

# Applied Big Data Analytics in Operations Management

Manish Kumar

*Indian Institute of Information Technology, Allahabad, India*

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**Chapter 1**

**Big Data in Operation Management** ..... 1

*Arushi Jain, Ambedkar Institute of Advanced Communication  
Technology and Research, India*

*Vishal Bhatnagar, Ambedkar Institute of Advanced Communication  
Technologies and Research, India*

The word big data analytics have been increased substantially these days, one of the most prominent reasons is to predict the behavior of the customer purchase. This analysis helps to understand what customer wants to purchase, where they want to go, what they want to eat etc. So that valuable insights can be converted into actions. The knowledge thus gained helps in understanding the needs of every customer individually so that it becomes easier to do the business with them. This is the revolutionary change to build a customer-centric business. To build a customer centric business an organization must be observant about what customer is doing, must keep a record about what customer is purchasing and lastly should discover the insights to maximum the profit for customer. In this chapter we discussed about various approaches to big data management and the use cases where these approaches can be applied successfully.

## Chapter 2

Application of Artificial Neural Networks in Predicting the Degradation of Tram Tracks Using Maintenance Data ..... 30

*Sara Moridpour, RMIT University, Australia*

*Ehsan Mazloumi, RMIT University, Australia*

*Reyhaneh Hesami, Yarra Trams, Australia*

The increase in number of passengers and tramcars will wear down existing rail structures faster. This is forcing the rail infrastructure asset owners to incorporate asset management strategies to reduce total operating cost of maintenance whilst improving safety and performance. Analysing track geometry defects is critical to plan a proactive maintenance strategy in short and long term. Repairing and maintaining the correctly selected tram tracks can effectively reduce the cost of maintenance operations. The main contribution of this chapter is to explore the factors influencing the degradation of tram tracks (light rail tracks) using existing geometric data, inspection data, load data and repair data. This chapter also presents an Artificial Neural Networks (ANN) model to predict the degradation of tram tracks. Predicting the degradation of tram tracks will assist in understanding the maintenance needs of tram system and reduce the operating costs of the system.

## Chapter 3

ZAMREN Big Data Management (ZAMBiDM) Envisaging Efficiency and Analytically Manage IT Resources ..... 55

*Jameson Mbale, Copperbelt University, Zambia*

The ZAMREN member institutions deal with heterogeneous teaching and research materials drawn from all walks-of-life such as industry, and NRENs world over. To deal with such huge data that is in terabits for academic and economic gain becomes a mammoth task to manipulate, process, store and analyse. It is in view of that the ZAMREN Big Data and Data Management, in this work abbreviated as ZAMBiDM, is envisaged to collectively gather relevant heterogeneous large volumes of a wide variety of data from all sectors of economy. The data would be analytically managed in storage, processing and obtaining actionable insight real-time as a way to solve high-value skilled academic and industrial business problems, in order to prepare graduates for competitive future workforce. The data would be collected from all line-ministries of Zambia such as education, agriculture, health, mining, lands, communications, commerce, including industries and NRENs worldwide and be analytically analysed to exploit strategic actions that would enhance decision making in executing relevant tasks.

## **Chapter 4**

Predictive Analytics in Operations Management..... 68

*Harsh Jain, Indian Institute of Information Technology, Allahabad,  
India*

*Amrit Pal, Indian Institute of Information Technology, Allahabad, India*

*Manish Kumar, Indian Institute of Information Technology, Allahabad,  
India*

Operations management is a field of management which emphasizes on managing the day to day operations of business organizations. These organizations possess a huge amount of data which needs to be analysed for proper functioning of business. This large amount of data keeps some useful information hidden inside it, which needs to be uncovered. This information can be retrieved using predictive analytics techniques, which predict the patterns hidden inside the data. This data is heterogeneous, processing of such huge amount of data creates challenges for the existing technologies. MapReduce is very efficient in processing this huge amount of data. In the field of operation management, data needs to be processed efficiently, so it is highly required to process data using parallel computing framework due to its large size. This chapter covers different techniques of predictive analytics based on MapReduce framework which helps in implementing the techniques on a parallel framework.

## **Chapter 5**

Pros and Cons of Applying Opinion Mining on Operation Management: A  
Big Data Perspective..... 93

*Mahima Goyal, Ambedkar Institute of Advanced Communication  
Technologies and Research, India*

*Vishal Bhatnagar, Ambedkar Institute of Advanced Communication  
Technologies and Research, India*

The web data is growing at an immense pace. This is true for the social networks also. The data in the form of opinion of an individual is gathered to find the nuggets out of the same. The development in the application of opinion mining is rapidly growing due to various social sites which prompted us to pursue exhaustive literature survey in the field of opinion mining application in operation management and to classify the existing literature in this field. In this context the authors had identified the pros and cons of applying the opinion mining on operation management from the perspective of big data. The authors had considered the amount of data involved to

be too big and for the same the big data concept is of primarily utmost significance. The authors also proposed a framework which clearly depicts the usage of the opinion mining on operation management of various domains.

## **Chapter 6**

A Conceptual Framework for Educational System Operation Management  
Synchronous with Big Data Approach..... 107

*Ganeshayya Ishwarayya Shidaganti, M. S. Ramaiah Institute of  
Technology, India*

*Prakash S, Dayanad Sagar University, India*

The philosophical interpretation of operation management in the process of delivering a 360 degree digitized educational system requires a core approach of supervision, scheming and finally controlling the mechanism of delivery the educational service and its constitutes operations. In today’s world of telecommunication, internetworking, cloud infrastructure and computational advancement, a collaborative mechanism of intelligent and reachable educational system is being conceptualized which provoke a notion of “one world one university”. The chapter aim to illustrate different source and applications of BigData Generation in educational system operations, existing mechanism to store and process these generated data, limitations of existing mechanisms and conceptualization of a novel framework. Further it aims to discuss different intelligent analytics approach to improvise the teaching-learning philosophy.

## **Chapter 7**

Management of SME’s Semi Structured Data Using Semantic Technique..... 133

*Saravjeet Singh, Chitkara University, India*

*Jaiteg Singh, Chitkara University, India*

Management of data for an organization is crucial task but when data goes to its complex form then it becomes multifaceted as well as vital. In today era most of the organizations generating semi structured or unstructured data that requires special techniques to handle and manage. With the needs to handle unstructured data, semantic web technology provides a way to come up with the effective solution. In this chapter Synthetic Semantic Data Management (SSDM) is explained that is based semantic web technique and will helps to manage data of small and Midsized Enterprise (SME). SSDM provide the procedure to handle, store, manages and retrieval of semi structured data.

## **Chapter 8**

**An Overview of Big Data Security with Hadoop Framework..... 165**

*Jaya Singh, Indian Institute of Information Technology, Allahabad,  
India*

*Ashish Maruti Gimekar, Indian Institute of Information Technology,  
Allahabad, India*

*S. Venkatesan, Indian Institute of Information Technology, Allahabad,  
India*

Big Data is a very huge volume of data which is beyond the storage capacity and processing capability of traditional system. The volume of data is increasing at exponential rate. Therefore, there is the need of such mechanism to store and process such high volume of data. The impressiveness of the Big data lies with its major applicability to almost all industries. Therefore, it represents both, the tremendous opportunities and complex challenges. Such omnipotent eminence leads to the privacy and security related challenges to the big data. Nowadays, security of big data is mainly focused by every organization because it contains a lot of sensitive data and useful information for taking decisions. The hostile nature of digital data itself has certain inherited security challenges. The aim of Big data security is to identify security issues and to find the better solution for handling security challenges. The observation and analysis of different security mechanism related to the issues of big data and their solutions are focused in this chapter.

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