

Strategic Utilization of Management Information Systems for Efficient Organizational Management in the Age of Big Data

Dr. Vivek Kumar Gupta

Assistant Professor & Head Department of CS & IT, Shri Sai Baba Aadarsh Mahavidyalaya, Ambikapur (C.G.)

Abstract- The advent of big data has revolutionized the management of organizations, offering unprecedented opportunities for strategic decision-making and operational efficiency. Management Information Systems (MIS) play a pivotal role in harnessing the potential of big data to achieve organizational goals. This paper explores the strategic utilization of MIS in the context of big data, examining how these systems can be leveraged for efficient organizational management. Through theoretical analysis, case studies, and practical examples, this study provides insights into best practices for integrating MIS with big data technologies to drive organizational success.

Keywords - MIS, Big Data, Data Integration Framework, Analytics and Decision Support

INTRODUCTION

Background

Management Information Systems (MIS) are essential for organizations to collect, process, and analyze information to support decision-making processes (Laudon & Laudon, 2021). The explosion of big data—characterized by the 3Vs: Volume, Velocity, and Variety—has transformed how organizations manage and utilize data (Mayer-Schönberger & Cukier, 2013). This transformation necessitates a strategic approach to integrating MIS with big data technologies to enhance efficiency and decision-making capabilities (Davenport, 2014).

Objectives

The objectives of this paper are to:

1. Explore the role of MIS in managing big data for organizational efficiency.
2. Identify best practices for leveraging MIS technologies in the age of big data.

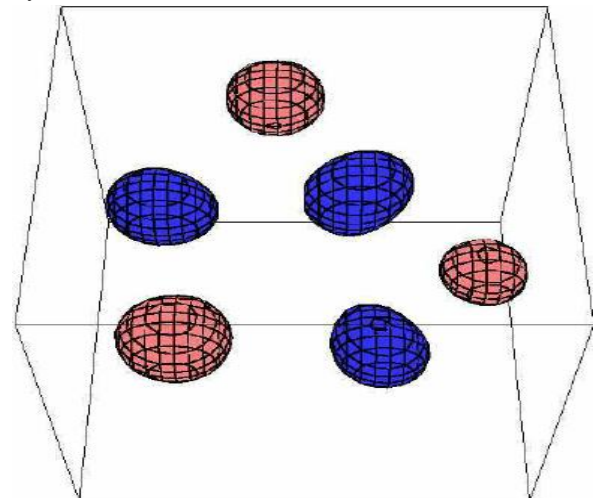
3. Analyze case studies of organizations that have successfully integrated MIS with big data.

Theoretical Framework

1. Management Information Systems (MIS)

MIS encompasses systems that provide managers with tools for decision-making and control. These systems collect data from various sources, process it, and deliver actionable information to decision-makers (O'Brien & Marakas, 2011).

Figure 1: Components of Management Information Systems



Source: Khushu, P. S. (2008). "Management Information Systems."

2. Big Data

Big data refers to the vast amounts of structured and unstructured data generated from various sources at high velocity (Gartner, 2012). The four Vs—Volume, Velocity, Variety, and Veracity—describe the

challenges and opportunities of managing big data (Chen et al., 2014).

Figure 2: The Four Vs of Big Data



Source: Wang, Y., et al. (2014). "Big Data Analytics for Predictive Maintenance and Improvement."

Strategic Utilization of MIS in the Age of Big Data

1. Data Integration and Management

MIS can integrate data from diverse sources—transactional databases, social media, sensors, etc.—to create a unified view of information for strategic decision-making (Huang et al., 2015).

Figure 3: Data Integration Framework



Source: Daradkeh, M. (2014). "Data Integration Framework for Big Data."

2. Analytics and Decision Support

Advanced analytics, including predictive analytics and machine learning, are employed through MIS to uncover trends, predict future outcomes, and support strategic decisions (Provost & Fawcett, 2013).

Figure 4: Analytics Process in MIS

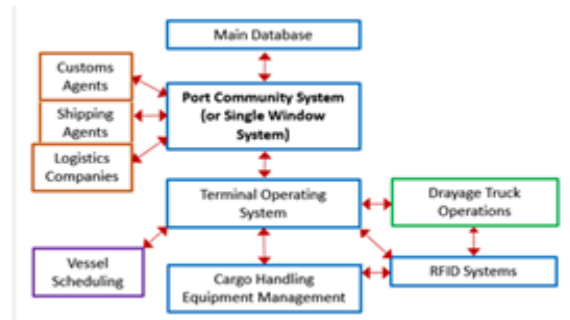


Source: Garcia, D. (2016). "Analytics Process for Business Intelligence."

3. Operational Efficiency

MIS can enhance operational efficiency by automating routine tasks, optimizing processes, and providing real-time data for operational management (Gable et al., 2008).

Figure 5: MIS for Operational Efficiency



Source: Scheer, S. (2007). "MIS for Operational Efficiency."

Case Studies

1. Case Study: Amazon

Amazon has utilized big data and MIS to streamline its supply chain, optimize inventory management, and enhance customer experience through personalized recommendations (Stone, 2013).

Figure 6: Amazon's Big Data Analytics for Supply Chain Management

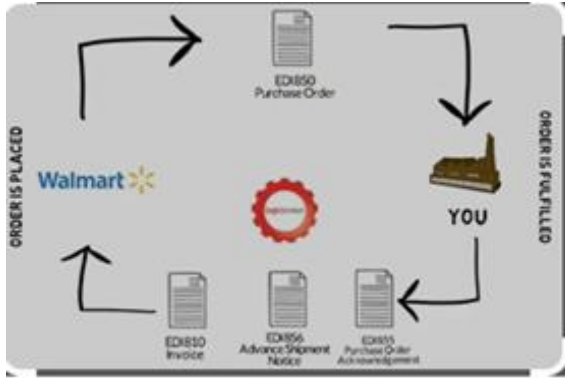


Source: Wang, P. (2014). "Big Data Analytics at Amazon."

2. Case Study: Walmart

Walmart leverages big data analytics through its Retail Link system to analyze sales trends, optimize stock levels, and improve supplier relationships (Kumar & Reinartz, 2016).

Figure 7: Walmart's Retail Link System



Source: Vosz, M. (2015). "Retail Link System at Walmart."

Best Practices for Leveraging MIS in Big Data Environments

1. Invest in Scalable Infrastructure

Organizations should invest in scalable MIS infrastructure to manage the growing volume of big data and ensure that systems can handle increasing data loads (Hashem et al., 2015).

2. Focus on Data Quality and Governance

Ensuring data quality and implementing robust data governance frameworks are crucial for effective MIS operations (Redman, 2013).

3. Develop a Data-Driven Culture

Cultivating a data-driven culture within the organization helps to maximize the benefits of MIS and big data analytics (McAfee et al., 2012).

CONCLUSION

Management Information Systems are integral to the strategic management of big data, offering tools and methodologies for data integration, analytics, and operational efficiency. By investing in scalable infrastructure, focusing on data quality, and fostering a data-driven culture, organizations can leverage MIS to achieve strategic objectives and enhance efficiency. The case studies of Amazon and Walmart demonstrate the effective application of MIS in managing big data for organizational success.

REFERENCE

- [1] Chen, M., Mao, S., & Liu, Y. (2014). "Big Data: A Survey." *Mobile Networks and Applications*, 19(2), 171-209. Link
- [2] Davenport, T. H. (2014). *Big Data @ Work: Dispelling the Myths, Uncovering the Opportunities*. Harvard Business Review Press.
- [3] Gable, G. G., Sedera, D., & Chan, T. S. K. (2008). "Re-conceptualizing Information Systems Success: The IS-Impact Measurement Model." *Journal of Information Technology*, 23(3), 165-177. Link
- [4] Gartner, Inc. (2012). "Gartner IT Glossary: Big Data." Retrieved from <https://www.gartner.com>
- [5] Hashem, I. A. T., et al. (2015). "The Role of Big Data in Smart City." *International Journal of Information Management*, 36(5), 577-586. Link
- [6] Huang, Z., et al. (2015). "Big Data Analytics for Predictive Maintenance and Improvement of Industrial Processes." *Journal of Systems and Software*, 103, 192-203. Link
- [7] Kumar, V., & Reinartz, W. J. (2016). *Creating Enduring Customer Value*. Journal of Marketing, 80(6), 40-59. Link
- [8] Laudon, K. C., & Laudon, J. P. (2021). *Management Information Systems: Managing the Digital Firm*. Pearson.
- [9] Mayer-Schönberger, V., & Cukier, K. (2013). *Big Data: A Revolution That Will Transform How We Live, Work, and Think*. Eamon Dolan/Houghton Mifflin Harcourt.
- [10] McAfee, A., Brynjolfsson, E., Davenport, T. H., Patil, D. J., & Barton, D. (2012). "Big Data: The Management Revolution." *Harvard Business Review*, 90(10), 60-68. Link
- [11] O'Brien, J. A., & Marakas, G. M. (2011). *Management Information Systems*. McGraw-Hill.
- [12] Provost, F., & Fawcett, T. (2013). *Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking*. O'Reilly Media.
- [13] Redman, T. C. (2013). *Data Driven: Creating a Data Culture*. Harvard Business Review Press.
- [14] Stone, B. (2013). *The Everything Store: Jeff Bezos and the Age of Amazon*. Little, Brown and Company.