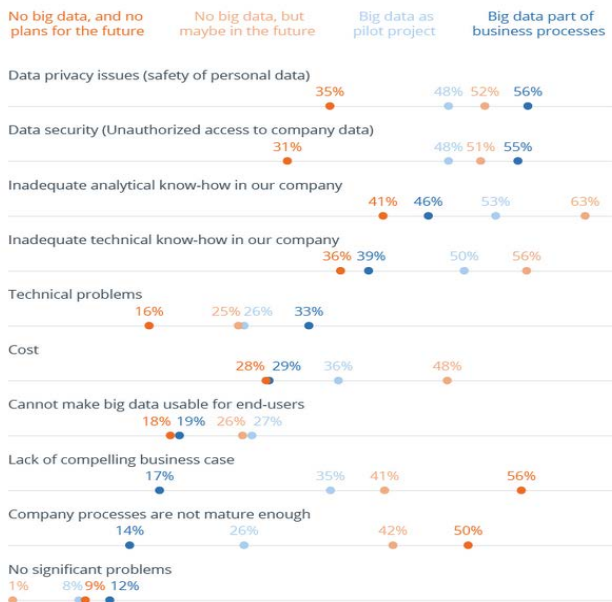

Figure 5: Challenges By Degree of Big Data Adoption   (Source: https://bi-survey.com)

As the challenges look quite big and are on the rise over the time, it is important to address them effectively and that too at the earliest because everyone knows how data analytics could turn up the fortunes of a company. Though the challenge of cost remains a major issue and that could be overcome only once the technology gets widespread across the globe with additional support from the governing bodies of that particular country. While speaking about the lack of talent, various online portals and additional courses are being impacted by all the major universities across the world enabling the new students and existing employees to enhance their skill sets in the field of business and data analytics. It is expected that with time the gap between the corporate demand and desired talent would come down.

V. CONCLUSION

The amount of data that is being generated these days has taken the world by storm and there are no signs slowing it down, come 2020 and it is expected that every individual across the world will be creating around 7 MBs of data every second. Big Data is going to open big opportunities for the businesses to act and respond to. With the fast changing world, rapidly revolving innovations and challenging business situations, organizations are searching for alternatives to expanding their revenues while cutting down on their existing expenses, that's where the field of data analytics comes in handy. For data analytics, the future will be a long evolutionary process wherein businesses that will invest in analytics and show faith in the outcome from advanced analytics will slowly gain an advantage ahead in terms of outsized financial performance, subsuming those who remain tied to traditional intuition-based, middle-manager driven decision making processes. The race of advanced analytics has already begun in terms of the powerful 'tech giants' having shown the outsized benefits of investing in and driving decisions through advanced analytics. Organizations across the world are demanding much more from their data analytics solutions, requiring immediate data insights that could help them drive business decisions and explore new areas of growth. Hot technologies like Machine learning, Artificial Intelligence, Deep learning, Big Data and Natural language processing are working in collaboration with advanced analytics reshaping the current business models.

According to IDC analysts, *"Total revenues from big data and business analytics will rise from $122 billion in 2015 to $187 billion in 2019."* And more developers will be in the line of joining the Big Data Revolution. Considering the statistical reports and high adoption rate of advanced data analytics by businesses, data analytics definitely holds a promising future. But that's on only one side of the story, in order to reap the full potential benefits of data analytics, it is imperative that organizations sort out ways to tackle some of the key challenges ahead in front of them like Data Privacy, bridging the skill set gap, a high cost of implementation etc. Certainly, the benefits coming out from data analytics is definitely worth giving a try despite the challenges that the industry owns, which for sure will come down with time as analytics spread its presence worldwide.

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