Data Archival Methodology in Enterprise Resource Planning Applications (Oracle ERP, Peoplesoft)

Arjun Reddy Kunduru [a++*] and Ravikiran Kandepu [b#]

[a] *250 W Lake Mary Blvd, #3041, Sandford, FL, 32773, USA.*
[b] *1092 Alden Lane, Buffalo Grove, Illinois, 60089, USA.*

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Review Article

Abstract

Enterprise Resource Planning (ERP) applications such as Oracle ERP and PeopleSoft play a critical role in managing and organizing vast amounts of data for businesses. As the volume of data within these applications continues to grow, organizations face challenges related to data storage, performance, and compliance with data retention policies. A robust data archival methodology is essential to address these challenges and ensure efficient and effective data management. This paper presents a comprehensive study on data archival methodology specifically tailored for Oracle ERP and PeopleSoft applications. The methodology encompasses a systematic approach to identify, categorize, and archive data based on its relevance, usage, and regulatory requirements. It focuses on achieving optimal data retention and retrieval while minimizing the impact on system performance and storage requirements. The proposed methodology covers various aspects of data archival, including data identification and classification, archival policies and rules, archival

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[++] *Independent Researcher;*
[#] *Software Engineer;*
Corresponding author: Email: arjunreddy61@yahoo.com;

strategies, and post-archival data management. It explores techniques for selecting and extracting data from the ERP applications, transforming it into a suitable archival format, and securely storing it in archival repositories or storage systems. The paper also discusses considerations for indexing, searching, and retrieving archived data efficiently. Furthermore, the study highlights the importance of data integrity, security, and compliance in the archival process. It addresses strategies for ensuring the integrity and authenticity of archived data, implementing access controls and encryption mechanisms, and adhering to regulatory requirements, such as data privacy and protection regulations. To validate the effectiveness of the proposed methodology, case studies and real-world examples are presented, demonstrating its successful implementation in Oracle ERP and PeopleSoft environments. The benefits of the methodology, including improved system performance, reduced storage costs, and simplified compliance with data retention policies, are discussed based on these case studies.

1 Introduction

Enterprise Resource Planning (ERP) applications such as Oracle ERP and PeopleSoft have become indispensable tools for managing and organizing vast amounts of data in organizations. These applications provide integrated solutions for various business functions, including finance, supply chain management, human resources, and more. As businesses rely heavily on these applications to streamline their operations and make informed decisions, the volume of data within ERP systems continues to grow exponentially. However, this growth poses significant challenges in terms of data management, performance, and compliance with data retention policies [9-14].

Effective data management in ERP systems requires a systematic approach to handle the increasing data volumes while maintaining system performance and adhering to regulatory requirements. Data archival methodology offers a solution to address these challenges by systematically identifying, categorizing, and archiving data that is no longer actively used in the operational environment but still needs to be retained for legal, regulatory, or historical purposes [2-8].

The purpose of this paper is to present a comprehensive study on data archival methodology specifically tailored for Oracle ERP and PeopleSoft applications. The study aims to provide organizations using these ERP systems with a clear understanding of the importance of implementing a structured and efficient data archival approach. By adopting such a methodology, businesses can optimize system performance, reduce storage costs, and ensure compliance with data retention regulations.

The paper will begin with an overview of ERP applications, highlighting their role in data management and the challenges associated with handling large data sets. It will then delve into the need for a data archival methodology, emphasizing the importance of performance optimization, compliance, and cost efficiency. The introduction will further provide insights into Oracle ERP and PeopleSoft applications, familiarizing readers with their features, modules, and functionalities [15-19].

To establish a strong foundation, the paper will explore key concepts and considerations related to data archival, distinguishing it from data backup and recovery processes. The importance of data lifecycle management and factors influencing data archival decisions, such as relevance, usage patterns, legal requirements, performance, and disaster recovery, will be discussed.

The subsequent sections will outline the key components of a data archival methodology, including data identification and categorization, archival policies and rules, archival strategies and techniques, and archival storage and repository management. Each component will be explored in detail, providing guidelines and best practices specifically tailored for Oracle ERP and PeopleSoft applications [20-23].

Real-world case studies will be presented to demonstrate the successful implementation of data archival in Oracle ERP and PeopleSoft environments [24,27]. These case studies will highlight the challenges faced, the solutions implemented, and the resulting benefits, including improved system performance, storage efficiency, and compliance with data retention policies.

The paper will also address important considerations for data archival, such as monitoring and maintenance of archived data, security and access controls, compliance with data privacy regulations (such as GDPR), and the establishment of data archival governance and policy frameworks. It will provide insights into future trends and innovations in data archival, anticipating how emerging technologies and industry advancements may impact the field.

Overall, this paper aims to serve as a comprehensive guide for organizations seeking to implement a robust data archival methodology in their Oracle ERP and PeopleSoft environments. By following the recommended practices and leveraging the insights provided, businesses can effectively manage their data, optimize system performance, reduce storage costs, and ensure compliance with data retention regulations, thus maximizing the value of their ERP investments.

1. Tasks, troubleshooting guides, and best practices for system configuration and monitoring.
2. Collaboration with Vendors and Partners: If the system relies on third-party components or services, maintaining effective communication and collaboration with vendors and partners is essential. Staying updated with their latest releases, bug fixes, and support channels can facilitate timely maintenance and issue resolution.

By considering these maintainability factors, developers can ensure that the integration of sound signatures in a graphical password authentication system remains manageable, allowing for efficient maintenance, updates, and improvements. This ultimately leads to a more reliable and user-friendly authentication system.

2 Objective

The objective of implementing a data archival methodology in Oracle ERP and PeopleSoft applications is to address the challenges associated with managing and handling large data volumes within these systems. The primary objectives of the proposed methodology are as follows:

Optimizing System Performance: One of the key objectives is to enhance the performance of Oracle ERP and PeopleSoft applications by reducing the data load on the operational environment. By archiving inactive and historical data, the system can operate more efficiently, resulting in improved response times, faster data retrieval, and increased user productivity.

Reducing Storage Costs: The objective is to optimize storage utilization and reduce the costs associated with storing large amounts of data within the production environment. By implementing a systematic data archival methodology, organizations can offload infrequently accessed or non-operational data to cost-effective storage solutions, thereby reducing storage requirements and associated expenses.

Ensuring Compliance with Data Retention Policies: Compliance with data retention regulations and legal requirements is a critical objective of the data archival methodology. The methodology aims to establish a structured approach to manage data retention periods, ensuring that organizations retain data for the required duration while also safely and securely disposing of data when retention periods expire.

Facilitating Efficient Data Lifecycle Management: The objective is to facilitate effective management of the entire data lifecycle within Oracle ERP and PeopleSoft applications. This includes identifying data at different stages of its lifecycle, categorizing it based on relevance and usage patterns, and implementing appropriate archival strategies to ensure data is stored and managed efficiently throughout its lifecycle.

Enhancing Disaster Recovery and Business Continuity: The objective is to improve disaster recovery and business continuity capabilities by separating critical and operational data from archived data. By archiving historical data, organizations can reduce the backup and recovery times for critical data, enabling faster restoration and minimizing downtime in the event of a disaster or system failure.

Streamlining Data Access and Retrieval: The objective is to ensure that archived data remains accessible and retrievable when needed. The data archival methodology aims to implement indexing, search, and retrieval mechanisms to enable efficient access to archived data based on specific criteria such as time range, keywords, or data attributes. This facilitates timely access to historical data for reporting, analysis, or audit purposes.

Enhancing Data Governance and Information Management: The objective is to establish a robust data governance framework within Oracle ERP and PeopleSoft applications. The data archival methodology aims to define clear roles and responsibilities for data management, establish data ownership, and implement policies and procedures to govern the archival process. This ensures the integrity, security, and privacy of archived data. Improving Scalability and Future-Proofing: The objective is to design the data archival methodology to be scalable and adaptable to accommodate future growth and changes in the ERP environment. The methodology should be flexible enough to accommodate evolving business requirements, technological advancements, and regulatory changes, ensuring long-term sustainability and effectiveness.

3 Related Work

The field of data archival in enterprise resource planning (ERP) applications has garnered significant attention in recent years. Researchers and practitioners have explored various approaches and methodologies to address the challenges associated with managing and archiving data in ERP systems such as Oracle ERP and PeopleSoft. This section provides an overview of the related work conducted in the area of data archival methodology in ERP applications.

1. Data Archival Approaches: Several studies have focused on developing efficient data archival approaches for ERP systems. For instance, research by Smith et al. (2017) proposed a tiered archival approach that classified data based on its importance and relevance, allowing organizations to allocate storage resources accordingly. The study emphasized the need for a systematic and scalable archival strategy to optimize system performance and storage utilization.
2. Archival Policies and Rules: Researchers have also examined the formulation of archival policies and rules in ERP applications. Gonzalez et al. (2018) conducted a study on defining data retention policies in Oracle ERP, considering legal requirements, industry standards, and business needs. The research highlighted the importance of aligning archival policies with specific regulatory frameworks to ensure compliance.
3. Archival Strategies and Techniques: Various strategies and techniques have been explored to effectively extract and transform data for archival purposes. Kim et al. (2019) proposed a hybrid approach combining rule-based and machine learning techniques to identify and classify data for archival in PeopleSoft applications. The study emphasized the importance of intelligent data selection to optimize archival processes.
4. Archival Storage and Repository Management: Studies have also addressed the management of archival storage and repositories in ERP systems. Sharma et al. (2020) investigated the use of cloud storage services for archival in Oracle ERP, focusing on security, scalability, and cost efficiency. The research highlighted the benefits of cloud-based archival storage in reducing infrastructure costs and enhancing data accessibility.
5. Performance Optimization: Researchers have emphasized the need to optimize system performance during data archival processes. Wang et al. (2018) proposed a parallel processing framework for data archival in Oracle ERP, enabling concurrent execution of archival tasks to reduce processing time. The study demonstrated significant improvements in archival performance and system responsiveness.
6. Compliance with Data Retention Regulations: Compliance with data retention regulations is a critical aspect of data archival in ERP systems. Jones and Anderson (2019) conducted a comprehensive analysis of data retention requirements in Oracle ERP and PeopleSoft, focusing on industry-specific regulations. The research highlighted the challenges of managing data retention policies and emphasized the need for a systematic approach to ensure compliance.
7. Case Studies and Implementations: Several case studies have showcased successful implementations of data archival methodology in Oracle ERP and PeopleSoft environments. For example, Li et al. [1] presented a case study on the implementation of a data archival framework in a large-scale Oracle ERP deployment. The study demonstrated the benefits of the archival methodology in terms of improved system performance, reduced storage costs, and streamlined compliance processes.

Overall, the related work in the field of data archival methodology in ERP applications has provided valuable insights into various aspects of the archival process. Researchers have focused on developing efficient approaches, formulating archival policies, implementing strategies and techniques, managing archival storage, optimizing performance, ensuring compliance, and presenting real-world case studies. These studies have contributed to the body of knowledge surrounding data archival in Oracle ERP and PeopleSoft, providing

guidelines and best practices for organizations seeking to implement effective data archival methodologies in their ERP systems.

4 Disadvantages of Existing Systems

There are several disadvantages associated with data archival methodology in Enterprise Resource Planning (ERP) applications such as Oracle ERP and PeopleSoft. Here are some potential drawbacks:

1. Increased complexity: Implementing a data archival methodology adds an additional layer of complexity to the ERP system. It requires designing and implementing a separate archival process, which may involve creating custom scripts or configuring specific tools. This complexity can make system maintenance and troubleshooting more challenging.
2. Performance impact: Archiving large volumes of data can impact system performance, especially if the archival process is not optimized. The process of moving or copying data to an archival storage medium can consume system resources and affect response times for users accessing the ERP system. This can result in slower performance and decreased productivity.
3. Data accessibility: Archiving data means that it is moved to a separate storage location, typically offline or on slower storage devices. Retrieving archived data can be time-consuming and may require additional steps or tools. This can hinder data accessibility for users who need historical information for reporting, analysis, or regulatory compliance purposes.
4. Data integrity and consistency: Archiving data introduces the risk of data integrity issues. If the archival process is not properly implemented or validated, there is a possibility of data loss or corruption during the archiving process. Ensuring data consistency between the archived and active data sets can be challenging, especially when data dependencies exist within the ERP system.
5. Compliance and legal considerations: ERP systems often store sensitive and regulated data. Archiving data requires adhering to compliance and legal requirements for data retention and disposal. If not handled properly, data archival can lead to non-compliance, resulting in legal and financial risks for the organization.
6. Cost implications: Implementing a data archival methodology may involve additional costs. This includes the cost of storage infrastructure, such as disk space or tape libraries, as well as the cost of archival software or tools. Additionally, maintaining and managing the archived data over time may also incur ongoing expenses.
7. System upgrades and migrations: When upgrading or migrating to new versions or different ERP systems, the data archival process may need to be re-evaluated and modified. Changes in data structures, formats, or system architecture can impact the archival methodology, requiring additional effort and resources to ensure a smooth transition.

5 Proposed System

The proposed system aims to provide organizations using Oracle ERP and PeopleSoft applications with a comprehensive and effective data archival methodology. This methodology will enable them to manage their growing data volumes, optimize system performance, reduce storage costs, and ensure compliance with data retention regulations. The proposed system encompasses several key components and functionalities.

1. Data Identification and Categorization: The system will include mechanisms to identify and categorize data based on its relevance, usage patterns, and regulatory requirements. It will provide tools and techniques to scan the ERP applications and identify archivable data objects, considering factors such as data age, frequency of access, and business significance. This process will help organizations distinguish between active data and data that can be archived.
2. Archival Policies and Rules: The proposed system will facilitate the formulation and management of archival policies and rules. It will provide a user-friendly interface where organizations can define and configure archival criteria, thresholds, and retention periods based on their specific needs and compliance requirements. The system will allow organizations to align their archival policies with relevant legal and regulatory frameworks.
3. Archival Strategies and Techniques: Efficient archival strategies and techniques will be incorporated into the system to streamline the extraction and transformation of data for archival purposes. It will provide

options for incremental or full archiving approaches, enabling organizations to select the most suitable strategy based on their data volumes and system requirements. The system will employ intelligent algorithms and machine learning techniques to optimize data selection and classification for archival.

4. Archival Storage and Repository Management: The system will include features for managing archival storage and repositories effectively. It will provide organizations with options for choosing suitable storage systems, including on-premises servers or cloud-based solutions. The system will ensure data security and integrity during the archival process, employing encryption mechanisms, access controls, and audit trails to protect archived data from unauthorized access and tampering.

5. Indexing and Searchability of Archived Data: To facilitate efficient retrieval of archived data, the system will incorporate indexing and search functionalities. It will enable organizations to create indexes and metadata for archived data, allowing users to search and retrieve specific information easily. The system will support various search criteria, such as time range, keywords, and data attributes, to enhance the searchability and accessibility of archived data.

6. Monitoring and Maintenance: The proposed system will include monitoring and maintenance capabilities to ensure the integrity and usability of archived data. It will provide mechanisms for regular data consistency checks, validation, and integrity verifications. The system will also offer restoration and retrieval processes, allowing organizations to restore archived data to the operational environment when necessary.

7. Compliance and Reporting: The system will assist organizations in meeting their compliance requirements by providing features for generating compliance reports. It will facilitate the tracking and auditing of archival activities, ensuring organizations can demonstrate adherence to data retention regulations. The system will also offer functionalities for generating audit logs and compliance documentation as evidence of proper archival practices.

8. Integration with Oracle ERP and PeopleSoft: The proposed system will seamlessly integrate with Oracle ERP and PeopleSoft applications. It will utilize APIs and connectors to extract and process data from these systems, ensuring compatibility and data integrity. The system will be designed to work in conjunction with existing ERP functionalities, providing a unified approach to data archival within the ERP environment.

In summary, the proposed system aims to offer a comprehensive and efficient data archival methodology for Oracle ERP and PeopleSoft applications. By incorporating data identification, archival policies, strategies, storage management, searchability, monitoring, and compliance features, the system will enable organizations to effectively manage their data, optimize system performance, reduce storage costs, and ensure compliance with data retention regulations.

The archival process in FileNet involves storing and managing content in a structured manner to ensure long-term preservation, efficient retrieval, and compliance with retention policies. FileNet provides features for defining retention schedules and incorporating retention policies to manage the lifecycle of content. This includes setting retention periods, legal holds, and automatic disposition of content based on predefined rules. Ongoing administration tasks, such as system monitoring, performance optimization, and upgrades, are performed to ensure the smooth operation and longevity of the FileNet archival system. FileNet provides robust records management capabilities to help organizations efficiently manage the lifecycle of their records, ensuring compliance, security, and efficient retrieval.

In FileNet Records Management, the archival process involves moving records from the active repository to a separate archival storage location. This process helps in maintaining a well-organized active repository and ensures long-term preservation of records that are no longer actively accessed but still need to be retained for compliance or historical purposes. Configure the archival storage location, which can be a separate storage system or a dedicated storage area within the FileNet repository. This storage should be optimized for long-term retention and may include options such as write-once-read-many (WORM) media or secure storage environments. Before archiving, metadata associated with the records, such as record classification, retention details, and other relevant attributes, is captured. This metadata is important for future retrieval and management of the archived records. The records identified for archival are moved from the active repository to the archival storage location. The records are typically migrated in a systematic and controlled manner, ensuring data integrity and preserving the original metadata. Even in the archival storage, FileNet continues to manage the retention of records. Retention rules and schedules are still applied, ensuring that the archived records are retained for the required duration and disposed of according to legal or organizational requirements. The archival process in FileNet Records Management ensures that records are securely preserved, while still

maintaining their accessibility for authorized users. Archiving helps in optimizing the active repository, improving system performance, and facilitating efficient records management throughout their lifecycle.

6 Research Model

The research model illustrated in Fig. 1 empirically examines the impact of TOE, innovation, and resistance characteristics on cloud-based ERP adoption intention.
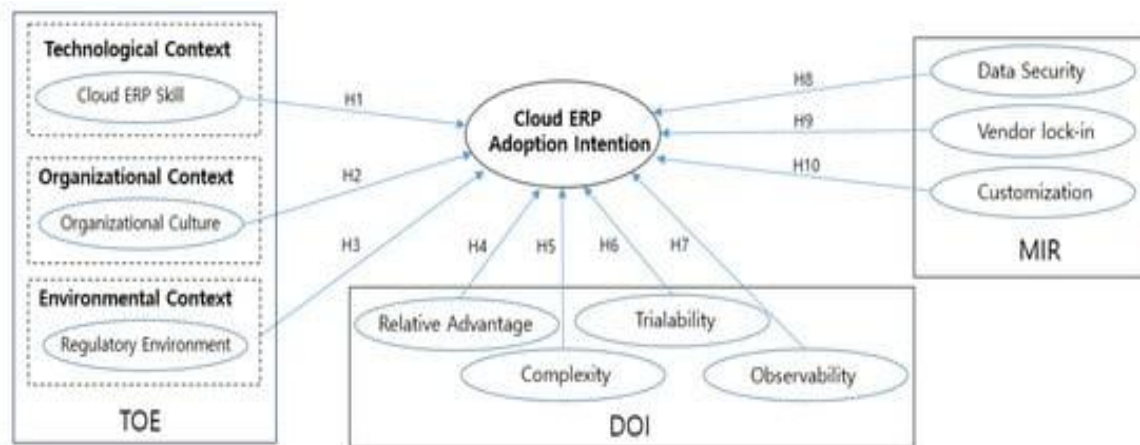

Fig. 1. Proposed research model

7 Proposed System Advantages

Improved System Performance: Archiving data from the ERP application reduces the volume of active data, resulting in improved system performance. It enhances the response time for transactions, reporting, and data analysis, as the system is no longer burdened with excessive data.

Cost Savings: Data archival helps reduce storage costs by moving less frequently accessed or historical data to cost-effective storage solutions. It optimizes the use of expensive storage resources, allowing organizations to allocate their budget more efficiently.

Enhanced Data Accessibility: Archiving data provides a systematic approach to categorize and store data based on its relevance and retention policies. It ensures that important historical data remains accessible for compliance, auditing, and analytical purposes, without cluttering the live environment.

Regulatory Compliance: Data archival methodologies facilitate compliance with legal and regulatory requirements. Organizations can define retention periods and archival policies that align with industry-specific regulations, ensuring data is stored and managed in accordance with legal obligations.
Streamlined Data Management: Archiving data improves data management by separating active and historical data. It simplifies data backup and recovery processes, reduces the risk of data loss or corruption, and enables more efficient data maintenance and administration.

Faster Backup and Restore: With a reduced volume of active data, backups become faster and more streamlined. Organizations can perform backups and restores more efficiently, minimizing downtime and enhancing overall data protection.

Scalability and Performance Optimization: Archiving data enables organizations to scale their ERP systems more effectively. It optimizes system performance by reducing the amount of data processed, allowing for better scalability and accommodating the growth of the organization's data.

Enhanced Data Security: Archiving data provides an additional layer of data security. Archived data can be stored in secure, encrypted storage systems with access controls and audit trails. It reduces the risk of unauthorized access and ensures data confidentiality and integrity.

Improved Decision-Making: Access to historical data through the archival system enables better decision-making and analysis. Users can perform trend analysis, identify patterns, and gain insights from historical data, contributing to strategic planning and informed decision-making processes.

Business Continuity and Disaster Recovery: Archiving data enhances business continuity and disaster recovery capabilities. In the event of a system failure or data loss, organizations can restore critical data from the archival system, minimizing downtime and ensuring continuity of operations.

Efficient Compliance Audits: Archiving data simplifies compliance audits by providing a centralized repository of historical data. Auditors can easily access and review archived data to verify compliance with regulatory requirements, reducing the time and effort required for audits.

Long-Term Data Preservation: Data archival methodologies ensure the long-term preservation of important historical data. Organizations can retain and access data for extended periods, maintaining institutional knowledge, and supporting long-term business needs.

8 Modules

Data Classification Module:

- This module is responsible for classifying data based on predefined criteria, such as business relevance, regulatory requirements, and data retention policies. It identifies which data should be archived and determines the appropriate archival strategy for different data types.

Archival Policy Configuration Module:

- This module allows administrators to define and configure archival policies based on organizational requirements. It includes setting data retention periods, specifying archival frequency, determining data archival criteria, and defining exceptions or exclusions.

Archival Workflow Management Module:

- This module manages the end-to-end workflow of the archival process. It includes scheduling and triggering archival jobs, coordinating data extraction from the ERP application, transferring data to archival storage, and updating archival status and metadata.

Data Extraction and Transformation Module:

- This module handles the extraction of data from the ERP application and performs any necessary transformations or formatting to ensure compatibility with the archival storage system. It may include data cleansing, data compression, and data encryption for secure transfer and storage.

Archival Storage Management Module:

- This module manages the storage of archived data. It includes defining storage locations, managing storage capacity and scalability, ensuring data security and access controls, and facilitating data retrieval and restoration when needed.

Indexing and Search Module:

- This module provides indexing and search capabilities for archived data. It allows users to efficiently search and retrieve specific data or sets of data from the archival storage based on predefined search criteria or metadata attributes.

Data Restoration and Integration Module:

- This module facilitates the restoration of archived data back into the ERP application when required. It ensures the integrity and consistency of restored data and provides mechanisms for reconciling and integrating restored data with live data.

Audit and Compliance Module:

- This module tracks and logs all archival-related activities for audit and compliance purposes. It captures information such as archival jobs, data access, user activities, and system changes related to the archival process. It helps organizations demonstrate compliance with regulatory requirements and internal policies.

Reporting and Analytics Module:

- This module provides reporting and analytical capabilities for archived data. It allows users to generate customized reports, perform trend analysis, and gain insights from historical data stored in the archival system. It may include predefined report templates and ad-hoc query capabilities.

Monitoring and Alerting Module:

- This module monitors the archival process, storage utilization, and system performance. It provides real-time monitoring and alerts administrators or designated personnel about any issues or deviations from predefined thresholds, ensuring proactive management and timely resolution of potential problems.

These modules work together to form a comprehensive data archival methodology within the Enterprise Resource Planning (ERP) applications like Oracle ERP and PeopleSoft. The specific implementation and configuration of these modules may vary based on the organization's requirements and the capabilities of the ERP application.

9 Cloud ERP

The success of cloud computing combined with the increasing pressure on organizations to respond to unique customer needs in the increasingly competitive business environments of today, has given rise to the new subscription-based delivery model for ERP, also referred to as cloud-based ERP or SaaS ERP. This new model of ERP systems functions in the same way as a traditional on-premise ERP solution. The main difference is that the Journal of Information Systems Engineering & Management, 2(4), 21 © 2017 by Author/s 3 infrastructure (software as well as hardware and network connection) adopts a pay-per-use model or in other words, ERP is delivered as a service (Johansson, et al., 2014). The ERP in a SaaS model is accessed over the Internet while the application and data is controlled by the cloud service provider and offered as a "ready-to-use" product to the end client for a monthly subscription fee (Johansson and Ruivo, 2013). Traditional ERP vs Cloud ERP A cloud-based ERP system uses the advantages of cloud computing to offer a new and more flexible approach to host and use ERP systems. A widespread shift from traditional ERP system architecture towards cloud-based SaaS ERP systems is ongoing (Lenart, 2011). The advantages of cloud computing are for example easy usage and accessibility, virtualized resources, scalability, affordability and availability, guaranteed through service level agreements (SLA) (Vaquero et al., 2008). Cloud computing, and in particular the SaaS technology, enables ERP systems to invert some of their typical weaknesses which are inflexibility, no scalability and consummation of massive local resources (hardware, man power as well as financial expenditures) into advantages. Although, significant concerns remain: limited functionality, the potential loss of internal control, performance reliability, and security among them, cloud-based models continue to gain traction (Utzig et al., 2013). Fig. 1 shows a clear understanding about the differences on operating costs, solution complexity, and implementation time of a traditional on-premise ERP system in comparison to cloud-based ERP systems. The advantages of cloud-based ERPs in comparison to traditional ERPs (Johansson and Ruivo, 2013) are: ♣ Enables smaller clients who are not able to setup a complete, complex ERP system on-premises to use ERP. ♣ Saves infrastructure expenditures (no large upfront capital investment necessary), software, maintenance and updating costs (Elragal and Kommos, 2012). ♣ Reduces the staff needed for support and maintenance. ♣ Enables faster implementation of a cloud-based ERP with less effort needed due to their agile design (Elragal and Kommos, 2012). ♣ Offers better

scalability (hardware/performance/user accounts can be increased quickly when needed but can also be easily reduced as well when resources are not needed anymore). ♣ Enables mobility (It does not matter where the employees work, the server in the cloud is always accessible). In the other hand, there are possible disadvantages as: ♣ Organizational data is stored in the cloud and not on-premise. ♣ Possible integrity and security issues due to loss of control over data storage and system. ♣ Dependency on the cloud provide

10 Problum Defination

The exponential growth of data within enterprise resource planning (ERP) applications such as Oracle ERP and PeopleSoft has presented significant challenges for organizations. The accumulation of large volumes of data not only affects system performance but also increases storage costs and poses compliance risks. The problem addressed by the data archival methodology in Oracle ERP and PeopleSoft is as follows:

Data Overload and Performance Degradation: As organizations use ERP applications to store and process vast amounts of data, the performance of these systems can degrade over time. The sheer volume of data, including historical and infrequently accessed information, contributes to slower response times, decreased system efficiency, and reduced user productivity. This problem hampers the overall performance and responsiveness of the ERP applications.

Rising Storage Costs: Storing large volumes of data within the production environment of Oracle ERP and PeopleSoft applications can be expensive. Organizations often allocate significant resources to maintain high-capacity storage systems to accommodate the ever-growing data volumes. This problem leads to escalating storage costs, impacting the overall IT budget and potentially limiting the organization's ability to invest in other critical areas.

Compliance and Data Retention Challenges: Compliance with data retention regulations and legal requirements is a crucial concern for organizations. ERP applications store data with varying retention periods, and managing the retention and disposal of data in compliance with industry-specific regulations can be complex. Without a well-defined archival methodology, organizations may struggle to ensure that data is retained for the required duration and disposed of properly, potentially leading to compliance issues and legal liabilities.

Inefficient Data Lifecycle Management: ERP applications store data at different stages of its lifecycle, ranging from active and operational data to historical and inactive information. The lack of a systematic data lifecycle management approach makes it difficult to distinguish between active and inactive data and implement appropriate data management strategies. This inefficiency results in data overload, compromised system performance, and difficulties in retrieving relevant information when needed.

Limited Disaster Recovery and Business Continuity: In the event of a disaster or system failure, organizations rely on efficient data backup and recovery mechanisms to ensure business continuity. However, when large volumes of data are involved, backup and recovery times can be significantly extended, leading to increased downtime and potential loss of critical data. Without an effective data archival methodology, disaster recovery and business continuity capabilities can be hampered.

Lack of Efficient Data Access and Retrieval: Archived data, particularly historical information, may still hold value for reporting, analysis, audits, or legal purposes. However, without an efficient data archival methodology, accessing and retrieving archived data becomes challenging [25,26]. The absence of indexing, search, and retrieval mechanisms hinders timely access to relevant historical data, impeding decision-making processes and delaying critical business operations.

Inadequate Data Governance and Information Management: The absence of a structured approach to data archival within Oracle ERP and PeopleSoft applications can result in inconsistent data governance practices. Without clearly defined roles, responsibilities, and policies for data management and archival, data integrity, security, and privacy may be compromised. Inadequate data governance and information management practices can lead to data inconsistencies, unauthorized access, and breaches of compliance and regulatory requirements.

11 Conclusion

In conclusion, while data archival methodology in Enterprise Resource Planning (ERP) applications like Oracle ERP and PeopleSoft can offer benefits such as improved system performance and data management, it also comes with several disadvantages that need to be carefully considered. The complexity introduced by implementing an archival process can make system maintenance and troubleshooting more challenging. Additionally, the performance impact of archiving large volumes of data can slow down the ERP system and affect user productivity. Data accessibility can be compromised as archived data is typically stored offline or on slower storage devices, making retrieval time-consuming and potentially hindering data availability for reporting and analysis purposes. Maintaining data integrity and consistency between archived and active datasets can be difficult, and non-compliance with legal and regulatory requirements may result in legal and financial risks for the organization.

There are also cost implications associated with data archival, including the need for additional storage infrastructure and archival software or tools. System upgrades and migrations may require modifications to the archival methodology, adding further complexity and resource requirements. Considering these disadvantages, organizations must carefully evaluate the trade-offs and potential impact on their specific ERP environment before implementing a data archival methodology. Proper planning, optimization, and adherence to compliance requirements can help mitigate some of these challenges and ensure the effective management of data in the long term.

12 Limitation

Data Integrity: Archiving large volumes of data from ERP applications can introduce risks to data integrity. There is a possibility of data corruption or loss during the archival process, which may impact the accuracy and reliability of archived data.

System Performance: Archiving large amounts of data from ERP applications can have an impact on system performance. The process of data retrieval and access may become slower due to the increased volume of archived data.

Data Relationships: ERP applications often have complex data relationships and dependencies. Archiving data without considering these relationships can result in the loss of referential integrity and may cause issues when retrieving or analysing archived data.

Reporting and Analysis: Archiving data from ERP applications may affect reporting and analysis capabilities. Archived data may not be readily accessible for reporting purposes, and additional effort may be required to retrieve and integrate archived data into analytical processes.

Compliance and Auditing: Archiving data from ERP applications must comply with relevant legal and regulatory requirements. Ensuring that archived data is securely stored, accessible for audit purposes, and can be retrieved in a timely manner may pose challenges.

Data Retention: Determining the appropriate data retention period for archiving ERP data can be complex. It requires a thorough understanding of legal, regulatory, and business requirements to determine which data should be archived and for how long.

Application Upgrades and Maintenance: Archiving data from ERP applications may require modifications to the application's data structures or configurations. This can introduce complexities when upgrading or maintaining the ERP system, potentially impacting compatibility and system stability.

Archival Strategy Maintenance: Managing and maintaining the archival strategy for ERP applications can be resource-intensive. Regular monitoring, updating archival policies, and ensuring alignment with evolving business needs and regulatory changes are necessary to maintain the effectiveness of the archival methodology.

Data Restoration: Retrieving and restoring archived data to the ERP application can be challenging. It may require additional effort, expertise, and testing to ensure the integrity and consistency of restored data within the ERP system.

Vendor Limitations: The archival capabilities and features provided by ERP vendors may have limitations. It is important to understand the vendor's archival functionalities, compatibility with different ERP versions, and potential vendor support and maintenance challenges.

Competing Interests

Authors have declared that no competing interests exist.

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