Chapter 3

Big Data Utilization, Benefits, and Challenges for Smart City Implementation

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ABSTRACT

With the rapid advancement of technology, everything is transforming into smarter versions. The term smart city means a technologically strengthened and advanced version of the city. Smart cities utilize digital information and techniques for improving services like performance, quality, etc. Big data technology and methods are utilized for handling the vast volume, high velocity and wide variety of data related to cities. This chapter discusses the big data utilization for making smart cities and also throws light on various applications where efficient analysis of services can be carried out using Big Data techniques. The main objective of this chapter will be to provide knowledge of big data implementation for the smart city and its services. This chapter will also investigate various prospects, benefits, and challenges of absorbing big data utilization for smart cities. It will also discuss some case studies related to big data applications for smart city services. It will also propose some open issues related to big data implementation for the smart city.

INTRODUCTION

In the recent scenario each city is transforming into smart city by implementing various techniques and infrastructures. These technologies help in improving not only the look of city but will enhance the performance of various activities related to health, communication, education, transportation, business, utilization of resources and help citizens to sustain comfortable living. The idea behind smart city is to upgrade the standards of services provided to citizens and also regulate costs and time. The term Smart City means technologically strengthened and advanced version of city, which analyses its environment...
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using data analysis so that it can easily adapt changes and resolves problems and to advance living quality of residents. As digitization era is upgrading day by day data storage and retrieval becomes crucial tasks and in order to make city smarter and enhance its services Big Data Analytics plays a vital role (Al Nuaimi et. al, 2015). It helps in managing huge amount of data and its retrieval to various useful application areas.

SMART CITY

Smart cities utilize digital information and techniques for improving services like performance, quality etc. Smart city helps in reducing cost and consumption of resources and active engagement of residents. The main goal behind development of smart city applications is improvement of management techniques of urban flows and also allows real time data response and various challenges associated with it. Smart city helps in enhancing the process of decision-making combining Information Technology. Smart city characteristics are as follows:

- **Instrumented City**: City’s data of data sources are sensed and measured
- **Interconnected City**: Consists of physical phase and logical phase. Physical phase refers to the networks which integrates systems and also attach devices. Logical phase deals with the combination of data from various sources and also mentions relationships between data.
- **Intelligent City**: Utilizes various advance logical techniques to set perceptions for events of city and tools for visualization to envisage behavior of city.

Figure 1. Smart city concepts
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