

A STUDY ON APPLICATIONS OF DATA ANALYTICS IN NON-BUSINESS DOMAINS

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Abstract— In recent years, there is a phenomenal increase in amount of data generated as a result increased use of technology. This has provided an opportunity to generate business intelligence out of this huge data. Data analytics is one such technique that is used to analyze this data and extract useful information required for that particular domain. The use of technology is not limited to business domains, but also extended to non-business domains like education, health care etc. This paper presents an overview of usage of data analytics in the areas like education, defense, healthcare and food domain. The competition among education institutes leads to need for informed decision based on timely, consistent data. These requirements may be met by having suitable technology in place. The data warehouse and analytics may serve the purpose. In a similar way, health care service also needs updated information about the epidemics and statistics related to various types of information. Another field that can be benefitted by adapting new technologies is defense.

across globe to analyze data associated with business process, trends in the market or customer behavior. Data is extracted, categorized, stored and analyzed to support decision making.

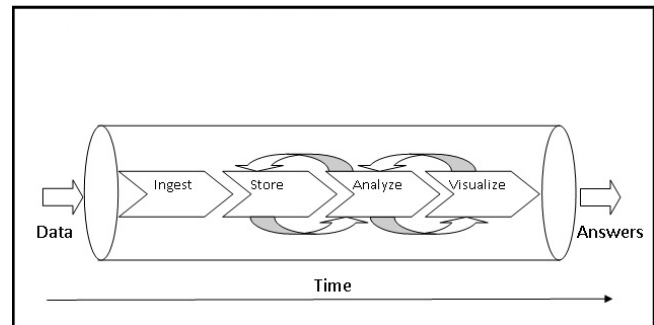


Figure (a) Data Analytics Flow

1) INTRODUCTION

In the current scenario, as per the recent studies, 2.5 exabytes (or 2.5 billion gigabytes) data is generated in a day. The data is generated in various forms like tweets, Skype calls, videos and emails. There is an opportunity to analyze this data and extract useful information from it. Data Analytics is one such practice that is being widely used. Data analytics is a process of discovering and delivering the useful information from large data set present in various forms. Data Analytics includes tasks like analysis of data, examining and transforming after cleansing the raw data. The modeling is done to discover hidden pattern in the data and finally, this helps in decision making. Data from various sources like social media, telecommunication, sensors, digital cameras, health care, scientific experiments are extracted and analyzed for hidden patterns. This data can be either structured or unstructured. Data Analytics is being used by organizations

Data that is required for generating useful information for non-profit organization comes from various sources like database relating to education, health and transportation systems. The new sources include interactions in social media, interaction with customers, data generated by GPS system, weather data and traffic data. This data can be used to analyze and generate useful information in non-business domains like intelligence transport system, military decision making, education and prediction of natural disasters. The usage of data analytics has lot of advantages. The data analytics processes have the capacity to capture, process, distribute and manage the analysis in specific form that makes it easy to get reliable information. Using health data analytics technology enables the health service providers for accurate, up-to-date and complete information about patients. The benefits also include sharing of electronic information with patients and health centers, effective diagnosis of patients, improved interaction between patient and health service providers. In education field, there is a competition among institutes for providing quality education. The decision makers of educational institutes benefit from using data analytics technology. In this paper, some of the non-business domains which can be benefitted from data analytics are discussed.

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2) DATA ANALYTICS IN NON- BUSINESS DOMAINS

A Education

The educational institute's enrolments are in running into thousands in the current scenarios. The institute's information areas include student's information, staff information, assets data, finance data and examination data [1]. The decision makers of the education institute need information from all these areas to support their decisions to improve infrastructure and facilities delivered to students. The use of Data analytics can answer their queries related to students, staff, infrastructure etc. Through implementation of data analytics, the information like students' academic and behavioral progress can be extracted and this improves the faculty visibility into the performance of the students. Data Analytics can help in extracting and analyzing the placement statistics and examination results.

Data analytics helps the educational system by providing required inputs to academic decision makers for analyzing the students capability like what they know and effective techniques to be followed in teaching learning process. Teachers can adapt to new methodologies for their teaching. Usage of data mining and data analytics techniques afford a quick response to students and teachers about their academic performance which grants a deep analysis of some educational models and extract valuable knowledge from them.

B Food Domain

The AkshayaPatra Foundation supplies the mid-day meal to over 1.6 million children across thousands of Government and Government-aided schools across the country every day. Data analytics lab of Indian Institute of Management Bangalore (IIM-B) has been used to help the NGO as it needed analytics to be cost-effective. By using the data analytics technology, the AkshayaPatra Foundation has benefited in various ways. Earlier, as informed by Vice-chairman, was using 34 routes to distribute food to government schools in Bengaluru, but, now has reduced number of routes by using the data analytics.

AkshayaPatra had used big data analytics for raising and allocating funds to planning campaigns and forecasting trends in non-profit areas. The organization used big data analytics to find a path for fundraising agencies. The result showed using of less expensive mediums such as internet and telephone has increased the funds for the foundations.

C Military Applications

Wearable electronics technology has led to generation of huge amount of data. The application areas include military. This can be used to identify the location of the fellow

soldiers, understand the geographical status of a city or a house. They can also view a video of what they'll encounter over a hill. The Next Generation of Military Wearables is a flexible hybrid electronic which is a thin and flexible device layer of printed silicon circuitry along with sensors, speakers and receivers. Patches that can be applied to wounded soldiers to track their condition, triage level, blood type, and applied medications. Also it helps in monitoring and displaying of temperature.

The data analytics comes to use in this area that enables the decision makers to understand need of the hour by analysing the data generated. The facilities can be provided without delay thus saving the life of a soldier.

D Healthcare

Motivation for building data analytics solution based on e-health originates because of reasons such as the inability of existing automation systems to provide parameter driven analysis and other factors like lack of skilled man power for handling huge data. The presence of e-health systems enables the decision makers for fast and accurate delivery of services. For Health department if the data analytics solution is available, then the following queries can be answered. "How many areas are affected due to dengue?", "Which health centres are having vaccines available for dengue ?", "How much quantity of blood are available state-wise, zone-wise ?". Decision makers benefit by proper assessment of risks and meeting immediate needs of health sector. Health data analytics driven e-health systems reduce time and distance barriers for health information flow. This helps to bring collective knowledge for effective delivery of health services.

There is a need for data analytics which involves the extrapolation of actionable insights from sources like health knowledge base and health information systems for better delivery of health services. The data warehouse can be built on health care data. Data warehouses aka OLAP (Online Analytical Processing Systems) serve knowledge workers and managers in the data analysis and decision making tasks.

Using health data analytics technology enables the health service providers for accurate, up-to-date and complete information about patients. The benefits also include sharing of electronic information with patients and health centres, effective diagnosis of patients, improved interaction between patient and health service providers.

3) CONCLUSIONS

Utilization of rapidly growing data has lot of benefits. In this paper we have listed some of the application where analytics can be used for non-business areas. To get maximum benefits, effective utilization of large data with many different available technology gives optimized results. Education field can benefit from these recent technologies in

terms effective facilities delivery to students, e-health driven by health data analytics is the other key area of concern for any governments. E-health when implemented properly reduces cost, improved quality in service delivery, bring transparency to the system and provide convenience to patients and service providers.

REFERENCES

- [1] Athanasios S. Drigas and PanagiotisLeliopoulos “The Use of Big Data in Education”, IJCSI International Journal of Computer Science Issues, Vol. 11, Issue 5, No 1, September 2014 ISSN (Print): 1694-0814 | ISSN (Online): 1694-0784
- [2] Robert Dourandish, Nina Zumel, Michael Manno “Automated Military-Civilian Information Sharing”.
- [3]. Brussels, “The Use of Big Data in Public Health Policy and Research”, 29 August 2014.
- [4]. PriyankaDhaka , Rahul JohariBig Data Application “Study and Archival of Mental Health Data, using MongoDB”, International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT) – 2016
- [5]. SanketNirale, Smitha G R, “Big Data in e-Health Service using Wearable Sensors”.
- [6]. Javier Andreu-Perez, Carmen C. Y. Poon, Robert D. Merrifield, Stephen T. C. Wong, AndGuang-Zhong Yang, “Big Data For Health”, Fellow, IEEE Journal of Biomedical And Health Informatics, Vol. 19, No. 4, July 2015
- [7]. J.Archenaa andE.A.MaryAnita,“A Survey Of Big Data Analytics in Healthcare and Government”, 2nd International Symposium on Big Data and Cloud Computing (ISBCC’15).
- [8]. SjaakWolfert, LanGe, CorVerdouw, Marc-JeroenBogaardt, “Big Data in Smart Farming – A review”.
- [9]. “Big Data in food and agriculture” Big Data & Society January-June 2016: 1–5.
- [10] <https://www.akshayapatra.org/news/increasing-efficiency-with-big-data-analytics>



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