International Journal of Business Analytics
Volume 9 • Issue 1

A Patent Analysis on Big Data Projects

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ABSTRACT

Studies concerning big data patents have been published; however, research investigating big data projects is scarce. Therefore, the objective of this study was to conduct an exploratory analysis of a patent database to collect information about the characteristics of registered patents related to big data projects. The authors searched for patents related to big data projects in the Espacenet database on January 10, 2021 and identified 109 records. The textual analysis detected three word classes interpreted as (1) a direction to cloud computing, (2) optimization of solutions, and (3) storage and data sharing structures. The results also revealed emerging technologies such as blockchain and the internet of things, which are utilized in big data project solutions. This observation demonstrates the importance that has been given to solutions that facilitate decision-making in an increasingly data-driven context. As a contribution, they understand that this study endorses a group of researchers that has been dedicated to academic research on patent documents.

KEYWORDS

Big Data, Blockchain, Cloud, Intellectual Property, IoT, Patent, Project, Technology

1. INTRODUCTION

Big Data is characterized as a large data set, which is challenging to store, process, analyze, and understand using traditional database processing tools (S. Huang & Chaovalitwongse, 2015). The advancement in the use of Big Data has driven a generation of technologies and architectures designed to extract economic value through analysis (Gantz & Reinsel, 2011). Thus, decisions oriented to data analysis stand out compared to decisions based on intuition (McAfee & Brynjolfsson, 2012). With the increase in the generation of unstructured data, the analysis and interpretation through structured tables with rows and columns becomes increasingly complex.

A Big Data project, in its turn, can be defined as a data-intensive project that presents large-scale problems with restrictions of volume, variety, speed (Becker, 2017), and still veracity of the data (Barham & Daim, 2018). Therefore, the culture of data-driven decision-making is essential to the success of a Big Data project (Dutta & Bose, 2015). Big data projects, using cutting-edge analysis involving artificial intelligence and machine learning, condition computers to identify what these data represent by identifying patterns more assertively.

Decision-making based on data depends on the successful implementation of Big Data projects (Dutta & Bose, 2015). However, the excessive focus on data and the neglect of adequate decision-

DOI: 10.4018/IJBAN.288516

making has been evidenced as an aspect that reflects the failure of Big Data projects (Chiheb, Boumahdi, & Bouarfa, 2019). Big Data project characteristics reflect potential highly uncertain inputs (for example, the relevance of data) and also potentially highly uncertain results (for example, information may be inaccurately derived from data analysis) (J. Saltz, Shamshurin, & Connors, 2017). Big Data projects have also provided a good discussion regarding success factors. In a broad perspective, there is a convergence between studies that investigated success factors in big data projects and that encompass five predominant characteristics: Governance, Objectives, Processes, Data, Team, and Tools (Gao, Koronios, & Selle, 2015; J. S. Saltz & Shamshurin, 2016).

Despite the evolution made in the Big Data area in recent years, practitioners reinforce the need for research related to guides, models, or even methodologies (Lara, De Sojo, Aljawarneh, Schumaker, & Al-Shargabi, 2020). As a result, opportunities arise for project management professionals to contribute by identifying appropriate measures and types of data, helping to interpret the data, and placing them in an evaluation context (Olsson & Bull-Berg, 2015). In addition to identifying technological trends in specific fields (Abbas, Bilal, Zhang, & Khan, 2015), patent analysis can identify recurring problems in a specific area, as patent registrations are intended to solve a practical problem.

Previous patent analysis studies of Big Data technology have been performed. Examples include abstract analysis of Chinese Big Data patents (Z. Yang et al., 2017), hot classification fields of Big Data technology (Gui, Liu, Bai, & Zhang, 2017), methods technology assessment using quantitative patent analysis for technology transfer in Big Data marketing (Jun, Park, & Jang, 2015), business interests and activities around Big Data (Y. Huang et al., 2016) and an analysis of the patenting activities of global jurisdictions in the Big Data field (Saheb & Saheb, 2020). While these studies analyze Big Data patents, they do not directly address the specific area of Big Data projects.

Singh (2019) stated that Big Data projects involve research in purely technical areas, such as ubiquitous information and integration in Big Data ecosystems. Thus, given the relevance of Big Data projects and the scarcity of studies characterizing the patents generated in this area, we took this as an opportunity for new research. Herein, an exploratory analysis of the Espacenet patent database was performed on January 10, 2021. to identify and subsequently describe registered Big Data projects patents. based on an initial sample of 109 records.

Our results advance the discussion on Big Data projects since this study fills a gap in intellectual property knowledge. This study also endorses the researchers who promote patent research to search for information on solving technical problems without being limited to scientific articles. Finally, based on this study's main findings, we suggest extending this analysis from a Big Data project management perspective in the future.

In the following sections, we present the Theoretical background (Section 2), Methodological procedures (Section 3), Results and Discussion (Section 4), and Conclusions (Section 5) of this study.

2. THEORETICAL BACKGROUND

Previous studies reported an approach for organizations to create Big Data projects, encompassing phases of project planning, implementation, and post-implementation (Mousannif, Sabah, Douiji, & Sayad, 2014, 2016). Moreover, another study proposed implementing Big Data projects based on the strategic basis, data analysis, and implementation phases (Dutta & Bose, 2015). These two proposals, which aim to establish effective Big Data solutions, initially discuss the strategic aspect of the project and the attendance of business problems, reinforcing the holistic characteristic of all Big Data projects.

Interestingly, the strategic alignment of Big Data projects with the organizational vision has been considered a success factor in Big Data projects (Gao et al., 2015; J. S. Saltz & Shamshurin, 2016). Indeed, the proper use of data visualization technologies is crucial for successful data interpretation and must be considered by the decision-makers at the strategic level, such as data analysts and executives (Moore, 2017).