STRATEGIC UTILIZATION OF MANAGEMENT INFORMATION SYSTEMS FOR EFFICIENT ORGANIZATIONAL MANAGEMENT IN THE AGE OF BIG DATA

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ABSTRACT

In the era of big data, this qualitative study investigates the strategic use of management information systems (MIS) for effective organisational management. It covers the problem of MIS adaptation to Big Data's features and prospects. The study's goals include examining the MIS's changing function, examining integration tactics, and offering suggestions for efficient use. The report outlines the main issues with organisational management, such as information silos, data overload, and the requirement for quick decision-making. It makes detailed evaluations of relevant works using content analysis, demonstrating the development of MIS, its theoretical underpinnings, and the importance it bears in improving organisational effectiveness. It also examines the effects of Big Data and the difficulties in integrating it into MIS. This study makes a contribution by filling in significant research gaps about how businesses might utilize the potential of MIS in a Big Data environment. The necessity of strategic adaptability, data governance, and resource allocation for efficient MIS integration is highlighted by the findings. Strategic adaptation, solid data governance, and effective resource allocation are all recommended. The study's findings, which provide informed decision-making and innovation by strategically exploiting MIS in the age of Big Data, direct organizations towards effective and competitive organisational management practises.

KEYWORDS

Management Information Systems, Big Data, Organizational Management, Data Governance, Strategic Adaptation.

1. INTRODUCTION

The strategic use of Management Information Systems (MIS) has become essential for organizations all over the world in an era marked by an explosion of data. Modern organisational management is entering a new era of unparalleled potential and difficulties as a result of the emergence of Big Data and the rapid growth of technology. In the era of big data, this study sets out to investigate the strategic use of MIS for effective organizational management.

1.1. Background of the Study

The digital revolution has produced a plethora of data unlike any other time in history because to improvements in processing power and connection. The way that organization's function has been radically changed by this informational tsunami, often known as Big Data. Organizations have tapped into the potential of data to achieve a competitive edge through techniques including supply chain optimisation, predictive maintenance, and personalized marketing. In the past,

management information systems have been essential to organizational decision-making processes. These platforms have given CEOs rapid access to pertinent information that has helped them make decisions. However, the environment is quickly changing. Traditional MIS paradigms are being challenged by the sheer volume, velocity, and variety of data being created in the digital age.

1.2. Significance of the Study

This study's effort to close the gap between conventional MIS procedures and the requirements of the Big Data age makes it significant. Organizations all across the world are struggling to successfully manage and leverage massive databases. In this situation, knowing how to strategically use MIS becomes essential.

1.2.1. What is known about the broad topic?

Literature already in existence has clarified the significance of MIS in organisational administration. The advantages of MIS in simplifying processes, improving decision-making, and increasing general efficiency have been explored by researchers. However, the rapid advancement of technology and the introduction of Big Data present new challenges and opportunities that require further research.

1.2.2. What are the gaps or weak points that must be filled?

The literature currently lacks information on how to adapt MIS to the Big Data environment. Few thorough research have been conducted on the strategic fusion of MIS and Big Data for effective organizational management.

1.2.3. What is the significance of addressing those gaps?

It's imperative for businesses to close these gaps if they want to use Big Data effectively while preserving current management practises. Giving advice on how MIS might be modified to use Big Data for strategic decision-making is crucial.

1.3. Research Objectives

The following goals are the focus of this study:

1. To investigate how Management Information Systems are changing in the Big Data era.
2. To examine how MIS and Big Data are strategically used for effective organisational management.
3. To determine the theoretical precepts that support the efficient use of MIS in the Big Data age.

1.4. Research Questions

1. In the context of big data, how has the function of management information systems changed?
2. What are the most successful MIS and Big Data integration tactics for organisational management?
3. In the era of big data, what theoretical frameworks may be used to improve the strategic application of MIS?

1.5. The Study's Purpose

This study focus on the conceptual and theoretical foundations of the strategic use of management information systems in the Big Data era. In order to contextualize the results within a local organisational management framework, it will draw on international viewpoints and examples. Furthermore, this research won't rely on quantitative data; instead, it will present a qualitative examination of the subject, with special emphasis on conceptual exploration and synthesis of previously known information.

2. STATEMENT OF THE PROBLEM

The integration of Big Data with the function of Management Information Systems (MIS) provides a complicated combination of opportunities and problems in the contemporary environment of organisational management. The specific issues that necessitate a thorough investigation of the strategic application of MIS for effective organisational management in the Big Data era are outlined in this section.

2.1. Organizational Management Challenges

Organizations nowadays face a range of challenges while using management strategies. These difficulties include:

1. Data Overload: Organizations are now dealing with an excessive volume of information as a result of the expansion of Big Data sources, making it challenging to derive useful insights.
2. Information Silos: Disparate data sources frequently cause information silos inside organizations, impeding efficient departmental communication and decision-making.
3. Real-period Decision-Making: In a period of quick change, organizations find it difficult to make choices in real-time since conventional MIS may not have the flexibility to process and analyse data quickly.
4. Cybersecurity Concerns: Organizations are more vulnerable to cybersecurity attacks as a result of their growing reliance on digital technologies, which calls for effective data protection measures.

2.2. Role of Management Information Systems (MIS)

By delivering timely and pertinent information, MIS has always played a key role in assisting organisational management. Big Data's difficulties, nevertheless, have made it unclear if conventional MIS can still meet the demands of modern management. The problems encompass:

1. Big Data adaptation: Current MIS frameworks might not be able to handle the numerous and diverse datasets that come with the Big Data era.
2. Integration with Emerging Technologies: As the field of data analysis changes due to emerging technologies like machine learning and artificial intelligence, MIS must adapt to these new paradigms.
3. Scalability: Scalability becomes a crucial issue for MIS in terms of storage, processing, and analytical capabilities as organizations expand and create more data.

2.3. Big Data Impact on Organizational Management

Organisational management practises have been significantly changed by the introduction of Big Data. However, this influence has two sides, creating both possibilities and difficulties:

1. Opportunities for Innovation: By using data-driven insights, big data gives businesses the chance to reinvent their processes, products, and services.
2. Decision-Making Complexity: The sheer amount and complexity of Big Data can overwhelm decision-makers, making it challenging to glean insights that can be put into practice.
3. Resource Allocation: To gather, store, and analyse Big Data, which may put a burden on infrastructure and finances, organizations must distribute resources wisely.
4. Competitive edge: Organizations that successfully leverage Big Data can gain a considerable competitive edge; those that don't run the danger of falling behind.

Modern organisational management must address these issues and seize the chances that the confluence of MIS and Big Data presents. This study aims to offer perceptions and suggestions to effectively negotiate this difficult terrain.

3. OBJECTIVE OF THE STUDY

The main goal of this study is to thoroughly examine how Management Information Systems (MIS) may be strategically used for effective organisational management in the Big Data era. The following auxiliary goals serve as the study's guidelines in order to fulfil its main goal:

3.1. Primary Objective

To look at how Management Information Systems (MIS) are changing in the context of Big Data: This main goal is a thorough investigation of how MIS has changed and evolved in response to the opportunities and difficulties presented by Big Data. It attempts to shed light on the crucial changes in the function and capabilities of MIS as organizations work to properly manage and utilize massive datasets.

3.2. Secondary Objectives

The following are the study's goals:

1. To examine the frameworks and strategies that organizations use to integrate MIS with Big Data for better operational and decision-making efficiency. This aim focuses on identifying and evaluating these frameworks and strategies.
2. To determine the theoretical underpinnings supporting the strategic application of MIS in the Big Data era: This aim entails a critical analysis of the theoretical frameworks and models supporting the Big Data environment. It tries to offer a theoretical framework for comprehending and improving MIS processes in the modern day.

In order to help enterprises navigate the intricate convergence of MIS and Big Data in their quest for efficient and successful management practices, this research addresses three core and secondary objectives.

4. REVIEW OF LITERATURE

The literature study examines how Management Information Systems (MIS) have evolved historically, as well as their theoretical underpinnings, importance in organizational management, the influence of big data, integration issues with big data, and earlier research that has thrown light on this crucial intersection.

4.1. Historical Evolution of MIS

The development of MIS over time shows how it changed from manual information systems to cutting-edge digital platforms. Phillips-Wren, G., & Adya, M. (2020), among other early academics, stressed the significance of information systems in decision-making. According to Plà-Aragonès, L. M. (2021), MIS started out as simple record-keeping systems and progressed through phases like Decision Support Systems (DSS) and Enterprise Resource Planning (ERP). In order to assist managerial choices, these technologies attempted to simplify operations and deliver timely information.

4.2. Theoretical Foundations of MIS

The theoretical foundations of MIS draw from various fields, including management, information theory, and computer science. Scholars like Mishra, R., Singh, R. K., & Koles, B. (2021) contributed to the understanding of decision-making processes, while Costello, W., & Dorris, E. (2020) laid the groundwork for information theory. The Resource-Based View (RBV) theory, which emphasizes the role that resources, particularly information, play in attaining a competitive advantage, was put forth by Zahra, S. A. (2021). According to RBV theory, MIS can be utilized as a strategic resource by organizations.

4.3. MIS's Contribution to Effective Organizational Management

By simplifying the process of making decisions based on data, MIS plays a significant role in an organization's management. MIS, according to Bardhan, I., Chen, H., & Karahanna, E. (2020), enables managers to monitor performance and improves coordination as well as operational efficiency. It provides relevant information to all levels of management, from operational to strategic. According to Misra, S., Roberts, P., & Rhodes, M. (2020), organizations without MIS may experience information overload and inefficiencies.

4.4. Big Data and Its Consequences

Because of Big Data, the corporate environment has altered. The 3Vs (Volume, Velocity, and Variety) have been cited as distinguishing qualities of big data by scholars including Saeed, N., & Husamaldin, L. (2021). Organizations today have access to enormous and varied databases, which has important ramifications. Big Data analytics may enable predictive modelling, reveal hidden trends, and spur innovation George, A. S., Sujatha, V., George, A. H., & Baskar, T. (2023). It also presents problems with data governance, privacy, and security, though Chen, J., Lv, Z., & Song, H. (2019).

4.5. MIS and Big Data Integration

Big Data integration brings both possibilities and difficulties. Big Data has enormous promise, yet researchers like Antonios, P., Konstantinos, & Christos, G. (2023) emphasise the necessity for data integration solutions. Aligning data sources, deploying sophisticated analytics, and assuring interoperability with current MIS systems are all part of integration. Real-time data-driven

choices may be made by organizations with successful integration, according to Elgendy, N., Elragal, A., & Päivärinta, T. (2022).

4.6. Previous Studies on MIS and Big Data

The interaction between MIS and Big Data has been the subject of several research. For example, Mikalef, P., van de Wetering, R., & Krogstie, J. (2021) looked at how Big Data has affected MIS research and practice, emphasizing the need for new techniques. Ferraris, A., Mazzoleni, A., Devalle, A., & Couturier, J. (2019) looked at how big data might improve organisational decision-making processes. Many studies, however, are still exploratory and concentrate on particular sectors or industries, leaving opportunity for more study that tackles the larger ramifications and tactical use of MIS in the Big Data era. This literature review offers a thorough account of the development of MIS historically, as well as its theoretical underpinnings and significance in organisational management. It also emphasizes the transformative potential of big data, as well as the challenges and opportunities, of integrating MIS in such a data-rich environment. There is still a need for a more comprehensive knowledge of how organizations may strategically use MIS in the age of Big Data to improve efficiency and competitiveness, even if earlier research have started to examine this junction.

5. CONCEPTUAL FRAMEWORK

In the era of big data, the conceptual framework offers a theoretical framework for comprehending the strategic use of Management Information Systems (MIS). It includes a variety of elements, Big Data features, MIS integration with Big Data, and a strategic approach to using MIS in an environment rich in data.

5.1. MIS Components

Multiple crucial elements make up management information systems, which make it easier to gather, process, and distribute information inside organizations. These elements consist of:

1. Data Sources: The foundation of MIS is data. It could be structured (like databases) or unstructured (like text documents or social media posts). It is crucial to have the capacity to combine data from diverse sources.
2. Data processing: To produce useful information, MIS processes data. Data cleansing, transformation, and analysis are required for this. Researchers like Saarikko, T., Westergren, U. H., & Blomquist, T. (2020) stress the value of quick and correct data processing.
3. Information Storage: Data must be effectively stored. Databases, data warehouses, and cloud storage platforms are frequently utilized as instruments for information storage.
4. Information Retrieval: MIS gives users the option to get the information they require. Information retrieval is facilitated through query systems, dashboards, and user interfaces.
5. Decision Support: Decision support systems are frequently included in MIS to help managers make well-informed judgements. These platforms offer resources for modelling, forecasting, and data analysis.

5.2. Big Data Characteristics

For the strategic use of MIS, it is essential to comprehend the features of Big Data:

1. Big Data is distinguished by its sheer volume, which frequently outpaces the capabilities of conventional data storage and processing systems Murala, S. R., & Jahankhani, H. (2023).
2. Velocity: Due to the quick generation and updating of data, processing must occur in real-time or very close to real-time Li, W., Batty, M., & Goodchild, M. F. (2020).
3. Variety: Various data kinds, such as structured, semi-structured, and unstructured data, are included in big data. making it challenging to manage. K. Kumar. (2021).
4. Reliability: Depending on the quality and reliability of the data, it might be difficult to make decisions O'Connor, C., & Joffe, H. (2020).

5.3. Integration of MIS and Big Data

1. To fully utilize the power of data, organizations must integrate MIS with Big Data. Data compatibility: Ensuring that data from diverse sources and formats may be unified for analysis AlNuaimi, B. K., Khan, M., & Ajmal, M. M. (2021) is a key component of this integration.
2. Advanced Analytics: Using advanced analytics methods to mine Big Data for insights, such as machine learning and artificial intelligence Bharadiya, J. P. (2023).
3. Scalability: Increasing MIS infrastructure to accommodate Big Data's volume and velocity Ghasemaghaei, M., & Calic, G. (2019). Establishing data governance practises to protect data security and quality is number four Yaqoob, I., Salah, K., Jayaraman, R., & Al-Hammadi, Y. (2021).

5.4. Strategic Utilization of MIS in the Age of Big Data

To maintain a competitive edge in the Big Data era, MIS practises must be matched with organisational objectives. Key elements consist of:

1. Strategic Decision-Making: Using MIS to generate real-time data to guide strategic decisions Jabbar, A., Akhtar, P., & Dani, S. (2020).
2. Innovation: According to Chawla, R. N., & Goyal, P. (2022), innovation is the use of insights from big data to spur changes in processes, services, and goods.
3. Competitive edge: As indicated by Almazmomi, N., Ilmudeen, A., & Qaffas, A. A. (2022), gaining a competitive edge requires superior efficiency and data-driven decision-making.
4. Data Monetization Olszak, C. (2020): Data Monetization means evaluating the possibility of data commercialized use of new revenue streams. To assist organizations with successfully involving MIS in the Big Data age, this conceptual framework offers a comprehensive understanding of how MIS parts and features of big data interact with integration techniques and strategic methods. It serves as a springboard for further study and practical application in organizational management.

6. THEORETICAL FRAMEWORK

The Uses and Gratifications Theory, which has been utilized in various areas, including media studies and edutainment, fills in as the establishment for the theoretical framework of this study. In this part, we examine how the theory might be seen through a lens to comprehend Management Information Systems (MIS) are strategically used for effective organisational management in the Big Data era.

6.1. The Benefits and Gratifications Theory

The Uses and Gratifications of Media, in contrast to conventional media theories, emphasizes how media affects people. The use of media by people is the subject of theory. In the 1970s, Katz, Blumler, and Gurevitch invented it for the first time. This concept shifts the focus on the proactive roles of media users. This Alamäki, A., & Korpela, P. (2021) contends that individuals select and use media consciously in order to satisfy their own desires and goals. The Uses and Gratifications Theory provides a valuable viewpoint on how businesses actively choose and use MIS to meet their informational and decision-making needs in the context of MIS and Big Data. It advises companies to utilize MIS as a tactical tool to address specific organizational issues.

6.1.1. Applying the Uses and Gratifications Theory to Entertainment Computing

The Benefits and Purposes In order to understand why individuals use entertainment media, theory has been extensively applied in media studies. Academics like Hoose, F., & Rosenbohm, S. (2023), who underline that individuals strive for fulfilment in interactive and entertaining media experiences, have broadened this approach to entertainment computing. Video games, virtual reality, and other types of digital entertainment are all included in the concept of entertainment computing. In an organisational environment, MIS may be seen as entertainment computing, but with a different objective. Businesses actively look for benefits from MIS, including as enhanced decision-making, increased operational effectiveness, and competitive advantage.

The theory offers a framework for examining how MIS meets these organizational goals and serves as a source of "entertainment" in the sense that it entertains while also meeting crucial organizational demands.

6.1.2. Examples of Successful Uses and Gratifications in Edutainment

Scholar like Ali, R. (2023) have investigated how the Uses and Gratifications Theory pertains to the field of edutainment (educational entertainment). Edutainment uses entertaining aspects to inform and captivate audiences. Interactive simulations and instructional video games that meet particular learning goals while being fun are examples of effective edutainment applications. For CEOs and decision-makers, MIS may be viewed as a sort of entertainment in the framework of organisational management. In order to assist management decision-making, it aims to satisfy the requirement for timely and pertinent information. Organizations may learn how MIS can successfully engage users and satisfy their information demands by looking at successful edutainment examples, which will eventually improve organisational outcomes. This theoretical model, which is based on the Uses and Gratifications Theory, presents a novel approach to using MIS in the Big Data era. It highlights the active role of organizations in selecting and using MIS to satisfy their specific needs, mirroring the way individuals choose and consume media content. By applying this theory, the study seeks to uncover the strategic and gratification-driven aspects of MIS adoption and utilization in the modern organizational landscape.

7. ANALYSIS EMPIRICAL

The empirical investigation in this study focuses on performing a thorough analysis of previous works to understand how Management Information Systems (MIS) might be strategically used for effective organizational management in the Big Data era. As this is a qualitative and conceptual study, the empirical aspect revolves around reviewing and synthesizing existing literature, identifying research gaps, and drawing insights from prior research.

7.1. Research Methodology

7.1.1. Research Design

Qualitative Research: Because this study is conceptual in character, a qualitative research approach is used. Exploring intricate ideas, concepts, and relationships is a good use of qualitative research Esmaeilzadeh, P. (2023). It makes it possible to thoroughly analyze the corpus of literature and combine intellectual understandings.

7.1.2. Data Collection Methods

This entails a thorough assessment and analysis of the body of scholarly literature, including books, reports, academic papers, and articles on MIS, Big Data, and organizational management.

7.1.3. Data Analysis Techniques

Qualitative Analysis: The main method of data analysis used in this study is qualitative analysis. To find themes, patterns, and links in the literature, qualitative analysis entails methodically classifying and categorizing textual material Vaismoradi, M., & Snelgrove, S. (2019). This method works effectively for highlighting important ideas, theoretical frameworks, and empirical discoveries in connected disciplines.

7.2. Extensive Review of Related Studies

An in-depth analysis of the current literature on the strategic use of MIS in the Big Data era is part of the wide evaluation of relevant works. Researchers like Tchuente, D., & El Haddadi, A. (2023) and Sazu, M. H., & Jahan, S. A. (2022) have examined numerous MIS and Big Data-related topics. The study contains papers that go through the theoretical underpinnings of MIS, its historical history, possibilities and problems in organisational management, and Big Data integration solutions.

7.3. Research Gap Identification

The identification of research gaps is an essential component of this study. It is a rigorous analysis of the existing literature to identify topics that require further research. Research gaps are areas where there is a lack of current knowledge or where there are contradictions and inconsistencies in the literature, according to Henke, J. S. (2023).

7.4. Findings from Empirical Study

The insights obtained from the thorough examination of related studies are included in the empirical study's findings. Key ideas, theoretical frameworks, and empirical data pertaining to MIS, Big Data, and organisational management will be part of these conclusions. The findings' synthesis will provide readers a thorough picture of the status of knowledge in this area at the moment.

7.5. Recommendations

Recommendations are being given to organizations looking to strategically use MIS in the Big Data era based on the findings. Research gaps are areas where there is a lack of current

knowledge or where there are contradictions and inconsistencies in the literature, according to Henke, J. S. (2023).

7.6. Implications for Organizational Management

The combined findings and suggestions will be used to determine the consequences for organisational management. The application of the study's insights to improve decision-making, operational effectiveness, and competitive advantage will be covered in this part. The ramifications will support the overriding objective of effective organisational management in the Big Data era. In summary, the empirical study in this research is qualitative and conceptual in nature, involving an extensive review of related studies, identification of research gaps, synthesis of findings, and the provision of recommendations and implications for organizational management based on the insights drawn from the literature.

8. CONCLUSION

The strategic use of Management Information Systems (MIS) emerges as a crucial aspect in determining the performance and competitiveness of organizations in the ever-changing environment of organisational management in the age of Big Data. This study set out on an exploration to investigate this dynamic intersection, and as we reflect on this undertaking's conclusion, we consider the significant ramifications and revelations that have emerged.

8.1. Summary of Key Findings

Our extensive review of related studies illuminated several key findings:

1. **Big Data's Impact**: The advent of Big Data has reshaped organizational landscapes, presenting both opportunities and challenges. Organizations must adapt to the characteristics of Big Data—volume, velocity, variety, and veracity—to thrive.
2. **Historical Evolution:** The evolution of MIS over time, from simple record keeping to sophisticated decision support systems, highlights how flexible these systems are to the shifting demands of companies.
3. **Integration Challenges:** The integration of MIS and Big Data requires careful consideration of data compatibility, scalability, and governance to unlock their full potential.
4. **Significance of MIS:** MIS continues to be of paramount importance in organizational management, enhancing operational efficiency, decision-making, and coordination.
5. **Theoretical Foundations**: The Resource-Based View (RBV) theory and the application of the Uses and Gratifications Theory shed light on the strategic role of MIS in organizational management.

8.2. Consequences for the Industry

The results of this study have significant consequences for the sector:

1. **Strategic Adaptation:** Organizations must strategically adapt their MIS practices to harness the power of Big Data. Real-time decision-making, innovation, and competitive advantage are within reach for those who can effectively leverage MIS in the age of Big Data.
2. **Data Governance:** To guarantee the quality, security, and compliance of data in the digital era, robust data governance policies are crucial.

3. **Resource Allocation:** Organizations should allocate resources judiciously to collect, store, and analyze Big Data effectively, ensuring a return on investment.

8.3. Contributions in the Field

This work makes several significant contributions to the field:

1. **Theoretical Enrichment:** It enriches the theoretical landscape by applying the Uses and Gratifications Theory to organizational management, providing a fresh perspective on MIS utilization.
2. **Practical Advice**: By offering insights into data compatibility, scalability, and governance, the research gives practical advice to organizations trying to negotiate the tricky terrain of MIS and Big Data integration.
3. **Research Gaps**: It points out significant research gaps, opening the door to more investigation and comprehension of MIS in the Big Data era.

8.4. Limitations of the Study

Although this study offers insightful information, it is not without flaws. The research lacks empirical support through primary data gathering due to its qualitative and conceptual character. Additionally, the scene may continue to change quickly, demanding continual study, due to the constantly growing nature of technology and data practices.

8.5. Future Research Directions

This work brings up a number of intriguing directions for future investigation:

1. **Longitudinal Studies**: Studies that follow the development of MIS and Big Data integration over time can offer better understanding of the trends and difficulties that organizations confront.
2. **Cross-Industry Analysis:** Comparative studies between different industry sectors can reveal sector-specific methods for integrating MIS and Big Data.
3. **Ethical Considerations**: Privacy and data usage ethics are becoming more and more crucial. Future studies should examine how MIS and big data are ethically problematic.
   Therefore, organizations must begin on a dynamic path with flexibility and foresight in order to strategically utilize MIS in the age of Big Data. As we navigate this landscape, the insights gleaned from this study provide a compass, guiding us towards more efficient, informed, and competitive organizational management practices in the digital era.

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