



Big Data Business Landscape In The Age Of Infonomics

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Abstract

'Big Data', the most recent and crucial buzzword has convinced all economic sectors about its imminent infusion sooner or later. The big data applications have an innate capability to metamorphose the conventionally driven businesses into a rejuvenated experiential process through value creation for the organization and the end user. The disruptive technology opens up exponential opportunities for industrial players. The imbalance, of course, exists among countries at variable stages of technological adoption. This research paper aims to highlight the major benefits that the business organizations can strive to achieve by implementing adequate big data based applications. The major gains include improved understanding of customer, optimized operations, penetrative market intelligence, agility in logistics and supply chain systems, innovation governed by data, and intelligent customer recognition, guidance and retention. The challenges for these industries are also recognized. The paper analyzes major industries which have already implemented the disruptive technological solutions or are progressing towards it. The revolution has begun and every business fights its battle for survival in the technology governed era.

Introduction

Geoffrey Moore, the celebrated author, stated in 2012, "Without big data analytics, companies are blind and deaf, wandering out onto the web like deer on a freeway."

This has become the reality of today, though it may have been considered an overstatement then. The big data has found universal acceptance across the business and administrative verticals as an indispensable tool. Google trends show the rising interest in Big Data since 2012. Data can be equated with the 'crude oil' of a digital economic setup. Lightening speed of digitization has increased the reliance on data. In Big Data, the volume, speed and variety of data is humongous and exceeds the capacity of traditional data.

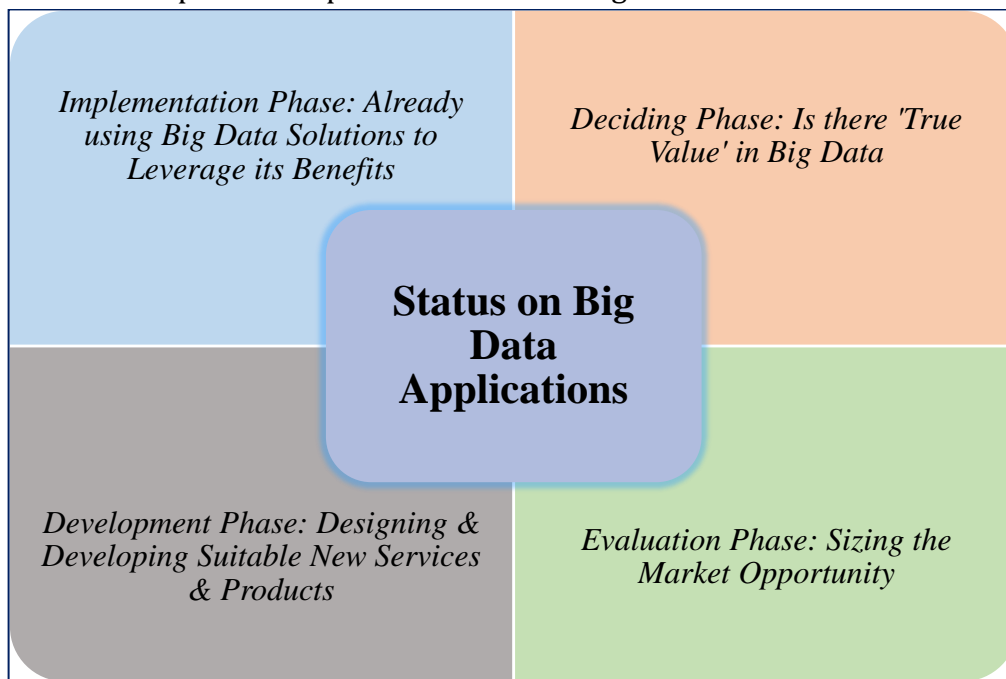
Globally, the big data market is projected to value at approximately USD 268.4 by the year

2026. The disruptive system enables vast data to be collected, filtered, and analyzed in a matter of split seconds for highly intelligent and informed decision making. In line with the rest of the world, India has also started its much awaited journey towards business growth through implementing big data analytics. According to the industry experts, the Indian big data analytics is estimated to grow almost eight times from USD 2 billion to USD 16 billion by 2025, thereby, registering a compound annual growth rate of 26 percent. The estimated Indian share in the big data enabled global market will be 32 percent by 2025. Presently among the top 10 markets for big data analytics, the NASSCOM see India ascending as among the top three markets in few years. The year 2017 was a milestone year as it ushered in the big data era in India.

The future holds great promise for the world and India, in particular. With the digital think tank amply available in the Indian organizations, the journey is going to be rewarding once the challenges and gaps are addressed.

There is variability in the readiness of organizations for using the disruptive big data technology. The organizational positions can be explained through the figure below:

Figure 1: How Companies are placed with Use of Big Data?



Sources of Big Data for Business Organizations

There are multiple sources of big data for the business organizations. The prominent sources include the different social media handles. The social media has penetrated the lives of potential customers across the social strata. The consumer psyche can be gauged by this exposure. Then there is the vast data captured by sensors during digital interfaces. The data is useful to chalk out the spending patterns, preferences and consumption mindset in

fraction of seconds for optimal business decision making. The website logs also gather enough data for deciphering the mindset of customers through the internet surfing trends. One of the most direct methods of big data collection is through the feedback from the customers and other stakeholders.

Challenges of Using the Big Data in Organizations

Globally, the organizations are differentially positioned in terms of understanding and compatibility with the big data based technologies. Amidst the inevitable adoption of big data applications for sustenance and competence in the market place, certain practical challenges are there for many industries. There is dire need of adequate funding and corresponding return on investment. The specialized skills needed to leverage the benefits of big data applications are still insufficient. A lot needs to be done to up-skill the existing talent pool. The cloud infrastructure needs to be aligned with the exponentially growing need of big data analytics, therefore, it is very essential to leverage cloud technology. The handling of huge amount of data is a very challenging task. The storage of such a mass poses constant challenge for the organizations.

An organization, if not aligned with the big data dynamics, fails to reap the associated benefits. The key challenges that a business organization faces are grave. The most important is data recognition, since it is very critical to target the appropriate data for business amidst the humongous volume. Only right data can fetch the desired results. There is a need for using appropriate analytical tools in order to fetch correct results. Consequent to the selection of appropriate analytical tools, can the relevant insights be provided. The trajectory progresses from data collection to data insight to targeted impact. The data needs to be converted to relevant insights which in turn provided the appropriate impact for business decision making

Multiple goals for adopting the big data projects:

The reasons are abound for the adoption of big data analytics based projects by companies. The primary motive behind the adoption is to have an enhanced and augmented customer experience at e reduces cost. The appropriate customer segments are targeted through the big data based technology which in turn increases efficiency of existing business processes. The enhanced data security is also a key benefit of the disruptive technology. The improved customer loyalty is ensured through enhanced customer engagement through brand interaction. These applications lead to optimization of performance. The pricing decisions are based on real time data where all the dimensions of the market have been considered, so, this gives a more realistic pricing band for organizations. It is possible to make better business decisions through analysis of large volumes of data and discovering hidden patterns and unknown associations. The consumer preferences can be known with more certainty which ultimately leads to the existing product improvement, increased revenue per

customer and customer retention. The brand awareness can be enhanced by adequate use of big data based applications.

Industries with Big Data Applications

Banking, Finance and Securities:

This critical sector stands to be one of the highest gainers by employing the big data analytics. Being the life blood of any economy, financial sector pervades all activities. The important applications include tracing activities in financial market to stop felonious trading activities. The next best use is the trade related analytics to streamline high-frequency trading, pre-trade decision-support analytics, sentiment measurement, and predictive analytics. The risk management has been revolutionized by big data techniques as it helps in the mitigation of risk, reduction of fraudulent transactions, instances of money laundering and tax evasions through risk analytics techniques. The enterprise risk management through 'Know Your customer' (KYC), initially limited to large financial institutions only, is now available to all sizes of businesses owing to cloud computing and big data

Media, Entertainment and Communications:

This new age sector is influenced by the big data technology adaptation, the most. The inherent nature of the sector resonates with the disruptive technology and multiplies the benefits for the company and the end user customer. Big Data technologies are oriented towards finding techniques to efficaciously absorb large and fast-moving data into daily business of firms. The digital customer wants to have content 'anywhere' and 'anytime', hence these companies are using novel business models for creating, pitching and disseminating their content. The launch of online TV shows, OTT platforms, online music on demand in combination with the social media channels are the manifestations of the new age digital content consumption and monetization. Big data allows companies to know the customer thoroughly and customize the content based on their interests, appropriately pricing the subscriptions, and show pitch relevant commercials. Many big organizations like Google, Yahoo, eBay, Face book and twitter have used big data since the inception of their business. The revenue streams are increasing due to the viewership pattern analysis with the help of big data techniques. It enables the organizations in this sector to simultaneously analyze the customer data and the behavioral data to generate the detailed customer profiles for various purposes. Live streaming, pay-per-view and viewership based on subscription has metamorphosed this industry. Audience interest prediction is possible with big data applications helping companies understand the association between customer and the viewing preferences, style and schedule. Content customization is possible for target audience based on the consumer insights from a large number of sources. This enables the companies to recommend and provide content on demand. It is now plausible to integrate different data sources like print, digital, social media handles, streaming videos, application

data, podcasts, individual or in-person events etc. into a unified data platform and detect digital customer behavior patterns. Content performance measurement actually facilitates new customer acquisition. Big data techniques make it possible to appreciate the reasons of membership or subscription cancellation by customers. Thus, the companies are able to minimize the audience churn and sustain the existing ones. Detailed sentiment analysis for users of different platforms like TV, mobiles, web-users in real time is made possible by the big data applications. Advertisements, the major revenue stream for media companies come out highly expensive if fail to hit the targeted audience. Big data companies can feature highly – targeted advertisements to upgrade the advertising strategy. The disruptive technology of big data analytics has unfurled associations and interconnections among the business variables which supposedly never existed. The market and options are served at the doorstep of the end user consumer through big data analytics, which can lead to increased retail transactions and consequent monetizing of digital content. The companies, aided by the big data analytics are empowered to foretell the success ratio of content much in advance. The digital strategy can thus be formulated accordingly. The big data aptly guesses the potentially popular content and other offerings before the audience comes to know about. This is a paradigm shift in the way new digital products are developed for the targeted audience with predicted success ratio

Healthcare & Wellness

This is an important sector where there is humongous data. There is a vast untapped potential in this area because the system lacks the mechanism to deliver improved healthcare to all and thereby deter the rising prices of critical medical help. The concept of holistic health is sweeping the society and the time is ripe where the big data application enabled techniques can be used by organizations to reach out with preventive and curative measures. The data is growing rampantly and it is possible to fetch data from mobile based application and other wearable devices. Such data from billions of patients make it possible for doctors to administer evidence-based medicine instead of prescribing plethora of tests which may be costly and ineffective. Big data applications can be used to collate freely available public health data and Google maps to provide visual data for rapid diagnosis and treatment. The pandemics can be best managed through efficient tracking of its spread, timely prediction of initial and successive outbreaks, containment strategy, and customized medicine based on the patient history and suitable rehabilitative measures. The combination of geographical data along with healthcare data can be efficiently used to save the vulnerable sections of people in timely manner. The health risks can be foretold with the help of big data analytics and treatment path determined in much less time as compared to the traditional mechanism. Government organizations in partnership with private players can extend the basic and advanced healthcare service across the population segments. Remote medicine and healthcare services can be better managed and appreciated using big data analytics.

Education

Big data analytics can be used significantly throughout the education spectrum. The recent advent of e-learning solutions and educational technology initiatives has paved the way for augmented learning environment for all. The learning management systems, with the help of big data techniques can precisely monitor the learning outcomes of individual student and provide timely check and guidance. The overall progress can be monitored on real time basis. The virtual classrooms can be leveraged for augmented learning at all levels. The performance of teachers can be aligned and refined according to the population demographics, aspirations, and behavioral patterns. The appropriate learning modules can be designed using big data analytics for the students deviating from the online certification courses, especially technical courses. By analyzing the click patterns, the attention span or boredom of the students is analyzed

Manufacturing, Supply Chain and Natural Resources

The ever-rising demand for natural resources has given the massive boost to the volume, complexity and velocity of data. In manufacturing industry, large data remains untapped. Big data analytics allow blending and collation of huge amounts of geospatial, graphical, temporal and textual data related to availability of natural mineral reservoirs, their characteristics, distribution, and seismic interpretation. Big data offers the potential to resolve management issues related to natural resources and manufacturing challenges to gain a cutting edge advantage. The analytical applications in natural resources and manufacturing allow for predictive modeling to support decision making. The supply chain capabilities from big data analytics hold great potential for future use. The sophisticated forecasting tools allow precise solutions to supply chain and manufacturing gaps. Predictive manufacturing can help increase production efficiency by reducing the downtime of machines. Product quality can be enhanced using big data analytics since faults can be minimized through timely tracking process. The planning for supply chain through integrating information related to output prediction, increased energy efficiency, testing and simulation of novel manufacturing processes, and customization of manufacturing process on large scale can be achieved by using big data analytics. In the manufacturing sector, big data analytics has ushered in the fourth industrial revolution or Industry 4.0. The automatic transmission and data measurement or 'telemetry' data. is used for predictive equipment maintenance, removing bottlenecks for increased production, and demand forecasting. The organizations are able to model their businesses efficiently by monitoring daily operations through integration of data across multiple sources like ERP, CRM, and Salesforce etc. The generated reports can be shared with vendors and suppliers to fine tune the complete chain. The consumer of today is exposed to plethora of products & services, and choices therein. The consumer goods producing organizations can leverage big data analytics to monitor the wavering consumer behavior by answering 'what-if scenarios'. The marketing and advertising expenses can be streamlined by matching the product or service features against

the consumer experience. The inventory levels can be better monitored bringing sharp decline in funds locked for contingency demand. The big data analytics makes it possible to integrate the demand-production-warehousing-logistics continuum and add value to the organization. It is realizable using the big data applications to synchronize the inventory and replenishment systems to avoid any stock-out scenarios in business organizations. The analytics models are equipped to model on historical and real time data along with the essential macroeconomic factors, industry trends and competitor's data. The big data can be used for procurement simplification and restructuring encouraging sizeable savings. The supply chain analytics can be utilized to track performance of contractors and conformance in real time. This makes timely interventions possible along with cost reduction.

Insurance

The insurance sector is plagued by dearth of customized services, pricing, and targeted services to new market segments. Besides this, a lot of data gathered is underutilized due to lack of insight. The big data applications can transform the insurance sector by providing customer centric insights through data extracted from social media handles, GPS enabled devices, wearable gadgets, tracking point of purchases, and CCTV footage. This leads to proper analysis and prediction of customer behavior resulting in targeted, customized, transparent and simpler products. This will go far in retaining the volatile customer base in this sector. The technology helps detect fraud and reduce chances of default by performing predictive analysis at an early stage of underwriting by scanning vast repository of data. The crucial process of claim management becomes smooth with predictive analytics from big data. The humongous database available can be monitored, analyzed and cross verified in real time to speed up the claim settlement cycle.

Retail and Wholesale Trade

The repository of data is growing every moment in the present e-commerce era, unlike the traditional format of physical system of selling. The data is gathered from customer loyalty cards, scanning points of sale (POS), Radio Frequency Identification Tags, store inventory, demographics and others. These are still not being used effectively and progress of implementation has been slow. The big data analytics can be used for scanning shopping or consumption patterns, participating in local events etc. and help retail organizations do optimized staffing. This also helps in reducing fraud and timely analysis of inventory for adequate demand management. The social media is a strong source of customer profiling and is used for customer prospecting, retaining customers, product promotion and more. The big data analytics has ushered in an era of cashier free and check out free stores to save on operating expenses and enhancing efficiency. The leading retail players have started robotizing and automating the store outlets for enhanced consumer experience. The artificial Intelligence empowered Chat-bots are either already employed or in pipeline by the leading players. These offer an improved, improvised, transparent and efficient customer service

during and post purchase. The big data analytics help retail businesses competitively price their offerings to gain an edge over other players. The transactional details, promotional details, sales figures etc. are collated to work out the actual cost of the product. The price forecasting can increase new customer base and retain the older ones. The concept of virtual trial rooms have made a huge difference in the customer expectations and shopping experience. The technology is safe, less messy and time saving, simultaneously satisfying the customer with dream outfit properly matched and accessorized. The pandemic like situation can be properly tackled through this technology. The layout of the retail store can be optimized by checking and synchronizing the product categorization to guide customers looking after a particular product. The customer saves on time and avoids messing with unwanted products on display. The product wise footfall is used for customer retention and inventory management. The big data analytics streamlines the feedback from customers and translates it into targeted promotional offers, customer satisfaction insights, purchase behavior prediction and customer retention strategies. Thus, the big data analytics goes a long way in keeping the customer details updated with a check on overall customer satisfaction with every visit to the online-offline store.

Agriculture and Allied Sector

The agricultural practice is generally passed on to next generations as a heritage. The difficulties of today's era like climate change, rapid urbanization, decreasing fertile farmland available for cultivation, and migration of youth from agricultural setups have created urgency and complications. The United Nations predicts a population of 9.8 billion by 2050. It is a tough task to feed such large number of people, hence an urgent need to step up crop production and optimizing existing resources. The technological assistance from internet of things, big data analytics and cloud computing big data and agricultural technology can come to rescue in this field. The real time data directly from ground is collected using IoT devices through sensors. The data collected in the first phase is then integrated with cloud information related to weather data and pricing models to determine patterns. The collated data help in controlling problem by isolating the pints of concern related to operational inefficiencies, soil quality, weather anomalies, demand forecasting, weed problem solution, warehousing and logistics support. There is a huge potential of analytics in agricultural domain and the market size is expected to increase exponentially. Feeding a rapidly rising population is a major concern which the big data analytics will potentially cater to. Besides, the disruptive technology is useful for providing rainfall patterns, water cycle, optimum utilization of fertilizers, pesticides etc. the types of crops to sow, the appropriate time for harvest for increased profitability. The farm machinery can be used optimally by using the big data analytics with appropriate planning for availability, servicing, fuelling requirements, optimal daily and long term usage. The big data applications can benefit an average farmer in micromanaging the farmland and associated processes for augmented earning.

Conclusion

The big data applications have ushered in a paradigm shift in the business scenario worldwide, though the scale of adoption and integration in business processes is differential. The bird's eye view of industrial adoption has shown a promising growth in revenue and value addition for both organization and customers. The data from multiple platforms is being used to uncover hidden or masked patterns, unexplored associations, market style, consumer choices, and other valuable business information. There is an enormous spending on the acquisition of big data based applications. The organizations benefitting from big data analytics need to do cost-benefit analysis and understand the industry specific challenges. It is very important to be thorough with the characteristics of data pertaining to each industry. There is also a need to acknowledge the corresponding spending pattern in each industry. This has to be followed by matching the market requirements with innate competence and related solutions. The main emphasis to harness the enormous potential of big data applications, increase efficiency and effectiveness should be to gain an expertise in industry vertical.

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