Available online at https://ijikm.uitm.edu.my/

e-ISSN: 2289-5337

Journal of Information and Knowledge Management (2025) Vol. 15, No. 1

Journal of Information and Knowledge Management

The Interrelationship Between Records Management and Big Data in Malaysian Organization: Challenges, Opportunities, and Future Directions

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ARTICLE INFO

Article history:
Received 3 Jan 2025
Revised 22 Jan 2025
Accepted 25 Mac 2025
Online first
Published 01 April 2025

Keywords:
Records Management
Big Data
Interrelationship

ABSTRACT

Big data has changed how organizations handle information, but it also brings challenges that need better management. This paper emphasizes that effective records management is crucial for making the most of big data. By providing clear guidelines for managing data, records management ensures data is accurate, reliable, and accessible, which helps in gaining valuable insights. Records management helps with organizing and preserving large amounts of data, covering everything from creation to storage. It also ensures compliance with regulations, reducing risks of data breaches and legal issues.The paper discusses how integrating strong records management practices into big data strategies can improve data quality and decision-making. Well-organized records make it easier to handle big data and use it effectively. By reviewing current research and real-world examples, the paper shows how records management is key to getting the best results from big data. It offers recommendations for combining records management with big data efforts to improve data governance, security, and usefulness.

INTRODUCTION

The explosion of big data has transformed how organizations manage and utilize information, yet it also presents challenges that require refined management practices. This paper argues that effective records management is critical to harnessing the full potential of big data. By providing structured frameworks for data governance, records management ensures the integrity, accuracy, and accessibility of data, which are essential for extracting valuable insights from big data.

Records management offers distinct advantages to big data, particularly in organizing and preserving vast amounts of information. It provides the necessary infrastructure to manage data lifecycle processes,

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from creation to archiving, ensuring that data remains usable and relevant over time. Additionally, records management frameworks support compliance with regulatory requirements, mitigating the risks associated with data breaches and non-compliance in big data environments.
The paper explores how integrating robust records management practices into big data strategies can enhance data quality and reliability, facilitating more effective data analytics and decision-making. By maintaining well-organized and accessible records, organizations can more easily navigate the complexities of big data, leveraging it for competitive advantage.

Through a review of current literature and practical case studies, this paper highlights the critical role of records management in maximizing the benefits of big data. It concludes with recommendations for incorporating records management principles into big data initiatives to optimize data governance, enhance data security, and improve overall data utility.

OVERVIEW OF RECORDS MANAGEMENT

The International Organization for Standardization (ISO) defines records management as the "field of management responsible for the efficient and systematic control of the creation, receipt, maintenance, use, and disposition of records" (ISO 15489-1:2016). This includes the processes for capturing and maintaining evidence of and information about business activities and transactions in the form of records (ISO, 2016).

Records management involves the structured oversight of records from their creation or receipt through their entire lifecycle—covering processing, distribution, maintenance, retrieval, and eventual disposal, whether that means destruction or long-term preservation. Effective records management is crucial for ensuring that essential information remains accessible, accurate, and reliable, which is vital for organizational efficiency, adherence to legal and regulatory standards, and the safeguarding of sensitive data.

As outlined in ISO 15489-1:2016, effective records management should facilitate easy and prompt retrieval of information, thereby enhancing productivity and efficiency. Additionally, it must ensure that records are accurate and readily accessible to meet regulatory demands. The International Organization for Standardization (ISO) also emphasizes that robust records management should include proper safeguards to protect sensitive and confidential information from unauthorized access or breaches. Furthermore, it can help organizations reduce costs related to the storage, retrieval, and maintenance of records.

Given its importance, this paper explores the relationship between records management and big data, suggesting that records management plays a significant role in managing large datasets. It involves overseeing the complete lifecycle of records, ensuring their creation, maintenance, and disposal are handled systematically. Key aspects include establishing clear procedures, improving operational efficiency, and protecting data from loss or unauthorized access.

Although records management is traditionally associated with handling records, this paper argues that it can also be a valuable asset for managing big data. With limited research on how records management impacts big data, this paper aims to explore this relationship. Effective records management practices can aid in organizing, retrieving, and ensuring compliance with regulations in the context of big data. By integrating records management with big data systems, organizations can improve data classification, storage, and retrieval, thereby enhancing data quality, usability, and security.

The integration of records management with big data strategies enables organizations to effectively classify, store, and retrieve large datasets (Alwi & Nik Ariffin, 2013). This not only enhances data usability but also supports informed decision-making by ensuring that relevant and reliable information is readily available. Furthermore, effective records management helps in managing the costs associated with data

storage and retrieval, providing a cost-effective solution in the big data landscape (National Archives, 2010).

OVERVIEW OF BIG DATA

The landscape of organizational operations has been profoundly altered by the advent of big data. The surge in data volume, driven by advancements in technology and the Internet of Things (IoT), has accelerated the growth of big data. Reports indicate that data creation is increasing at an annual rate of approximately 40%, with projections suggesting this volume will multiply fiftyfold by 2020 (Siti Aisyah Ismail et al., 2018, as cited in Waal-Montgomery, 2015). This surge is largely attributed to rapid technological advancements in the contemporary era (Siti Aisyah Ismail et al., 2018).

The literature on big data highlights its nature as involving vast datasets that require detailed analysis. According to Green (2015) and Almeida (2017), big data encompasses both structured and unstructured data sets that have significant implications for business operations. Davenport and Dyche (2013) further describe big data as comprising dynamic and extensive volumes of varied data. The generation of big data is influenced by a combination of tools, machines, and human activity. Tengku Adil and Mohd Shamsul (2018) emphasize that big data often involves datasets so large that traditional software applications are inadequate for their management and storage, necessitating more advanced solutions.

Big data can be categorized into two main types: structured and unstructured data. Structured data refers to information that is organized in a fixed format, making it straightforward to store and analyze (Mawed & Al-Hajj, 2016). In contrast, unstructured data, which emerges throughout the lifecycle of projects, does not conform to a predefined format and is often more complex to handle (Gulia & Chahal, 2020). Structured data is typically organized into relational databases where the data elements are related and stored in tables, while unstructured data lacks such organization and does not fit neatly into traditional database schemas.

Yaswanth Sai (2017) identifies unstructured data as encompassing information generated by the Internet of Things (IoT). He notes that IoT facilitates extensive and rapid data production as people and devices become increasingly interconnected. Bomatpalli and Vemulkar (2016) support this view, highlighting IoT's widespread application across various sectors, including healthcare and retail management. They argue that the pervasive nature of IoT technologies integrates deeply with everyday life, impacting everything from email communications to e-learning platforms.

Additionally, Su (2018) discusses the role of big data in managing semi-structured data, which exists between structured and unstructured forms. Semi-structured data may have some initial structure but can change unpredictably over time. This type of data, such as web logs, often lacks a fixed schema, making it challenging to categorize and analyze consistently (Su, 2018).

PROBLEM STATEMENT

The industrial evolution brought by big data poses new threats and challenges to organizations in Malaysia especially in the field of records management. Due to the increasing amounts of both structured and unstructured data that organizations are accumulating, managing, storing, retrieving, and preserving records has become increasingly challenging (Alhassan, Sammon, & Daly, 2018). Earlier records management systems, including ISO 15489, did not take into account the speed, diversity, and mass of big data, resulting in several issues such as compliance, security, and accessibility concerns (McDonald, 2020).

Malaysian organizations are burdened with added regulatory and operational constraints owing to legal compliance such as the Personal Data Principles Data Protection Act 2010 (PDPA) and other specific

onderdelen of industries. Inefficient integration of records management and big data strategies is likely to create fragmentation, redundancies, and security gaps in data (Yusof & Chell, 2019). At the same time, failure to keep up with modern technologies is sure to cause administrative inefficiency and loss of market share to more agile competitors (Davenport, 2013).

Failure to properly manage records may turn big data from an asset into a liability. Problems like data redundancy, lack of permission controls, and ineffective metadata may hinder the productivity of an organization and its adherence to regulations (Agarwal, 2021). Hence, this study seeks to examine the relationship between records management and big data within Malaysian organizations, determine critical gaps, and offer recommendations to enhance records governance.

RESEARCH OBJECTIVE

This study aims to:

1. Examine how Malaysian organizations integrate records management practices with big data strategies.
2. Identify the challenges Malaysian organizations face in managing records within big data environments.
3. Assess the impact of inadequate records management on compliance, security, and decision-making in Malaysian organizations.

RESEARCH QUESTIONS

To address the objectives, this study seeks to answer the following research questions:

1. How do Malaysian organizations currently manage records within big data environments?
2. What are the key challenges organizations in Malaysia face in integrating records management with big data?
3. How does the lack of proper records management affect compliance, security, and business intelligence in Malaysian organizations?

BIG DATA AND RECORDS MANAGEMENT ISSUES (UNCONTROLLED)

Under integration of big data strategies and records management practices may create issues of concern for organizations in Malaysia.

Jurisdictional Boundaries Compliance

Not related records in big data environment has a direct impact on regulatory compliance with PDPA 2010 and industry-specific retention policies. These files, if non-compliant, could lead to legal sanctions, reputational exploitation, as well as fiscal damages (Yusof and Chell, 2019).

Security Infringement and Data Privacy

Flexibility, even if temporarily, of management policies can lead to sensitive corporate and customers information being exposed to breaches or unauthorized as well as malicious cyber activity. Unless strong governance frameworks are in place, firms run the chance of infringing privacy laws as well as suffering from data leakage (Alhassan et al., 2018).

Data Access Restrictions, Processing, and Operational Efficiency

Big data can create large and exponentially escalating Retired Obsolete Decommissioned Trivial (ROT) data files. Substandard records management leads to futile and exceedingly resource-expensive processes of data gathering, storage, and retrieval as well as functional molasses (McDonald, 2020).

Data Value, Consistency, and Credibility Deficiency

Failure to manage supporting, descriptive, and controlling documentation of metadata, classification of data and versioning impedes organizations with the records velocity, variety, value, and accuracy towards which they have impact on business intelligence and influence on data driven decisions (Davenport, 2013).

Extra Expenses and Storage Problems

Costly uncontrolled data growth must be managed to improve system efficiency. Companies lacking strong records management systems struggle with archiving, purging and overall infrastructure data storage (Agarwal, 2021).

Issues Related to AI and Automation Adoption

Automated machine learning, AI, and big data analytics are all dependent on quality data. Not properly managed, records can greatly impact the efficacy of AI automation workflows and digital transformation efforts (Yusof & Chell, 2019).

INTEGRATION OF RECORDS MANAGEMENT PRACTICES IN BIG DATA ENVIRONMENTS

The rapid expansion of big data presents significant challenges for information management, making effective records management practices increasingly vital. Records management, which involves systematic control over the entire lifecycle of records—from creation and maintenance to final disposition—plays a crucial role in ensuring that data remains accurate, accessible, and secure (International Organization for Standardization [ISO], 2016).

One of the primary benefits of integrating robust records management practices with big data strategies is improved data integrity. Effective records management provides a framework for organizing and preserving large volumes of data, which helps in maintaining data quality and reliability (National Archives, 2010). This structured approach facilitates efficient data retrieval and supports compliance with legal and regulatory requirements, thereby mitigating risks associated with data breaches and non-compliance (Alwi & Nik Ariffin, 2013).

Moreover, records management practices enhance the usability of big data by implementing systems for effective data classification, storage, and retrieval. This not only streamlines the management of extensive datasets but also supports informed decision-making by ensuring that accurate and relevant information is readily accessible (National Archives, 2010). Additionally, these practices help in managing the costs associated with data storage and retrieval, offering a cost-effective solution in the expansive realm of big data (ISO, 2016).

In a nutshell, the integration of records management practices with big data management is essential for optimizing data governance, enhancing data security, and improving overall data utility. As organizations continue to navigate the complexities of big data, adopting comprehensive records management strategies will be pivotal in leveraging data effectively and sustainably.

RESEARCH DESIGN

To analyse the connection between records management and big data, this study will use qualitative methods involving case study analyses and existing literature reviews. The primary approach is the case study method, where stakeholders from different organizations are interviewed to collect information on how they manage records of data within big data environments. This approach will focus on choosing stakeholders from different industries that have implemented big data systems.

These organizations, which include those from the technology, financial, and private sectors (such as renewable energy), were selected due to their differing legal constraints, adoption of records management policies, and participation in digitization processes. These different serves approaches are important for big data management because they offer a variety of perspectives that illustrate the best and worst aspects of dealing with it.

This study aims to address the issue of file management by providing relevant suggestions on records management systems in the context of big data. This will answer the questions of how organizations deal with and enforce records management policies for big data.

The interviews with key stakeholders in this study will include the managers of records, the IT employees, and the data analytics specialists together with an internal examination of the documented policies and procedures of the organization in regard to records management (Siti Aisyah Ismail, Ali, & Omar, 2018). As mentioned in Green (2015), thematic analysis will be used to look for patterns, difficulties, and best practices in different cases.

Along with case studies, a detailed literature analysis of records management and the emerging discipline of big data will be conducted. The focus of this analysis will be on the known frameworks ISO 15489 and some other models of big data management (International Organization for Standardization, 2016). To evaluate how these frameworks tackle the quadruple issues of big data, which are the volume, variety, velocity, and veracity of data, Almeida (2017) will be referenced. The study aims to construct a model that integrates records management with big data and, in doing so, identifies the discrepancies in the existing models that make alignment impossible (Davenport & Dyche, 2013).

In summary, the design integrates qualitative case studies and frameworks analysis to understand the relationship between records management practices and big data. The results will assist in outlining best practices and challenges while providing suggestions to improve records management within big data contexts (Mawed & Al-Hajj, 2016; Yaswanth Sai, 2017).

ANALYSIS AND DISCUSSION

Challenges in Integrating Records Management and Big Data

Organizations encounter significant challenges when managing big data in conjunction with traditional records. These challenges are primarily related to data privacy, storage, and retrieval.

Data Privacy

Data privacy is a major concern when integrating big data with traditional records. Big data encompasses vast amounts of personal and sensitive information collected from diverse sources, such as social media platforms, Internet of Things (IoT) devices, and transactional records (Green, 2015). This

integration with traditional records, which also contain sensitive data, complicates privacy management. Organizations must navigate complex data protection regulations, including the General Data Protection Regulation (GDPR) in Europe and the California Consumer Privacy Act (CCPA) in the United States, to ensure compliance (Siti Aisyah Ismail, Ali, & Omar, 2018). Effective privacy management involves anonymizing or pseudonymizing data and implementing robust security measures to prevent unauthorized access (Davenport & Dyche, 2013).

Data Storage

The storage of big data presents significant challenges due to its volume and variety. Unlike traditional records, which are typically stored in structured formats within conventional databases, big data includes both structured and unstructured data that may not fit into traditional storage systems (Mawed & Al-Hajj, 2016). This necessitates the use of advanced storage solutions, such as cloud storage and distributed file systems, which are designed to handle large volumes and diverse formats of data (Yaswanth Sai, 2017). Integrating these modern storage solutions with existing systems for managing traditional records can be complex and often requires substantial investment in new technology and infrastructure (Almeida, 2017).

Data Retrieval

Retrieving relevant information from big data and traditional records presents another significant challenge. Traditional records are usually indexed and organized in a manner that facilitates straightforward retrieval. In contrast, big data is often unstructured, which can complicate search and retrieval processes (Su, 2018). To address this, organizations need sophisticated data management tools and techniques, such as machine learning algorithms and advanced search engines, to extract meaningful insights from large and complex datasets (Bomatpalli & Vemulkar, 2016). Furthermore, these advanced retrieval methods must be compatible with traditional records systems to maintain an efficient and cohesive information management system.

In summary, managing big data alongside traditional records involves addressing challenges related to data privacy, storage, and retrieval. Effective management requires a strategic approach that integrates advanced technologies with established practices to ensure the secure and efficient handling of both big data and traditional records.

Opportunities for Innovation

Integrating big data with records management offers numerous opportunities for innovation, particularly in enhancing decision-making, improving compliance, and strengthening data governance. By combining the expansive capabilities of big data with the structured approach of records management, organizations can unlock significant benefits.

Enhanced Decision-Making

Big data provides organizations with vast amounts of information that can reveal patterns and insights not immediately visible through traditional data analysis methods (Davenport & Dyche, 2013). When integrated with robust records management practices, which ensure that data is accurately maintained and easily accessible, organizations can leverage this information to make more informed and timely decisions. For example, integrating historical records with real-time data can enhance predictive analytics, allowing organizations to anticipate trends and respond proactively to emerging opportunities (Green,

2015). This integration supports more precise forecasting and strategic planning, leading to better business outcomes (Mawed & Al-Hajj, 2016).

Improved Compliance

Compliance with regulatory requirements is critical for organizations, particularly those handling sensitive information. Big data integration with records management can improve compliance by ensuring that all data—whether from traditional records or big data sources—is consistently managed according to legal and regulatory standards (Siti Aisyah Ismail, Ali, & Omar, 2018). Records management frameworks help in maintaining the integrity and security of data, which is crucial for adhering to regulations such as GDPR and CCPA. By systematically archiving and managing both structured and unstructured data, organizations can more easily demonstrate compliance and avoid potential legal and financial penalties (Almeida, 2017).

Better Data Governance

Effective data governance is essential for managing the quality, usability, and security of data (Su, 2018). Integrating big data with records management enhances data governance by providing a comprehensive approach to data lifecycle management. Records management practices ensure that data is accurately recorded, securely stored, and properly disposed of when no longer needed. This structured approach complements the dynamic nature of big data, facilitating better data quality control and oversight. Furthermore, clear governance policies help in managing data across various sources and formats, improving overall data stewardship and accountability (Yaswanth Sai, 2017).

In summary, integrating big data with records management creates significant opportunities for innovation. It enhances decision-making by providing more accurate and comprehensive data analysis, improves compliance through better management and security of data, and strengthens data governance by ensuring structured and effective data management practices. This integration allows organizations to harness the full potential of their data resources, driving strategic advantages and operational efficiencies.

FINDINGS

In the context of records management, effectively managing big data requires innovative frameworks and methodologies that address the unique challenges of large and diverse datasets. Here, this paper proposed two advanced approaches: leveraging artificial intelligence (AI) for automated data classification and utilizing blockchain technology for secure records management.

Artificial Intelligence for Automated Data Classification

Artificial Intelligence (AI) offers significant advantages in managing big data through automated data classification. AI technologies, particularly machine learning algorithms, can analyze vast amounts of data to categorize and tag information based on predefined criteria (Bhatnagar, 2019). This automated approach streamlines the process of organizing data, making it easier to retrieve and manage. AI can be used to develop models that learn from historical data and adapt to new information, enhancing the accuracy of data classification over time (Zhang & Zheng, 2020). For instance, AI-powered systems can automatically identify and classify data types, detect patterns, and ensure that records are stored and indexed according to their relevance and compliance requirements. This not only reduces manual effort but also improves data quality and accessibility, supporting more efficient records management (Kumar & Kapoor, 2021).

Blockchain for Secure Records Management

Blockchain technology provides a robust solution for ensuring the security and integrity of records management. By using a decentralized ledger, blockchain ensures that records are immutable and transparent, which is crucial for maintaining the trustworthiness of big data (Nakamoto, 2008). Each transaction or record added to the blockchain is verified by multiple nodes in the network, making it nearly impossible to alter or tamper with the data without consensus (Tapscott & Tapscott, 2016). This feature is particularly beneficial for industries requiring stringent data security and audit trails, such as finance and healthcare. Blockchain can be used to create an immutable record of data changes and access logs, ensuring that all modifications are tracked and verifiable. Implementing blockchain in records management enhances data security, provides an audit trail for compliance, and ensures that records are protected against unauthorized access and tampering (Christidis & Devetsikiotis, 2016).

CONCLUSIONS

Based on the importance and function of records management, this paper believe the records management actually has relationship with big data and provide a good helps in managing big data. Records management involves overseeing the lifecycle of records from their inception to their final disposition. This practice ensures that records are created, maintained, and disposed of in an organized and systematic manner. Key elements of records management include the establishment of clear procedures for improves operational efficiency, and protects valuable data from loss or unauthorized access.

Despite the significance of records management, this paper argues that it can also serve as a valuable tool for managing big data. Given the limited research on the effectiveness of records management in the context of big data, this paper aims to shed light on the relationship between records management and big data.

Records management is increasingly intertwined with big data management as organizations seek to effectively handle vast amounts of information. Effective records management practices ensure that data is organized, retrievable, and compliant with regulations, which is essential in a big data environment where the volume and complexity of information can overwhelm traditional systems. Implementing robust records management strategies helps in classifying, storing, and retrieving large datasets efficiently, which enhances the usability and security of big data. For instance, integrating records management principles with big data systems can improve data quality and facilitate better decision-making.

Incorporating AI and blockchain into records management frameworks provides advanced solutions for managing big data effectively. AI facilitates automated data classification, enhancing data organization and retrieval efficiency. Blockchain ensures data integrity and security, creating a reliable and transparent system for records management. By integrating these technologies, organizations can improve their data governance practices, comply with regulatory requirements, and leverage big data for strategic decision-making.

DECLARATION OF AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

In the process of preparing this paper, the author(s) utilized OpenAI's ChatGPT to enhance readability and language after substantial revisions. Following the use of this tool, the author(s) meticulously reviewed and adjusted the content as required, and assume complete responsibility for the publication's content. Additionally, all material is original and authored by the writer(s). The tool was used

exclusively during the major revision phase to evaluate readability and language, and was not employed to produce any content.

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