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Research Article

Big Data Deployment and Knowledge-Based Sharing: A Research Investigation of Their Deployment and Sustainability as Educational Goals

Dr. Karan Singh Guleria[1*], P. Swati[2], Dr. Melanie Lourens[3], Dr. Shaik Balkhis Banu[4], Dr. C. Shekhar Upadhyay[5] and Harish Satyala[6]

[1]Assistant Professor, Arni School of Law, Arni University, Kathgarh, District Kangra, Himachal Pradesh, India
[2]Assistant Professor, Information Technology, SRM Easwari Engineering College Chennai, Anna University Chennai, Chennai, Tamil Nadu, India
[3]Deputy Dean, Faculty of Management Sciences, Durban University of Technology, South Africa
[4]Assistant Professor, Department of Physiotherapy, Fatima College of Health Sciences, Al Ain, UAE
[5]Senior Assistant Professor, Jagran Lakecity Business School, Jagran Lakecity University Bhopal Madhya Pradesh, India
[6]Research Scholar; Operation Management Indian institute of Management, Ranchi, India

***Corresponding Author**
Dr. Karan Singh Guleria
(Karangulerialaw@gmail.com)

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Abstract: Big data is now a crucial force for innovation and decision-making across many industries in the age of abundant information. Big data deployment and successful use have sparked important developments, necessitating an increasing demand for educational institutions to integrate it into their curricula. With a focus on their long-term implementation in educational contexts, this research aims to explore how big data installation and based on expertise sharing may be incorporated as instructional goals. Due to its applications for enhancing industry 4.0 app performance and decision-making accuracy, big data analytics has also revolutionized the business sector. The study's direction was provided by a theoretical framework built on knowledge and a qualitative approach was used. According to the findings, adopting big data analytics requires externality, compatibility and suitable business data environment assistance. Their beneficial relationship between knowledge management practices and organizational effectiveness is examined. This study contains practical guidance for those in charge of creating the strategy for integrating analysis of big data in educational institutions establishments.

Keywords: Big Data, Knowledge-Based Sharing, Sustainability and Educational Goals

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INTRODUCTION

Harnessing the potential of big data has become a priority for corporations, governments and organizations all over the world due to the exponential growth of data in the modern digital age. The necessity to give the upcoming workforce the ability to handle big data safely and effectively grows along with the need for data-driven insights. With the advancement of the big data era, Big Data Analytics (BDA) has received adequate interest from scientists and professionals, who have realized the significant business potential big data may offer to a company. BDA is divided into 2 components: business analysis and big data [1]. The first type offers the details basis for BDA, whilst the latter relates to organizations' capability to employ data to acquire business knowledge. Several research studies have been conducted to study the process by which companies can utilize BDA to improve management processes, enhance company efficiency [2] and increase their competitive edge. In practice, businesses have adopted BDA as a valuable instrument for precise advertising, predicting customer action and managing user-generated materials.

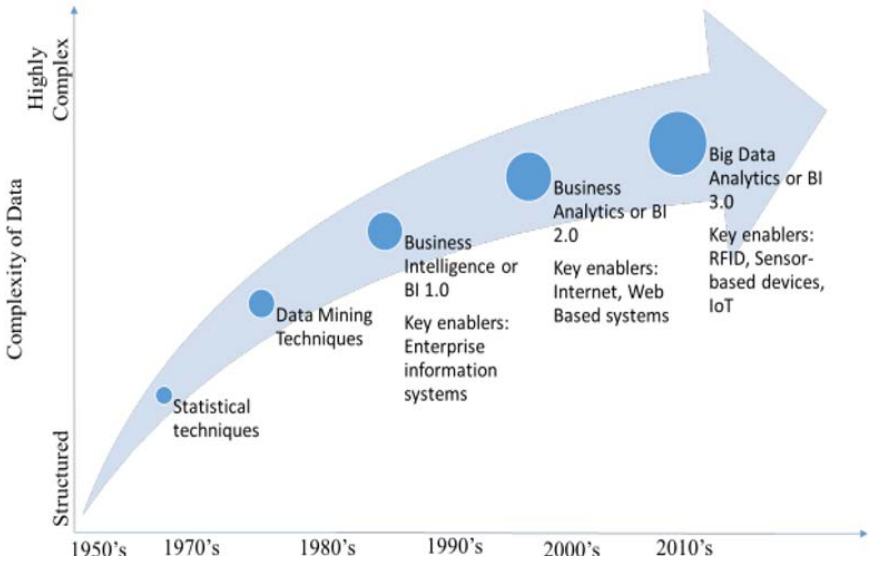


Figure 1: BDA Evaluation

In the available research, there is no apparent consensus on several big data terms. There is, nevertheless, a trend of evolution in terms of terminology and the growth of capacities appropriate for data-based choices [3]. Figure 1 depicts the progression of BDA depending on the available research. As a result, while BDA is not novel, it has grown to satisfy the evolving data processing requirements of organizations. From 1950 to 2010, the complication of data rapidly rose and as an outcome, BDA evolved as the standard innovation to address BD issues [4].

Big data deployment and knowledge-based sharing must be incorporated into educational objectives if we want to provide students with the skills they need to successfully traverse the data-driven world and make wise decisions [5]. Big data deployment is the process of efficiently utilizing and applying significant amounts of organized and unstructured data to identify significant trends, patterns and insights. Data collection, retention, processing, evaluation and visualization are just a few of the processes involved in the deployment process. Big data deployment aims to provide businesses with the information they need to make wise decisions, increase productivity, improve customer experiences and spur innovation in a variety of industries [6].

The study and implementation of big data technologies, resources and methodologies must be incorporated into the curriculum for big data deployment to be considered an educational goal. This enables students to acquire the abilities and knowledge necessary to properly handle and evaluate massive datasets [7]. By integrating big data ideas into learning, pupils become better prepared for the analytics-centric profession and can support informed choices in a range of industries.

The practice of disseminating and transferring knowledge, skills and ideas among people or organizations within a company or a community is referred to as "knowledge-based sharing." Knowledge-based sharing encourages an atmosphere of collaboration in educational settings where students and teachers can exchange experiences, expertise and best practices [8]. This strategy promotes active participation, analytical thinking and problem-solving abilities. Knowledge-based sharing promotes peer-to-peer learning, group projects and open dialogue as its main educational objectives. It allows them to capitalize on one another's advantages, gain knowledge from other viewpoints [9] and collectively deepen their grasp of difficult concepts. "Sustainability of big data deployment" refers to the successful and ongoing incorporation of these concepts into the system of instruction, which is predicated on information sharing as a method of instruction [10].

Research Objectives:

- To examine the current situation of knowledge-based exchange and big data adoption in educational institutions
- As an educational objective, recognize the difficulties and constraints preventing the integration of big data and knowledge exchange
- To investigate effective case studies and sustained implementation best practices

Literature Review

Acceptance of Big Data Deployment or Analytics (BDA): Studies show that big data seems a sizable volume of organized information that is too complicated and unorganized to handle using traditional methods. Although there is dissatisfaction about what constitutes "big data," the term was originally intended to refer to data that met certain criteria: it was generated rapidly and in large quantities; it came from a variety of publications; it provided precise data; and it was useful for causing decisions [11]; this is a description of the Big Data's 5Vs. The skill to analyze and comprehend big data results and produce descriptive, forecasting and prescriptive results has been referred to as BDA. The framework of TOE referred to as Technology, Organization and Environment, created by researchers [12] stands out among the ideas that have been put up to explain the variables that affect technological adoption, like the BDA. The TOE framework is suitable for identifying the technical, administrative and external factors that impact organizational success as it has been employed to the analysis of innovative models such as cloud computing and electronic commerce in the past [13] and BDA in sectors other than Higher education Institutions (HEIs). Although BDA is acknowledged as an innovation that has the potential to give businesses an edge, its rate of adoption has not increased as quickly as anticipated [14] and numerous studies have concentrated on the technical side of the technology. Existing research on the factors affecting big data adoption has been limited [15], notwithstanding the significance of implementing and leveraging big data advantages for security over rivals and enhancing corporate enactment.

BDA and Performance of Organizations in HEIs: An Interaction

BDA is based on the theory of resource utilization, which claims the effectiveness of a company is dependent on the degree to which it concurrently holds valued, uncommon, incorrectly comparable and properly structured assets [16]. BDA is used to improve organizational performance. According to the dependent-on-resourcesapproach, BDA is viewed as a reserve that offers competitive benefits since it is valued and possesses essential qualities that lead to superior performance within an organization.

Interactions across different abilities of BDA are essential because they enhance efficiency by offering a model that is hard for competitors to imitate. It is noteworthy that several researchers [15] have approached BDA from a resource perspective. According to earlier research, an organization's capacity for information gathering, preparation and analysis has a favorable negative effect on performance metrics like profitability or exchange of assets. If competencies for BDA are challenging developed imitation techniques can provide an organization with an advantage over rivals [17]. In the scenario of HEIs, BDA might allow data-driven making a decision that utilizes thorough analysis of the available data to enhance the performance of the business and, in the workflow, transform HEIs into value-creating driven by data companies [18]. BDA has been used by HEIs like Purdue University and Cambridge to enhance the student experience and lower dropout rates, which has improved their performance and reputation. Prior research has identified multiple uses of analysis data in education and instruction in HEIs [17]; between the different requests, the performance of students can be predicted by gathering data like as student's profile, their degree of involvement and pertinent past information based on earlier semesters. This is how BDA makes it possible to raise important academic performance measures like retention and success rates for students.

MATERIALS AND METHODS

A mixed-method strategy was used for the research investigation, combining qualitative and quantitative data collection techniques. The qualitative aspect is conducting interviews with instructors, managers and business professionals to get a deeper understanding of their viewpoints about the usage of big data in learning environments. Case studies of educational institutions that successfully used these strategies were also examined.

To assess students' understanding, views and happiness about the integration of big data and knowledge-based sharing in their educational journey, surveys were issued to professors, stakeholders and students. To draw insightful findings from the data analysis, statistical software was used.

RESULTS

The findings shed light on the challenges faced by educational institutions in implementing these goals and provided an overview of the status of big data installation and knowledge-driven sharing in the field. It showcased successful previous studies that highlight how specific academic institutions have successfully incorporated big data into their curricula and promoted student knowledge exchange.

Prior to analyzing the data, the Cronbach's alpha value is used to assess the reliability of the measures, with 0.8 serving as the lowest desired value for each construction. Cronbach's alpha for each builds alpha coefficients larger than 0.8, as indicated in Table 1, indicating a satisfactory level of dependability.

Table 1: Assessment of Reliability

Model	α coefficient	Mean
Implementation of BDA	0.884	5.894
Compatibility (CMT)	0.853	5.351
Organizational Data Environment (ODE)	0.898	5.305
Knowledge Acquisition (KWA)	0.846	5.344
Organizational Performance (ORP)	0.921	5.372

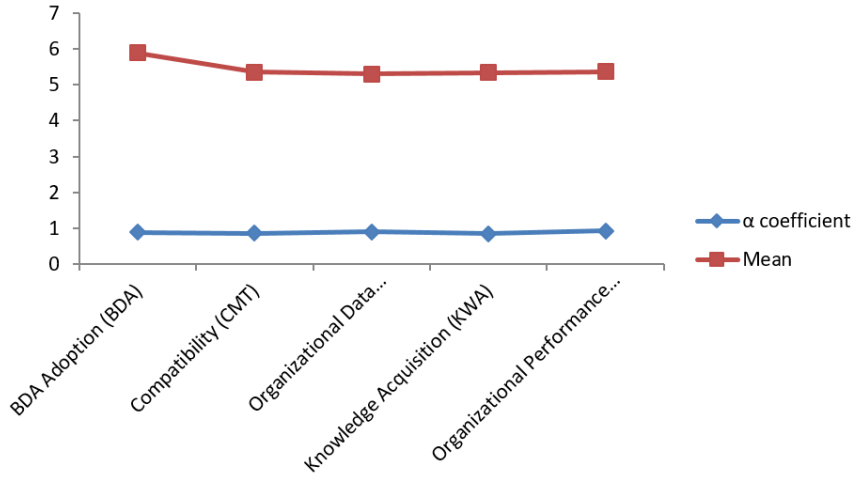


Figure 2: Reliability Analysis of Various Constructs

DISCUSSION

Big data deployment and knowledge-based sharing were examined as ramifications of the research investigation and presented with practical advice for educational institutions to sustainably embrace as educational aims. To guarantee that students are exposed to big data applications that are used in the real world, emphasis has been placed on encouraging relationships between academia and industry. The key goals of this research are to observe the current situation of knowledge-based exchange and big data adoption in educational institutions as well as to recognize the difficulties and constraints preventing the integration of big data and knowledge exchange. Contrary to the conclusions of earlier studies [17], the study's findings indicate that technological variables have little bearing on the adoption of BDAs. This might be because BDA adoption in the field in comparison to other sectors, education is nonetheless in its early phases [18] and difficulty is not yet noticed in emerging nations because it has not been used in intricate scenarios that call for the interpreting of multiple resources of knowledge. Contrary to earlier studies, compatibility has a substantial influence on the implementation of BDAs (Figure 2).

CONCLUSION

It is possible to equip a future generation of workers for success in a data-driven workplace by making knowledge-driven sharing and big data installation instructional objectives. Educational institutions may significantly advance toward sustainable integration by addressing the issues and putting in place practical methods. This will enable students to be prepared for the future and make valuable contributions to their professions. To sum up, big data deployment and knowledge-based sharing as educational objectives give students the skills they need for a future driven by data and foster collaborative learning settings. In this context, sustainability entails the integration of curricula, faculty development, resource allocation, industry engagement, sound assessment procedures and trend-responsiveness. Educational institutions may successfully prepare students for success in a data-rich and connected society by embracing these principles.

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