Role of Analytics in Acceptance and Implementation of E Commerce in Healthcare Organizations: A Literature Review

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ABSTRACT

Data analytics is the science of analyzing raw data to make conclusions about that information. Data analytics is important because it helps businesses optimize their performances. Many of the techniques and processes of data analytics have been automated into mechanical processes and algorithms that work over raw data for human consumption. Big data is a field that treats ways to analyse, systematically extract information from, or otherwise deal with data sets that are too large or complex to be dealt with by traditional data-processing application software. Analytics can improve the patient-based service, to detect spreading diseases earlier, generate new insights into disease mechanisms, monitor the quality of the medical and healthcare institutions as well as provide better treatment methods. Purpose: The main objective of the present study is to understand the influence of Analytics in Acceptance and Implementation of E-Commerce in Healthcare Organizations. Big data analytics in E-commerce and tried to find out how E commerce in healthcare supply chain can help to standardize healthcare data, how standardization of data can help to use Big Data Analytics in healthcare segment to replicate the benefits achieved by other segment of industry and vice versa. Methodology:- Present study is based on secondary data which has been collected from Journals, E-journals, books and other publications. Findings: Analytics helps healthcare service providers to track and manage healthcare more effectively, helps to improve patient care more efficiently, and helps to deliver more precisely in personalized manner. Every decision will be taken under real time scenario accessing big data and analysis. Executives have understood the importance of big data and analytics tool. They under stood the importance of quantitative analytics and how these tool can give them edge over the other in achieving their goals of ROI, response time, providing real time access to their customers, better costing, quick service, better quality of service, involved service and many more.

Key Word: Data Analytics, Algorithms, Health care, Medical, Health Industry

INTRODUCTION

Dynamic life style change and aging population is emphasizing tremendous pressure on Healthcare Service Providers around the world. Aging population pose increasing demand for hospital emergency services and putting cost and quality service are pressure on healthcare system and country GDP. Because of advancement in technology and option availability, healthcare industry is under tremendous pressure to improve treatment quality and cost managing their revenue and overall satisfaction among patient. Big data analytics have tremendous possibilities and potential to revamp healthcare sector in almost every segment. Real time decision making can help the decision maker assignment more quick and realistic with assured results.

Traditional logistics in healthcare, poor spending on IT, non-standard nomenclature, poor data sharing at domain expert level, introvert approach towards new concepts and technologies lags healthcare organization are to take mileage out of Big Data Analytics. Nonstandard nomenclature generates heterogeneous data in healthcare organization. Data generated within and outside healthcare organization is non uniform. Huge non uniform data is being generated by healthcare organization. Every organization has their own nomenclature. Even in some cases, data generated within the organization or in their branches is not uniform. Huge patient data is generated in healthcare organization which can be used to reduce healthcare cost and improve healthcare services. Every individual patient generates up to 4 terabyte data (e.g., a 3D CAT scan generally take 1GB, single human genome takes about 3 GB data and MRI and PET CT takes even more data). By 2020, up to 73.5

zettabytes data will be produced, which was 2.52 zettabytes in 2010, an exponential growth of 4300 percent in data generation is expected. E-Commerce in healthcare can help healthcare organization to generate standardized data. Adopting e-commerce in healthcare will help internal and external healthcare associates to work under real time scenario improving their trust level, involvement, association and ownership working towards the same goal. This intern help healthcare organization to deliver better, accountable, affordable, acceptable and cost effective healthcare services to patients taking mileage of big data analysis using their homogeneous data. E commerce in healthcare organization will help healthcare organization to generate quality homogeneous data which intern will help healthcare organization to analysis big data. Big data analytics is outcome of two technical evaluations, first big data and second analytics which includes predictive analytics, data mining, Statistics, Neural Network, artificial intelligence and many more. Cortada et al. 2012, is of the view that fact based decision making in healthcare planning, management, measurement and learning can be achieved using healthcare Analytics. Healthcare Analytics means fact based decision making understanding business insight using big data applying analytics, e.g. statistical, contextual, quantitative, predictive, cognitive and other model. Big data and Analytics give critical insight to management, executives and managers and help them to take decision under real time scenario to achieve organizational goal and competitive advantages. Analytics fulfil every one requirement in the organization providing analytics information subject to their domain requirement to take fact based decision. March 2015, emphasized that big data analysis not only improves profits and cut down waste. It has ability to predict epidemics, cure diseases, improve healthcare services, improves quality of life and reduces preventable death. Winters- Miner. 2014, believed that predictive analysis is next revolution both in Statistics and Medicines.

OBJECTIVE OF THE STUDY

The main objective of the present study is to understand the influence of Analytics in Acceptance and Implementation of E-Commerce in Healthcare Organizations. Columbus. 2014, is of the view that Big Data Analytics improved the growth of 56% firms in United States (USA) to 10% or more. Kiron et al. 2014 is of the view that this growth encouraged 91% of Fortune 1000 companies of USA to invest in Big Data Project. Riggins 1999, is of the view that e commerce helps organizations to take this dynamic advantage analyzing Big data (e.g., real-time customer service, dynamic pricing, personalized offers or improved interaction). Analytics of healthcare data allow domain expert and other professional to work and take decision under real time scenario. Ease of operation and taking all present and future decision under real time scenario helps the acceptance and implementation of E –Commerce in Healthcare organizations. Use of Analytics helps the top management, domain expert and professionals to understand the tangible and intangible benefits of E- Commerce in healthcare organizations. E-commerce in healthcare helps to get these dynamic advantages of Big Data Analysis by standardization of healthcare data which is one of the basic requirements of big data analysis. Healthcare organizations are generating big data but of no use. Poor quality heterogeneous generated in healthcare world is of no use. Self-explanatory homogeneous data that have the capability to speak and hand shake with in the healthcare segment is the need of the hour. There is big scientific saying that "garbage in garbage out", standardization of healthcare data is the need of hour to get mileage out of Big Data Analytics, which is possible by the implementation of e commerce in healthcare segment. E-Commerce can help the organization to integrate their internal and external operations helps to generate quality homogeneous data.

RESEARCH METHODOLOGY

Present study is based on secondary data which has been collected from Journals, E-journals, books and other publications. Literature from 2002-2017 has been studied in chronological order to understand and analyze the Role of Analytics in Acceptance and implementation of E-Commerce in Healthcare sector. Researcher has gone through literature related to Big data and analytics in healthcare, Healthcare Industry Improvement with Business Intelligence, E Commerce in Supply Chain Management, Healthcare Supply Chain Management, literature related to the use of internet and technology in supply

chain management, Big data analytics in E-commerce and tried to find out how E commerce in healthcare supply chain can help to standardize healthcare data, how standardization of data can help to use Big Data Analytics in healthcare segment to replicate the benefits achieved by other segment of industry and vice versa.

REVIEW OF LITERATURE

Devaraj et al. 2002; Williamson 1981, emphasis that e commerce firms can improve their profits improving their managerial transaction cost, time cost, market transaction cost and response time with better exploration of big data.

Rajmanohar, 2004; is of the view that big data having feature as clean, clear, complete, correct, consistent and currently is need of the hour having double digit growth and helps the organization to gather better market and competition insight.

Davenport and Harris, 2007; explains that big data analysis helps e commerce organization to explore loyal and profitable customer, pricing, customer care, quality policy, inventories and track and trace of their product and services.

Walter, 2008; emphasized that channel partner relationship, data sharing within and outside channel partners and multidirectional supply chain integration contributes to E-Commerce in supply chain management.

Bose 2009; is of the view that Big data analytics as "group of tools" used to extract, analyses interpret information to get insight of data and predict the possible outcomes of decisions.

Davenport, 2010; is of the view that Business analytics creates facts based decision making culture is the organization and considers to be high business performance tool having utility in almost every segment of the organization. Big data analytics helps every segment of the organization to take decision under real time scenario in the light of big data analytics. Quantitative analysis, predictive models and statistical tool helps the organization to get insight of the data allowing maximum mileage out of it.

Davenport, 2010; further emphasized that Big Data Analytics helps organizations to improve their decision making and problem solving under the light of Big Data and Business Analytics tools (e.g. Quantitative analysis, predictive models and statistical tool**). Gartner, 2011** defined that analysis of big data is complex because of three dimensions of big data, i.e., Variety, Velocity and Volume.

'Variety' means big data is composition of heterogeneous non-uniform data from many sources both structured and unstructured. Big data is made up of Physician's Notes, Clinical Data, Electronic Medical Records, CT, MRI and other Medical Images, Machines generated data, Machine's sensor data, Hospital Information System data, Pharmaceutical, R&D, Clinical Trial, Journal Articles, Insurance companies data, Social Media (Twitter, Blogs, Facebook, LinkedIn, healthcare communities, web pages) and other (**Raghupathi and Raghupathi 2014**).

'Velocity' refers to receiving or transmission of real time big data at very fast pace and reaching in burst than at constant rate.

'Volume' means, big data or extremely large data is generated. For example a 3D CAT scan generally take 1GB, single human genome takes about 3 GB data and MRI and PET CT takes even more data.

Gobble, 2013; is of the view that Big data analytics is next big thing in innovation.

Manyika et al., 2011 elaborated big data and business analytics as the next big thing for innovation, competition and productivity.

Ann Keller et al., 2012; opined that Big Data Analytics has revolutionized science and technology.

Cortada et al., 2012; is of the view that fact based decision making in healthcare planning, management, Measurement and learning can be achieved using healthcare Analytics. Healthcare Analytics means fact based decision making understanding business insight using big data applying analytics, e.g. statistical, contextual, quantitative, predictive, cognitive and other model.

Gantz and Reinsel., 2012; elaborated that Big data, Big Data Analytics, and the presentation of analyzed data to get insight of opportunities and problem area for decision making are three main characteristics of big data analytics that allows the creation of business value in terms of new products or services ideas and innovations.

Koirala 2012; is of the view that e-commerce firms are the early adaptor of big data analytics to remain on top of the business giving competitive edge to competition.

McAfee and Brynjolfsson, 2012; is of the opinion that Big data analytics has become big buzz for

organizations, researchers and e-commerce organizations. He is of the view that big data analytics importance is catalyzed by the fact that e- commerce companies introduced big data analytics in to their operation and decision making process experiences 5-6% higher returns than their counterparts.

McAfee and Brynjolfsson, 2012 emphasis that Big Data Analytics is the next frontier for innovation, productivity, competition and management revolution.

Miller, 2012 identified that advancement in technology resulted generation of huge patient data, average 4 terabyte data per patient. This data includes genomics – driven data and other patient's electronics and digital data (patient pathology and radiology diagnosis report, electronic health record, insurance records, pharmacy data, patient feedback and follow-up data).

Smith, et al., 2012 opined that healthcare supply chain becomes more complex and logistic process is the key driver of cost and quality of healthcare delivery. Author conducted survey of healthcare supply chain professionals to investigate efficiencies and improvement opportunities with in healthcare supply chain management and are of the view that data standardization is lacking across the healthcare supply chain. They came out with benefits and limitations of data standardization. Author further elaborated the barriers to data standards implementation (Lack of Resources, Information Technology, Supply Chain Partners, Lack of Knowledge, Low Priority, System Diversity, Universal Acceptance, Data issue, Management Buy in, Cultural Resistance) and gave relative importance of these barriers.

Strawn, 2012 identifies big data as the fourth paradigm of science.

Fulgoni, 2013 is of the view that big data analytics will give boost to short term decision making culture. He further elaborated that big data analytics gives opportunity to organization to set their goal, accordingly they will gather evidence based information, will explore possible options, get insight of possible options, accordingly decide best possible option and take action, under the presence of fact and figures review the action.

Gobble, 2013; emphasized big data as next big thing in innovation.

Jao 2013; emphasized that big data analytics further intensify its use in e commerce providing critical insight of the problem to take informed decision.

Jao 2013; further explains that big data analytics helps the e commerce organization to track and understand the buyer behaviour and allow them to design their offers and pop up to convert them repeat buyer.

Miller 2013; is of the view that big data analytics allows e commerce organization to get better insight of their data, higher conversion rate, improves decision making, improves data exploration and empower customers.

Tweney, 2013; emphasize that big data analysis improves overall customer experience.

Columbus, 2014; is of the view that 56% organization that make big data analytics part of their management process system got 10% or more growth.

George et al., 2014; is of the view that big data analytics helps organization for real time process measurement and monitoring for better quality management, logistics and order fulfilment cycle. Big data analytics helps real time diagnosis and detection of process issues, helps facility automation reducing delays and down time.

Harvard business review, 2014; emphasize that healthcare cost and quality can be improved providing accurate and fast information to all concerned. Worldwide governments and healthcare service providers are looking for economical way out to reduce healthcare burden on their GDP and patient out of pocket expense. Patients are looking non-traditional options of healthcare and treatment e.g. tele medicine, mobile healthcare, at home healthcare and treatment services, remote healthcare centre, clinics at pharmacy stores and other. By the use of smart phone application attaching any device or with the use of video conferencing people are performing blood and urine tests at home, getting their prescription sending digital photo of their wound or BP report or ECG or body rash or skin problem to remote physician. They are getting their chemotherapy done at home getting rid of costly hospitalization bills. They are getting their stitches or staples removed from clinic at nearby pharmacy store and any more. This facility is also helping physician and healthcare service providers to serve more and more patient using these high tech devices and IT and telecom arrangements. Big data, analytics, IT and internet helps to optimize cost, quality, time, frequency and comfort of healthcare service. Big data improves the possibilities of working under real time scenario exploring more possibilities of new R&D providing better patient care with more comfort and greater efficiency.

Kiron et al., 2014; elaborated that fact based real time decision making under the light of data insight

and possible options and their timely review benefits helps 91% Fortune 1000 companies to invest in Big Data Analytics projects, 85% increase to last year.

Winters- Miner, 2014 believed that predictive analysis is next revolution both in Statistics and Medicines.

Dutta and Bose, 2015 elaborated that big data improves fraud reduction, supply chain innovations and implementation of just in time recommendations.

Dutta and Bose., 2015; visualized that big data analytics give detailed insight of the business problem and developed a culture of data driven decision making.

Loebbecke and Picot, 2015; emphasis that big data analytics improves organization growth by improving productivity, customer surplus and employment growth.

Marr, 2015 emphasized that big data analysis not only improves profits and cut down waste. It has ability to predict epidemics, cure diseases, improve healthcare services, improves quality of life and reduces preventable death.

Cheng et al., 2016; is of the view that big data analytics helps organization to improve their decision making, customer relationship, risk management and operational efficiency.

FINDINGS AND CONCLUSION

The findings of the above review conclude that good quality homogeneous data which can speak and hand shake in healthcare segment is the need of the hour. To get the advantage of Big Data Analytics, good quality homogeneous data is very basic requirement. Big Data Analytics can help healthcare organization in acceptance and implementation of E Commerce and vice versa. E Commerce in Healthcare will help healthcare organization to integrate their operations to generate standardize data. Flow of uniform data in healthcare organization will help healthcare organization to get mileage of Big Data Analytics, which intern allow healthcare organizations to work under real time scenario having in-depth insight of present situation to predict future in more better and scientific manner. Big data and Analytics give critical insight to management, executives and managers and help them to take decision under real time scenario to achieve organizational goal and competitive advantages. Analytics fulfil every one requirement in the organization providing analytics information subject to their domain requirement to take fact based decision. It helps physicians, researchers, management, executives, service providers, insurance companies and other to evaluate, analyses and correlate ROI and performance analysis, disease management, patient segmentation, health plan analysis, multi resource planning, treatment outcome analysis, evidence based medicine, drug recall, track and trace of medical product, prevention of fraud and abuse, real time patient monitoring, determination of co-payment rates, prevention of claim rejection, process tracking and real time decision making and many more in more scientific and analytic way under real time scenario. To create more value in healthcare business executives are driving great push from big data by providing preventive care and many more. It helps healthcare service providers to track and manage healthcare more effectively, helps to improve patient care more efficiently, and helps to deliver more precisely in personalized manner.

EXPECTED CONTRIBUTION OF THE STUDY

Complexity and advancement in healthcare technology resulted generation of 4 terabyte data per patient which includes genomics – driven data and other patient's electronics and digital data (patient pathology and radiology diagnosis report, electronic health record, insurance records, pharmacy data, patient feedback and follow-up data). Healthcare organization has realized that Information democracy can be achieved with the help of Big Data analytics. Good quality homogeneous data can be generated with the implementation of e commerce in healthcare. Healthcare organization has realized that with the help of Big Data Analytics they can get the insight of every problem before taking any decision. Every decision will be taken under real time scenario accessing big data and analysis. Executives have understood the importance of big data and analytics tool. They under stood the importance of quantitative analytics and how these tool can give them edge over the other in achieving their goals of ROI, response time, providing real time access to their customers, better costing, quick service, better quality of service, involved service and many more. Under real time scenario you make customer, part of your decision making process and he feels involved, informed and satisfied. Healthcare organizations

have realized that Big Data Analytics helps to accept and implement E Commerce in healthcare organization which intern helps not only to improve profits and cut down waste. It has ability to predict epidemics, cure diseases, improve healthcare services, improves quality of life and reduces preventable death. Hence E commerce and Big Data Analytics in healthcare will help healthcare origination in achieving their goals of ROI, response time, providing real time access to their customers, better costing, quick service, better quality of service, involved service and many more.

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