Chapter 87
Management of Big Data Projects:
PMI Approach for Success

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ABSTRACT

Big data is an emerging area of research that is of interest to various fields; however, studies in the literature and various sources claim that failure rates for big data projects are considerably high. There are different reasons for failure; varying from management processes to the use of wrong technologies. This study investigates how the project management framework proposed by Project Management Institute (PMI) can be effectively adapted to big data projects to reduce failure rates. The application of processes as mentioned in this study can help to eliminate the causes of failure in the early stages of the project; thus, increasing the successful completion rate of such projects.

INTRODUCTION

Big data became a hot topic, attracting the extensive attention of academia, industry, and government across the world. Due to the rapid development of the Internet, the Internet of Things and Cloud Computing, data generated and stored in almost every industry and business area grow significantly in recent years. (Jin, Wah, Cheng, & Wang, 2015). Specifically, big data concept is also fundamental and prevalent in the area of Industry 4.0. Data and analytics are core capabilities of Industry 4.0 and contributing digital technologies; namely cloud computing, mobile devices, IoT platforms, Location detection technologies,

advanced human-machine interfaces, authentication and fraud detection, 3D printing, smart sensors, multilevel customer interaction and customer profiling, augmented reality and wearables (PWC, 2016).

Big Data analytics tools and techniques are rising in demand due to the use of Big Data in businesses. Organizations can find new opportunities and gain new insights to run their business efficiently. These tools help in providing meaningful information for making better business decisions (Verma, 2018). So, the number of projects which are in Big Data business increasing every year and these projects are becoming crucial for companies.

According to a Gartner report, it predicts $2.5 M per minute in IoT spending and 1 M new IoT devices will be sold every hour by 2021. It is a testament to the speed with which digital connectivity is changing the lives of people all over the world (Riddle, 2017). Because of Big Data is part of Industry 4.0, the need for processing of the data which will be generated from these devices and the number of big data projects will increase exponentially year by year.

Big data technologies provide project managers to find opportunities for making corporate decisions for creating successful projects. By analyzing the narrowed scope of data, the company can make better-informed decisions leading to higher success projects and profits. Also, data analysis leads to reducing project complexity. Having inadequate knowledge of information to make decisions is determinant to any business. Many managers must deal with uncertainty and complex problems, but if they can uncover digital material using the right tools to comprehend the project's problems, then they can reduce the intricacy of the project (McAllister, 2018).

Analysis methods that utilize big data groups in production increase the quality of production, save energy and facilitate equipment maintenance. From the perspective of Industry 4.0, collection and analysis of data from various systems such as enterprise and customer-based management systems as well as production systems, and real-time decision-making systems will become the standard in the future (TÜSİAD, 2016). Integrated systems will analyze data to predict errors, define parameters and adapt to changing conditions; thereby increasing productivity. That is why "Big Data Analytics" is one of the nine principles of Industry 4.0.

Handling big data requires additional constraints about volume, variety, velocity, and veracity. In this context;

- **Variety** refers to different types of data collected via smartphones or social media such as images, text, and audio.
- **Volume** refers to large amounts of any data from many different sources, including mobile digital data creation devices and digital devices.
- **Velocity** refers to the speed of data transfers. As mentioned in the *variety* concept, there are different forms of streamed data from multiple sources. So, new algorithms and methods are needed to process and analyze the online and streaming data adequately.
- **Veracity (Complexity)** is related to the correctness and accuracy of information. Behind any information management practice lie the core doctrines of data quality, data governance, and metadata management, along with considerations of privacy and legal concerns (Bello-Orgaz, Jung, & Camacho, 2016).

Considering the constraints above, management of big data application projects demand an understanding of additional requirements given with processing of big data, as well as working with multidisciplinary teams. Development teams focus more on the technology and architecture for processing

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