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Final study dissertation

"Master in quality management"

The integration of an electronic archiving system with the quality management system standard ISO 9001:2015

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Abstract

Effective document management is vital for businesses, covering creation to storage. Digital advancements have brought electronic archiving systems, providing software solutions that enhance security, confidentiality, and traceability essential priorities for companies today.

This study aims to identify an electronic archiving system that respects all archiving standards, reduces existing challenges, and prevents future issues while being secure, easy to use, and efficient. Employing a qualitative approach, the research utilized semi-structured interviews with key stakeholders and direct observations to gain a comprehensive understanding of the organizational context at Maghreb Lampe. The findings demonstrate that the software integrated "Odoo", successfully meets archival standards, simplifies document management, clarifies employee responsibilities, and shares access to only authorized personnel. Furthermore, the system received positive feedback from employees, who see it as a successful solution to their archiving challenges, highlighting its possibility to ensure organizational performance.

Key words: archiving, Odoo, document, ISO 9001, QMS.

Résumé

La gestion efficace des documents est essentielle pour les entreprises, couvrant la création jusqu'au stockage. Les progrès de la numérisation ont introduit des systèmes d'archivage électronique, offrant des solutions logicielles qui améliorent la sécurité, la confidentialité et la traçabilité, des priorités cruciales pour les entreprises actuelles. Cette étude vise à identifier un système d'archivage électronique respectant toutes les normes d'archivage, réduisant les défis existants et prévenant les problèmes futurs tout en étant sécurisé, facile à utiliser et efficace. Adoptant une approche qualitative, la recherche s'appuie sur des entretiens semi-directifs avec les parties prenantes clés et des observations directes pour comprendre pleinement le contexte organisationnel de Maghreb Lampe. Les résultats montrent que le logiciel intégré « Odoo » répond avec succès aux normes d'archivage, simplifie la gestion des documents, clarifie les responsabilités des employés et restreint l'accès aux seules personnes autorisées. De plus, le système a reçu des retours positifs des employés, qui le considèrent comme une solution efficace à leurs défis d'archivage, soulignant son potentiel à garantir la performance organisationnelle.

Mots clés : archivage, Odoo, document, SMQ, ISO 9001

ملخص

إدارة الوثائق بفعالية أمر حيوي للشركات، حيث تشمل الإنشاء حتى التخزين. لقد أدت التطورات الرقمية إلى ظهور أنظمة الأرشفة الإلكترونية، التي تقدم حلولاً برمجية تعزز الأمان، السرية، وقابلية التتبع، وهي أولويات أساسية للشركات اليوم. تهدف هذه الدراسة إلى تحديد نظام أرشفة إلكتروني يحترم جميع معايير الأرشفة، ويقلل من التحديات الحالية، ويمنع المشكلات المستقبلية، مع كونه آمنًا، سهل الاستخدام، وفعالاً. باستخدام نهج نوعي، اعتمدت الدراسة على مقابلات شبه منظمة مع أصحاب المصلحة الرئيسيين وملاحظات مباشرة لفهم السياق التنظيمي في مغرب لامب بشكل شامل. تظهر النتائج أن البرمجية المدمجة "Odoo" تلبي معايير الأرشفة بنجاح، وتبسط إدارة الوثائق، وتوضح مسؤوليات الموظفين، وتقتصر الوصول على الأشخاص المصرح لهم فقط. علاوة على ذلك، حظي النظام بتعليقات إيجابية من الموظفين، الذين يرونه حلاً ناجحًا لتحديات الأرشفة لديهم، مما يبرز إمكانيته لضمان الأداء التنظيمي.

الكلمات المفتاحية: الأرشفة، أودو، الوثيقة، نظام إدارة الجودة، آيزو 9001

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Thank you

Amira ALLAOUAT

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EAS: Electronic Archiving System

EDMS: Electronic Document Management System

ISO: International Standardisation Organization

QMS: Quality Management System

GENERAL INTRODUCTION

General introduction

Documentation is essential across various industries, particularly in quality management, where it serves as proof and a formal record of an organization's activities. Properly managing these documents is vital for improving efficiency, meeting regulatory requirements, and maintaining a competitive edge. The ISO 9001:2015 standard highlights this through its "Documented Information" section, which provides guidelines for effective document management. Poor document management, however, can lead to inefficiencies, data loss, and failure to comply with regulations, creating significant challenges for organizations.

Traditional paper-based document systems are becoming outdated as digital solutions take over. These digital tools save time, simplify processes, and better protect against data loss. In businesses, document management especially archiving is critical. By combining digital tools with established document management practices, electronic archiving systems have emerged as a modern, efficient, and secure way to store and manage organizational data.

In Algeria, many organizations still rely on paper-based archiving, which faces issues like limited storage space, risk of losing documents, and concerns over data security and confidentiality. This situation highlights the urgent need to adopt electronic archiving systems to overcome these challenges and align with global standards.

This thesis examines the implementation of an electronic archiving system at Maghreb Lampe, a company facing difficulties with its current document management practices. The study explores why electronic archiving is necessary, evaluates its benefits, and suggests solutions to common archiving problems. It also aims to identify best practices and tools to improve electronic archiving systems in organizations. Additionally, the research seeks to raise awareness among managers and business owners about the importance of a secure and effective electronic document management system.

The main goal of this research is to show the value of electronic archiving systems and their connection to quality management systems in improving organizational performance. It will assess how electronic archiving can address issues like storage limitations, document security risks, and traceability challenges while following ISO 9001:2015 guidelines. Administrative documents, which reliably reflect an organization's processes and regulatory environment, are a key focus of this study.

The thesis addresses these challenges by carefully examining the implementation of an electronic archiving system at Maghreb Lampe. It combines theoretical knowledge with a methodical approach, using a qualitative method that includes semi-structured interviews and direct observation to gain a deeper understanding of the environment and practical applications to answer the question: *How can we improve archiving systems to ensure secure and efficient document preservation?* It contributes to the discussion on digital transformation in document management, with a focus on the Algerian context. The ultimate aim is to encourage organizations to adopt electronic archiving systems or enhance existing ones to meet relevant standards. The research also provides a strategic plan to address document management challenges, ultimately boosting efficiency, compliance, and competitiveness.

Implementing and maintaining an electronic archiving system is a shared responsibility that requires the involvement of all staff and deserves careful attention.

CHAPTER I:

CONTEXT STUDY AND RESEARCH QUESTIONING

Chapter I: Context study and research questioning

This chapter seeks to provide a detailed explanation of the study's contextual framework, outlining its objectives, identifying the research problem, and justifying the selection of the topic. Additionally, it elucidates the epistemological foundations. The chapter also introduces the host company, ISORA Consulting and Accompany, providing comprehensive information about its operations, services, and relevance to the study.

1. Context of the study

In the context of studying electronic archiving systems for businesses, digitalization has made it necessary to shift all processes to digital formats. New technology regularly brings updated methods, standards, and techniques that greatly influence how documents are archived. Businesses must stay current with these standards and practices to maintain efficiency and meet regulatory requirements.

Although many companies use electronic archiving systems, these systems often do not work effectively or follow established rules and standards. Key features like confidentiality, access control, document editing, uploading, and indexing must be carefully organized to meet expert guidelines. Due to the sensitive nature of this area, proper setup is essential.

This study highlights the importance of adopting effective archiving systems to protect company records, reduce the risk of losing documents, and avoid inefficiencies like creating duplicate files. With technology making processes simpler and more user-friendly, a strong electronic archiving system is vital for modern businesses.

2. Research questioning

The global business environment has evolved to simplify transactions, making processes more efficient than ever before. In today's modern world, challenges related to the distribution, safekeeping, and retrieval of documents have significantly diminished, thanks to advancements in technology. Modern technology plays a vital role in the effective management of important documentation (Tanay, Rizal, Philippines & Daluyon, 2024).Furthermore, ISO 9001 specifies that documents should be distributed, utilized, modified, stored, and protected in a secure and efficient manner. The archiving of electronic documents becomes increasingly relevant with each passing year. In the relatively brief period since public and private sector organizations transitioned fully or partially to electronic

document management, a significant amount of electronic information has accumulated that requires proper archiving (Leikums, 2013).

Electronic document management has become an indispensable tool for organizations seeking to enhance their operations. Among its various components, archiving stands out as the most critical aspect. Proper consideration must be given to archiving, as all documents within a community must be preserved. While some companies have implemented electronic archiving systems, these systems often fail to ensure the security and efficiency needed for document management, posing a significant issue.

This study underscores the urgent need to enhance electronic archiving systems in certain organizations due to their vital role in preserving documents effectively and securely. Building on the points mentioned above, the study raises the central question:

"How can Maghreb Lamp improve archiving system to ensure the secure and efficient preservation of documents?"

To further clarify and elaborate on our topic, three additional sub-questions are proposed as follows:

- ***A)*** How can the integration of an Electronic Archiving System help enhance the existing archiving process and resolve the current challenges within the company in accordance with ISO 9001:2015 requirements?
- ***B)*** How can the document archiving system be simplified and structured to ensure its effective understanding and utilization by all employees across the organization?
- ***C)*** What is the relationship between the Quality Management System requirements outlined in Clause 7.5.3 of ISO 9001:2015 and the functionalities of an Electronic Archiving System, and how do they complement each other in ensuring effective control of documented information?

3. Objectives of the study

Conducting a study on the electronic archiving system requires establishing clear objectives to be achieved and adhered to by the end of the research. This ensures a thorough understanding of the subject. The primary focus is directed towards enhancing the existing archiving system within the company and find a solution for the archiving problems faced. Furthermore, the key objectives can be summarized as follows:

- Managing documented information is essential for maintaining accurate records, ensuring traceability, and adhering to compliance requirements effectively.
- Simplify the document archiving process so that every employee can understand and utilize the system effectively. Archiving should not be limited to the informational department but rather become a collective responsibility where all employees can share, upload, and modify documents relevant to their tasks.
- Explore the connection between quality management systems (Chapter 7.5.3 of ISO 9001) and electronic archiving systems (ISO 14641), while highlighting the critical role of documents within these frameworks.

4. Reasons of topic choice

The reasons of the choice of this topic depends on several points.

4.1. Subjective reasons

The choice of this topic is based on personal interest and beliefs. Firstly, we have always been fascinated by the fields of informatics and archiving, which naturally led me to this subject. We are particularly curious about how companies archive and manage their documents. Additionally, we are keen to understand how information is organized, stored, and retrieved in the digital era. Furthermore, we believe that this knowledge is essential and highly valuable, making it an important area of study.

4.2. Objective reasons

We chose this topic due to its alignment with ISO 9001, specifically chapter 7.5.3, which emphasizes the crucial role of documents across all sectors, particularly in the field of quality management. Documentation is a fundamental aspect that must be effectively controlled, shared, and preserved to ensure efficiency and compliance. This makes the study of archiving systems both highly relevant and fascinating, as it addresses the need for secure and organized management of valuable information.

5. Epistemological study

- **Epistemological positioning**

To establish scientific credibility in academic research, it is vital to address both theoretical and methodological aspects. A researcher's chosen epistemological stance profoundly impacts how valid and trustworthy knowledge is generated.(Boukaira & Daamouch, 2021) argue that epistemological reflection is crucial for ensuring the legitimacy and rigor of scholarly

research. Economics and management sciences recognize three primary epistemological paradigms: positivism, constructivism, and interpretivism. All scientific work within these fields must align with one of these paradigms for methodological clarity and coherence.

This study is grounded in the interpretivist paradigm. This perspective challenges the notion of a singular, objective reality, asserting instead that reality is shaped by subjective perceptions and individual experiences. From this viewpoint, knowledge is not discovered but interpreted, with the researcher's understanding being central to representing the phenomena under study. As the previous authors point out, the interpretivist approach emphasizes the contextual and descriptive nature of information, informed by the researcher's own insights and worldview.

Interpretivism

Interpretivism is grounded in the belief that reality is socially constructed. This paradigm holds that reality is inherently subjective, shaped by the observer's experiences and interpretations, rather than existing as an objective entity independent of the observer(Jansen et al., 2023).

interpretivism paradigm: is a research approach in sociology that centers on understanding the subjective meanings and lived experiences of individuals within their social context (Boukaira & Daamouch, 2021). It is commonly adopted in studies where the research objective is to explore how people interpret and make sense of their experiences. This paradigm recognizes that knowledge is constructed through social interactions and emphasizes the importance of context in shaping individual perceptions(Jansen et al., 2023).

6. Relevance of the study

The topic of this study was not selected arbitrarily but rather stems from extensive research and various works dedicated to this theme. Our goal is to present it in a way that is accessible to readers while enriching their knowledge and understanding of the subject.

Theoretical relevance:

This section conducts a thorough review of relevant literature to highlight the critical importance of improving electronic archiving systems within organizations. It underscores the benefits and essential functions of these systems, particularly within the business sector, where efficient document management is vital. Furthermore, it emphasizes that effective

archiving is a shared responsibility, involving all personnel without exception. While electronic archiving systems are applicable across various fields, their significance is most notable in business environments. The study aims to provide a clear understanding of electronic archiving systems and offer valuable insights to support better organizational practices.

Managerial relevance:

The results of this study highlight key factors motivating companies to enhance their archiving systems, given the critical and sensitive nature of archives in organizational operations. Archives serve as essential repositories of evidence and documentation, reinforcing their importance in company processes. Additionally, with advancements in technology simplifying operations, organizations are encouraged to move beyond basic and conventional systems. Embracing improved archiving methods not only optimizes workflows but also ensures efficient traceability, a vital aspect of quality management practices.

7. Place of internship

When talking about the field of quality management there is several concepts that shows up in our mind such as certifications, audits and others. Numerous companies are in charge of those domains and one of those companies we can mention ISORA Consulting and accompany which is a fresh company specialized in integrating quality management system within organizations when needed.

- **presentation of the host company**

ISORA Consulting and accompany is a consulting and training firm based in Algiers, specializing in assisting companies with the implementation, optimization, and certification of management systems according to international standards. The firm operates particularly in the ISO 9001 (quality), ISO 14001 (environment), ISO 45001 (occupational health and safety) standards, but also in the areas of good manufacturing practices (ISO 22716) and social responsibility audits (SMETA).

Recently established by two professionals who graduated from the Higher National School of Management, ISORA relies on solid expertise and IRCA, NEBOSH, and IOSH certified

professionals to offer high value-added services. Despite its recent creation, the firm has already gained the trust of numerous Algerian companies from various sectors.

Among the supported organizations are:

- HONE Travaux Publics (fiber optic network construction),
- ARVEA Nature Algérie (cosmetics),
- Groupe S.Five (wastewater treatment),
- Ibarrar Emballage (industrial packaging),
- INAMED (agri-food),
- Maghreb Lampes (electrical industry),
- Groupe GISB Énergie (transformer manufacturing),
- GISBE Cablerie DZ (industrial cabling),
- Atacor (engineering and energy),
- EURL EXOSAFE (laboratory equipment),
- Laboratoire ET3,
- APMC – UTB Fréha (brickworks),
- Entreprise ESAI (industrial services and insulation),
- Clinique Dentaire Chettouf (health and dental care).

ISORA offers an integrated approach encompassing training, auditing, diagnosis, and support, with rigorous follow-up and adaptation to the specific needs of each company. The firm primarily works with SMEs, industries, healthcare facilities, construction and public works companies, the energy sector, and services.

The management systems implemented by ISORA are recognized for their reliability, as evidenced by the extremely low rate of non-conformities identified during certification audits, notably by reputable international bodies such as Intertek, SGS, and LMS."

- **Mission**

ISORA Consulting and accompany is dedicated to empowering organizations across diverse sectors by providing expert consulting, training, and support services for the implementation, optimization, and certification of management systems. It strives to deliver tailored, high-value solutions that ensure compliance with international standards, such as ISO 9001, ISO

14001, ISO 45001, ISO 22716, and SMETA, fostering operational excellence, safety, and sustainability for our clients.

- **Vision**

To be a leading consulting and training firm in Algeria and beyond, recognized for its expertise, integrity, and commitment to driving organizational success through reliable, innovative, and customized management system solutions that meet global standards and enhance client competitiveness.

- **Objective**

- Assist clients in achieving and maintaining certification to international standards with minimal non-conformities during audits.
- Offer customized solutions that address the unique needs of each client, ensuring rigorous follow-up and adaptability to diverse organizational contexts.
- Provide tailored training, audits, diagnostics, and support to optimize management systems, improving efficiency, safety, and sustainability for SMEs, industries, healthcare, construction, energy, and service sectors.

Conclusion

In conclusion, to gain a comprehensive understanding of the research problem and the contextual framework of the study, this work articulated well-structured concepts to clarify the objectives and, in particular, the core issue of ineffective document management at Maghreb Lampe. The study illuminated the deficiencies of the current archiving system. This approach not only facilitated a deeper exploration of the organizational challenges but also paved the way for identifying and implementing an effective solution namely, the integration of the Odoo electronic archiving system to address the company's document management issues, enhance operational efficiency, and ensure compliance with international standards.

CHAPTER II:

THEORETICAL ASPECT

This chapter aims to examine the relationship between the Quality Management System (QMS) and the Electronic Document Management System (EDMS), with a particular focus on ISO 9001 as key reference standard. It provides a comprehensive discussion on both systems by defining their fundamental concepts, outlining their significance, and highlighting their roles and advantages. Since EDMS encompasses various functionalities, this study will specifically focus on the archiving function, exploring its principles, processes, and relevance within the context of document management.

In order to structure the analysis, the chapter is divided into two main sections. The first section presents a literature review, compiling and analysing existing scholarly works, international standards, and relevant references on the subject. This review serves as a theoretical foundation by summarizing previous research and key contributions in the field. The second section introduces the conceptual framework, which defines and clarifies the essential concepts underlying this study.

Section 01: literature review

This section presents a thorough review of existing research and studies on Electronic Document Management Systems (EDMS), Quality Management Systems (QMS) and electronic archiving system (EAS). It explores key contributions and findings in these fields, emphasizing their interconnection and their influence on organizational efficiency and continuous improvement.

1. Quality management system

Every organization strives for excellence. Quality management plays a crucial role in enhancing the customer satisfaction, which in turn drives business growth and performance. In a highly competitive global economy, implementing a Quality Management System (QMS) is an essential condition for ensuring long-term success (International Standardisation Organization).

To gain deeper insights into the effects of Quality Management Systems (QMS) on organizational performance, a recent study in by (Bereksi, 2022) offers valuable findings. Their research investigates the impact of QMS implementation and certification on Algerian companies, revealing that QMS significantly boosts production efficiency, effectiveness, and

customer satisfaction. Additionally, QMS adoption enhances production levels and reduces various operational risks. In contrast, a 2023 study by (Mohamed Nazmi Md Salikon, Mohd Saiful Izwaan Saadon, 2023)explores the influence of QMS on manufacturing firms' performance using a quantitative methodology. Their results show a strong positive relationship between QMS practices and competitive organizational performance, with firms that foster a quality-centric culture and consistent training programs experiencing greater performance gains.

The field of Quality Management Systems is broad and complex, requiring a comprehensive assessment of its role and impact on organizational performance. A 2021 study by (Gremyr et al., 2021)and Jason Martin examines how different QMS implementation approaches shape managerial perceptions regarding respect, cost-efficiency, and strategic importance. Drawing on Maguad's (2006) framework mentioned in the article studied, which categorizes quality management into three types, the study analyses three distinct QMS applications:

- QMS as a mechanism for enhancing quality offerings (Improvement-Oriented QMS)
- QMS as a framework for routine management (Business Management-Oriented QMS)
- QMS as a tool for standardization and documentation (Compliance-Oriented QMS)

The study underscores the need to distinguish between various QMS applications, advocating for tailored approaches rather than a uniform, one-size-fits-all model. Organizations that leverage QMS as a strategic tool for business improvement and management achieve higher operational efficiency and gain stronger managerial support, transforming QMS from a mere compliance requirement into a catalyst for growth and innovation. Similarly, a study by (Bhatia & Awasthi, 2017)evaluates the impact of QMS on organizational business performance, focusing on mediating factors as information quality, design performance and operating and environmental performance, employing a quantitative approach, their findings indicate that QMS significantly enhances business performance, with mediating factors like product/service quality and competitive priorities playing pivotal roles in converting QMS efforts into tangible performance improvements.

(Patel, 2021)highlights that quality management systems are intended to fulfil customer quality expectations, but their study reveals that achieving customer satisfaction in project management often falls short. Instead, these systems primarily enhance management efficiency and workflow, with limited employee knowledge posing a barrier to effectiveness.

They recommend improved training and regular audits to address these challenges. In contrast,(Refaie et al., 2011) quantitatively examined the impact of quality management practices on customer satisfaction and innovation in ISO 9001-certified Jordanian firms using Structural Equation Modelling. Their results showed that customer focus, continuous improvement, and human resources management significantly enhance customer satisfaction, while process and supplier management had minimal impact. Leadership and HR management were key drivers of innovation, which positively correlated with quality outcomes. Similarly, (Udofia, 2019)investigated the link between quality management practices and customer satisfaction through a quantitative approach, assessing the combined effect of quality management and product quality. The study confirmed significant positive relationships between quality management practices, product quality, and customer satisfaction, though customers hesitated to recommend the product. Udofia suggests implementing clear policies to improve product quality and gathering regular customer feedback to stay attuned to preferences and concerns.

In their study, (Levine & Toffel, 2010) utilized a quantitative comparative-impact approach to assess the effects of ISO 9001 quality management systems across nearly 1,000 matched California firms. Their findings revealed that ISO 9001 adoption significantly improved firm survival, sales, employment, and earnings growth, with a marginal reduction in injury rates but no notable effect on total injury costs, offering key insights into organizational theory, management practices, and public policy. In a study by (Movahedi et al., 2013) conducted research at an Iranian manufacturing firm, employing t-student tests to confirm six hypotheses, demonstrating that Quality Management System (QMS) implementation significantly enhances productivity. They found that sufficient human and financial resources, strong top management commitment, effective change management, adherence to Deming's 14 principles, continuous QMS application, and employee training were pivotal in improving product quality and organizational efficiency by overcoming implementation barriers and resistance. Similarly,(Olkiewicz et al., 2023) study of 1,623 Central Pomeranian organizations used logistic regression to validate the effectiveness of standardized quality management systems (SQMS). Their models confirmed that SQMS enhance quality management, primarily through frequent assessments and a focus on stakeholder satisfaction, while employee involvement in procedure development was found to be statistically insignificant.

2. Electronic document management system

A thorough examination of recent studies on the evolution and impact of Electronic Document Management Systems (EDMS**)** in organizations highlights their increasing role in streamlining document management and optimizing workflows. Researchers widely recognize EDMS as an essential tool for enhancing efficiency and ensuring seamless access to information.

(Aliazas, 2024) study at Laguna State Polytechnic University (LSPU) quantitatively explored the impact of Electronic Document Management Systems (EDMS) on administrative processes, academic management, student services, and research activities. Through surveys of administrators, faculty, and staff, the study assessed EDMS implementation, identifying strengths and areas for improvement, and found it significantly enhanced productivity and efficiency. Strategic planning, challenge resolution, and seamless integration were key to high adoption and sustained use. In (*Mr. Malek Mohammed Kalil Aljamrh 2023*, n.d.)'s qualitative study at the Joint Services Council in Irbid Governorate developed an EDMS framework, applying SWOT analysis and the Rich Picture Technique to improve workflows, document security, and regulatory compliance, emphasizing EDMS's role in digital transformation and strategic planning.(Gamido et al., 2023) quantitatively evaluated a based EDMS model , demonstrating enhanced document storage, retrieval, sharing, and workflow automation, ensuring compliance and reducing paper waste. (Gani et al., 2024)assessed EDMS functionalities in Malaysia, highlighting their effectiveness in managing document lifecycles creation, storage, retrieval, version control, workflow, and multi-format delivery (e.g., PDF, Word, Image) and enabling change tracking, thus boosting system efficiency. (Jordan et al., 2022) qualitatively analysed Document Management Systems (DMS), noting their role in digitalization by enabling secure storage, workflow automation, data-driven decisions, enhanced efficiency, flexibility, and legal compliance, while reducing environmental impact through less paper use. Finally, (Cumpa et al., 2023) qualitative review of document management in public entities underscored the benefits of good practices efficient data organization, accessibility, version control, and security resulting in cost savings, faster service, improved operational speed, easier task navigation, and environmental sustainability, highlighting their growing importance across institutional sectors.

3. Electronic archiving

Organizations are increasingly adopting electronic archives as a modern solution to data management challenges. This transition from paper-based systems enhances efficiency, preserves information, and mitigates risks such as document loss or damage. Electronic archiving improves accessibility, accelerates retrieval processes, ensures compliance with regulatory standards, and facilitates sophisticated methods like metadata indexing and automated classification. By streamlining workflows and supporting informed decision-making, it serves as a critical tool for modernizing information management in the digital age.

In the study of 2022 by (Saad et al., 2022) explored the transformative effects of digitalization on archival practices, focusing on the life cycle of electronic documents. They critically assessed the applicability of traditional archival principles in digital contexts, highlighting electronic documents and data as key archival objects. Their findings emphasized proactive management from document creation to ensure authenticity, integrity, and long-term preservation, advocating for the records continuum model due to its alignment with the dynamic, non-linear nature of digital records. While traditional life cycle models remain relevant in some cases, the study stressed their need for adaptation to address digital archiving challenges effectively. Building on the theme of digital preservation, (Guyon, 2020) study examined the impact of archiving practices on the inherent instability of born-digital objects, particularly their reliability and authenticity. She argued that digital preservation processes often render these dynamic objects static, necessitating robust mechanisms like metadata frameworks, traceability systems, and logical footprints to safeguard their integrity and authenticity, complementing the need for adaptive archival strategies.Further expanding on the complexities of digital archiving, (Belin & Rietsch, 2016) study investigated the challenges of digital transformation through a qualitative case study approach, with a focus on risk analysis. They underscored the importance of well-defined archival policies to ensure the integrity, confidentiality, provenance, and long-term accessibility of digital documents. To mitigate risks, they proposed using multiple technical infrastructures instead of a single system to optimize resources and share risks, aligning with the need for robust systems highlighted in prior studies. Their emphasis on economically viable and secure technologies reinforced user confidence in archived data's authenticity, echoing the proactive management advocated by Saad et al. Similarly addressing governance challenges, (Bachoué Pedrouzo, 2014) study analysed the legal and governance issues in managing digital archives within

public administration. Through a review of existing legislation, she argued that paper-based legal frameworks are inadequate for digital archives, advocating for secure, adaptable governance systems, long-term preservation measures, and legislative reforms to support effective digital archiving practices, a concern that resonates with the need for policy adaptation in Belin and Rietsch's findings.

Complementing these perspectives, (Saad et al., n.d.) study focused on data reversibility in electronic archiving systems to manage technological dependence. They highlighted the risks of non-reversibility, such as financial costs and loss of critical records, emphasizing that reversibility is both a technical and legal necessity for maintaining the probative value of electronic evidence. Their advocacy for standards, transparency, and collaboration among legal, archival, and technical professionals to ensure business continuity and document integrity aligns with Pedrouzo's call for robust systems and the multi-infrastructure approach proposed by Belin and Rietsch. Together, these studies underscore the multifaceted challenges of digital archiving, advocating for adaptive models, robust governance, risk management, and technical-legal collaboration to ensure the authenticity, integrity, and accessibility of electronic records.

Positioning of the study

To illustrate the connection between Electronic Archiving Systems (EAS) and Quality Management Systems (QMS), we conducted an in-depth review of multiple studies, including those on Electronic Document Management Systems (EDMS), as referenced in the provided literature. These studies, spanning QMS (Levine & Toffel, 2010; Movahedi et al., 2013; Olkiewicz et al., 2023), EDMS (Aliazas, 2024; Cumpa et al., 2023; Gamido et al., 2023; Gani et al., 2024; Jordan et al., 2022; *Mr. Malek Mohammed Kalil Aljamrh 2023*, n.d.)

and EAS (Bachoué Pedrouzo, 2014; Belin & Rietsch, 2016; Guyon, 2020; Saad et al., n.d.) reveal significant commonalities. Collectively, QMS, EAS, and EDMS aim to enhance organizational performance by improving productivity, efficiency, and process optimization. QMS achieves this through standardized processes, as seen in (Olkiewicz et al., 2023) logistic regression models showing SQMS (standardized quality management system) effectiveness driven by frequent assessments and stakeholder satisfaction, and (Movahedi et al., 2013)findings on resource allocation and Deming's principles boosting productivity. Similarly, EDMS streamlines workflows and document handling, with (Gamido et al.,

2023)highlighting enhanced university operations and demonstrating improved document accessibility and automation in LAN-based systems. EAS focuses on long-term preservation and integrity, as (Saad et al., n.d.) advocate for proactive management using the records continuum model, and (Guyon, 2020) emphasizes metadata frameworks for authenticity. All three systems optimize processes QMS through quality control(Levine & Toffel, 2010), EDMS via automation and version control (Gani et al., 2024) and EAS by ensuring reliable record management (Belin & Rietsch, 2016)Additionally, they share goals of ensuring compliance, maintaining document/data integrity (e.g., audit trails in EDMS), traceability in EAS and supporting environmental sustainability through reduced paper use, as noted in (Jordan et al., 2022) and (Cumpa et al., 2023).These overlapping objectives underscore the synergistic link between QMS, EAS, and EDMS in driving organizational excellence through structured, compliant, and efficient systems.

Section 02: Conceptual framework

I. Quality management system and documentation

1. Overview about QMS

1.1. Quality management system definition

QMS is a collection of business processes focused on consistently meeting customer requirements and enhancing their satisfaction. It emphasizes alignment with an organization's purpose and strategic direction, incorporating policies, processes, documented information, and resources needed to implement and maintain it (ISO 9000:2015).

1.2. Quality

Quality is defined as the ability of a set of intrinsic characteristics of a product, service, or process to meet predefined requirements. According to ISO 9000:2015 (3.6.2), quality is based on compliance with customer expectations and needs.

The term "quality" applies to both products and services, with the primary objective of ensuring compliance with customer requirements.

1.3. Evolution of QMS

Quality management has evolved from basic inspection methods to sophisticated statistical techniques that enhance production standards. Early approaches relied on subjective assessments, but advancements in the 20th century led by figures like Shewhart and Deming introduced statistical tools that significantly improved quality control. Over time, ISO standards reinforced standardization and introduced methodologies such as failure mode and effects analysis (FMEA) to prevent defects and optimize processes. Thought leaders including Deming, Crosby, Juran, Feigenbaum, Ishikawa, and Shingo further shaped modern quality management by integrating continuous improvement strategies.

The focus of quality initiatives eventually shifted toward process enhancement, incorporating frameworks like reengineering, Six Sigma, Lean principles, and updated ISO standards. This transition paved the way for Business Excellence Models (BEMs), originally rooted in Total Quality Management (TQM). However, after a framework revision in 1999, the term TQM

was replaced with business excellence, reflecting a broader and more performance-oriented approach to quality management (Rocha-Lona et al., n.d.).

1.4.Principals of quality management

Quality management depends on several key principles which enhance the organizational performance, customer satisfaction and continuous improvement. These principles are collected in seven points represented in:

- Costumer focus
- Leadership
- Continuous improvement
- Process approach
- Personal implication
- Decisions taking based on proofs
- Relationship management with stakeholders.

1.5.Norm iso 9001

ISO 9001 is a globally recognized standard for quality management, adopted by over a million organizations worldwide. It sets guidelines for processes that govern the creation and control of products and services, ensuring systematic operations that meet customer expectations. Its universal applicability makes it suitable for any industry, product, or service, providing a reliable framework to enhance efficiency and maintain quality standards on a global scale.

(Kapaj & Shahu, 2015) highlights three key advantages of ISO 9001 certification:

- **Improved Efficiency**: Streamlining business processes and minimizing waste to enhance operational performance.
- **Enhanced Customer Satisfaction**: Delivering consistent quality and aligning with customer expectations to build trust.
- **Better Employee Relations**: Fostering teamwork and promoting a culture of continuous improvement within the organization.

Initially released in 1987 by the International Organization for Standardization (ISO), a global entity encompassing over 160 national standards bodies, ISO 9001 has been instrumental in defining quality assurance and management practices over the past three decades.

To address evolving business dynamics, the 2015 revision introduced substantial updates, ensuring the standard's flexibility, relevance, and adaptability to contemporary organizational demands(Medic et al., 2016).

1.6. Importance of QMS

Achieving excellence is a priority for every organization, as the quality of a product or service ultimately defines customer satisfaction and perceived value**.** Quality management plays a crucial role in delivering an outstanding customer experience, directly impacting a company's growth and overall performance, it provides:

- **Strengthening Brand Reputation**: Consistently surpassing quality standards earns global recognition and fosters consumer trust, enhancing the organization's image.
- **Boosting Customer Loyalty**: Meeting and exceeding customer expectations promotes loyalty, keeping clients engaged and reducing the risk of losing them to competitors.
- **Ensuring Long-Term Sustainability**: Maintaining operational excellence supports a stable customer base while encouraging sustainable practices that optimize resource use and minimize waste.
- **Facilitating Regulatory Compliance**: A Quality Management System (QMS) simplifies compliance with legal, regulatory, and safety standards, ensuring smooth and transparent operations.
- **Gaining a Competitive Edge**: Providing superior products and services offers organizations a strong advantage in an increasingly competitive market.
- **Enhancing Employee Engagement and Productivity**: Involving employees in ongoing quality improvement initiatives boosts their motivation, commitment, and
- efficiency, creating a more productive workforce.

2. Documentation

Documentation presents an essential point in the quality management domain.

2.1. Definition of documentation

Documentation consists of a collection of documents, information, and resources designed to provide explanations, details, or instructions on a specific topic. It plays a vital role in knowledge transfer and communication, enabling users to effectively understand and utilize products, systems, or processes.

Documentation includes the information and its media, necessary to ensure the traceability, preservation, and accessibility of relevant data within an organization (ISO 9000:2015).

2.2. Document

In common usage, the term **"document"** refers to an information carrier, usually in written or graphical form, either on paper or in digital format. It is systematically organized to fulfil a specific purpose. Traditionally, a document consists of a single sheet or a collection of papers, such as a memo, a letter, or a bill of materials. Fundamentally, a document is defined by its ability to be easily transferred, stored, and managed as a single unit**.**

2.3. The lifecycle of document

In digital language, a document is a text file containing fonts, colors, formatting, and other elements. It follows a lifecycle that begins with its creation and ends with its deletion or preservation(Abbasova, 2020a).

- **Creation:** marks the starting point of a document's lifecycle within an Electronic Document Management System (EDMS). During this initial stage, documents are generated or produced, either by converting physical records into digital formats or by creating new electronic files
- **Management/Storage:** In the Electronic Document Management System (EDMS) process, the management and storage phase involve systematically storing documents in databases, archives, or other secure storage systems. This step ensures that documents are preserved in an organized manner.

- **Access:** involves retrieving stored documents using specialized tools designed for efficient search and recovery. This step enables authorized users to locate and view documents quickly.
- **Extraction:** involves viewing and retrieving search results in diverse formats tailored to user needs. This step enables authorized users to access and interact with retrieved documents.
- **Administration:** involves the oversight and management of documents by authorized users. This step encompasses tasks such as organizing, updating, distributing, and archiving documents.
- **Reassignment:** involves generating a new version of a document whenever modifications are made. This step ensures that changes are systematically tracked and documented, maintaining the integrity and traceability of the document's lifecycle while preserving earlier versions for reference and compliance purposes.
- **Collaboration**: involves the efficient exchange of documents among users, enabling shared access, real-time updates, and collective contributions
- **Distribution**: ensures the safe and controlled transfer of documents, protecting their integrity and confidentiality. Through secure channels and encryption, sensitive information remains safeguarded from unauthorized access or alterations.
- **Saving**: refers to the systematic retention of data for a designated period, ensuring accessibility and preservation for future reference. It involves secure storage mechanisms that maintain data integrity, comply with regulatory requirements, and support efficient retrieval when needed.
- **Utilization:** encompasses the secure and systematic destruction of documents once their designated storage period concludes.
- **Archiving:** involves the structured and secure long-term storage of valuable documents, ensuring their preservation for future reference and compliance.

2.4. Document value and importance

Documentation constitutes a foundational element of document management, ensuring the systematic organization, accessibility, security, and traceability of information. It plays a pivotal role in facilitating compliance with legal, regulatory, and industry-specific standards, such as ISO 9001 for quality management systems and ISO 14641 for electronic archiving protocols.

- Effective documentation centralizes all necessary information such as account details and instructions into an organized system, saving time otherwise spent searching for it. It streamlines task delegation, project planning, and team collaboration by making essential details easily accessible. Additionally, tracking processes helps identify workflow inefficiencies, enabling teams to improve and optimize operations.
- Documentation ensures quality and consistency in processes while allowing flexibility in execution. It promotes knowledge sharing, helping team members understand procedures and expectations for recurring tasks like reports or presentations. With documentation as a resource, teams can maintain cohesion and meet essential requirements while fostering creativity in their work.
- Documentation helps eliminate redundant work by organizing past projects, consolidating research, and sharing decisions. This approach saves time and resources by enabling teams to build on existing efforts rather than duplicating them, ensuring efficiency and maximizing productivity.

2.5. Documented information and quality management system

ISO 9001:2015 serves as a cornerstone in quality management, specifying essential requirements for developing a comprehensive and effective Quality Management System (QMS). A key aspect of this standard is its emphasis on documented information (document and record) which acts as a crucial pillar for the QMS framework. This ensures organizational consistency, reliability, and adherence to regulatory requirements across processes.

Documented information plays an indispensable role within the QMS. It provides a systematic method for capturing organizational knowledge, defining operational processes, and setting quality objectives. Without documented information, organizations would face considerable challenges in maintaining consistency and achieving continuous improvement, underscoring its fundamental importance in quality management practices.

➢ Control of documented information

Clause 7.5.3 of ISO 9001:2015 highlights the critical importance of controlling documented information to maintain the integrity and effectiveness of a Quality Management System (QMS). Proper control ensures consistency, traceability, and compliance within the organization's processes.

- **Explication of 7.5.3.2 clause" Control of documented information"**

Clause 7.5.3.2 of ISO 9001:2015 requires organizations to control documented information throughout its lifecycle by managing its distribution, access, storage, modification, retention, and disposal. These measures ensure the integrity, availability, and confidentiality of the information. It consists of:

- The structured management of documented information is essential to ensuring efficiency and security within an organization. Responsibilities must be explicitly assigned to designated individuals or teams to guarantee accountability in handling and maintaining documents. Secure systems, such as digital platforms and document management solutions, should be utilized to enable controlled access and accurate monitoring of document usage
- To comply with Clause 7.5.3.2 b of ISO 9001:2015, organizations must ensure secure storage of documented information to maintain its preservation, protection, and readability throughout its lifecycle. Measures should include safeguarding physical and digital storage against damage, loss, and unauthorized access, as well as implementing backups, version control, and security protocols to maintain integrity.
- In alignment with Clause 7.5.3.2 c of ISO 9001:2015, organizations must implement stringent controls to effectively manage changes to documented information. This involves ensuring that only approved and current versions of documents are accessible for use, supported by the adoption of version control systems and comprehensive revision tracking. Outdated versions should either be clearly labelled as obsolete or removed entirely to avoid accidental usage. Additionally, it is crucial to restrict modification rights to authorized personnel, thereby maintaining the precision, uniformity, and dependability of the documented information.
- Clause 7.5.3.2 d of ISO 9001:2015 requires organizations to define retention periods and secure elimination methods for documented information. These measures ensure compliance with legal and regulatory requirements while safeguarding sensitive information during disposal. Proper retention and disposal controls maintain the integrity and security of documented information throughout its lifecycle.

Through the implementation of stringent controls across the entire documentation lifecycle including distribution, access, storage, modification, retention, and disposal ISO 9001 ensures the safeguarding of critical information. These measures guarantee that documented information remains accurate, secure, and compliant with applicable requirements, thereby reinforcing its pivotal role as a foundation of effective quality management.

3. Electronic document management system in details

The Electronic Document Management System (EDMS) holds significant importance in modern organizations and the broader business environment, particularly in today's digital age. As companies increasingly adopt paperless workflows, EDMS has become an indispensable tool for businesses of all scales, ensuring streamlined processes and efficient document management.

3.1. History and evolution of EDMS

Electronic Document Management (EDM) originated in the 1960s and 1970s with basic systems for digitizing paper documents to improve accessibility. Historically, documents were stored on paper, which required time-consuming manual searches. The advent of digital solutions revolutionized this process, enabling efficient electronic storage and exchange of documents.

By the mid-1990s, EDM became a cost-effective alternative to paper-based storage. It allowed remote access to centralized digital repositories, facilitated global information sharing, and eliminated the need for extensive physical storage, optimizing space and efficiency (Digitech Suisse SA,2022).

3.2. The limitations of traditional Document Management

Traditional Document Management is characterized by the passive handling of files, where documents are stored after users no longer need them. Users frequently bypass or disregard organizational protocols for filing documents within records centres or designated file rooms. Once users acquire the documents relevant to their activities, they often retain the information for personal use. In most cases, documents associated with a project are only organized and compiled upon the project's completion. This approach lacks added value in systems for

requesting, receiving, and disposing of documents stored in inaccessible or irretrievable file folders.

Additionally, traditional Document Management relies heavily on paper-based processes, resulting in issues such as lack of traceability, potential loss of information, fragmentation, and restricted accessibility.

The escalating volume of document creation and its dissemination through electronic mail systems have further exacerbated challenges related to document security, control, tracking, and retrieval.

The following characteristics of contemporary document management aim to address and restructure the limitations of traditional methods:

- The majority of information exchanged within industrial organizations is encapsulated in documents.
- Newly created documents are predominantly digital, with many older documents being converted into digital formats.
- Document-related activities such as creation, distribution, and manipulation are increasingly conducted using computers and networked systems.
- The use of electronic documents allows for traceability, which can be leveraged for measurement and analysis to enhance enterprise processes.

3.3. Definition of EDMS

Document management, as both a technology and a discipline, surpasses the fundamental capabilities of a computer's file system by incorporating advanced mechanisms for handling data. It involves storing, locating, updating, and sharing information, which ensures the smooth progression of workflows and the achievement of business goals (Abbasova, 2020b).

Moreover, EDM is described as a computerized process for organizing and managing electronic documents within organizations, facilitating collaborative workflows, ensuring secure access, and optimizing information exchange to boost productivity and operational efficiency (*Olivier DUCROCQ 2022*).

3.4.Electronic document

Information technology has enabled the creation of a novel type of document an electronic document which integrates various elements such as graphics, text, computer-aided design (CAD), and multimedia objects, including audio and video clips. These documents are processed and stored digitally, no longer existing as tangible, physical entities but rather as digital constructs.

In the digital era, a document is no longer merely a medium where words are positioned on a page. Instead, it comprises a collection of interrelated elements or objects, unified by a common topic. This evolution has led to a redefinition of the term "document" within the electronic context:

"***An electronic document is an information container in digital form, aggregating content from diverse sources and formats on a specific topic to fulfil the needs of a particular individual***" (Abbasova, 2020a).

An electronic document is any content maintained in digital form, such as text, sound recordings, visual materials, or audio-visual content.

3.5.The process of EDMS

Electronic Document Management Systems (EDMS) simplify document processes through four essential stages that facilitate the digitization, organization, protection, preservation, and accessibility of documents, significantly improving overall efficiency.

- **Acquisition**

As a critical initial step in the Electronic Document Management System (EDMS) process, acquisition involves capturing and integrating documents into the system, either manually or automatically. This step encompasses digitizing physical documents or incorporating existing electronic files (e.g., PDFs, DOCs, XLSs). It includes creating digital versions of paper documents or leveraging pre-existing files, recording essential metadata (e.g., names, numbers, keywords) to integrate documents into a validation workflow, classifying files within a logical structure enhanced by metadata for efficient retrieval, and indexing documents with keywords or full-text search capabilities to optimize access and usability.

- **Management**

Following the acquisition of documents in an Electronic Document Management System (EDMS), the management phase involves applying rules to ensure effective control and organization. This step includes establishing security and access controls to define user permissions and protect sensitive documents, administering tasks such as classification, distribution, and archiving to maintain an organized system, and managing the document lifecycle by overseeing validity, updates, and versioning to ensure documents remain current and compliant throughout their use.

- **Storage and Archiving**

In the Electronic Document Management System (EDMS) process, the storage and archiving phase ensures the secure and reliable preservation of documents. This step involves digital storage, which facilitates immediate access to documents while safeguarding them on suitable media, and digital archiving, which prioritizes maintaining the integrity and authenticity of documents through mechanisms like electronic signatures or trusted third-party services to ensure long-term compliance and trustworthiness.

- **Distribution**

In the Electronic Document Management System (EDMS) process, the distribution phase focuses on making digital copies of documents accessible to authorized users through efficient tools. This includes utilizing "Scan to Mail" functionality to send documents directly via email and "Scan to Folder" capabilities to store documents in shared directories, ensuring seamless integration into the EDMS for easy access and collaboration.

3.6.The purpose of EDMS

At some point, every large organization will inevitably recognize the necessity of implementing an electronic document management system (EDMS) to effectively manage the growing volume and complexity of their diverse documents and drawings(Abbasova, 2020a). To ensure effective information management, enhance data security, and maximize the benefits of digital documents, Electronic Document Management (EDM) focuses on several fundamental objectives, including:

- Mastering and structuring the documentation process is crucial for effective management, requiring the organization of digital document lifecycles and ensuring version controlled, timely, and location-specific access.
- Facilitate access to and sharing of information while encouraging the pooling of documents and streamlining their distribution. This involves transitioning from individual document management to a collective and optimized system.
- Enhancing efficiency and productivity involves minimizing the time spent on document search and retrieval. This goal can be accomplished through the automation of document processes and the optimization of information flow, resulting in faster and more streamlined management.
- Optimizing the preservation and archiving of documents entails guaranteeing the traceability and integrity of archived records. It necessitates the establishment of retention rules in accordance with legal and organizational standards.

3.7. Benefits of EDMS

Organizations commonly implement Document Management Systems (DMS) to standardize access to information, enabling authorized users to efficiently find and retrieve documents. By building on this foundation, Electronic Document Management Systems (EDMS) further boost productivity through task simplification, enhanced security, and reliable data handling. They streamline workflows, saving time, improving efficiency, and ensuring robust document protection. Moreover, EDMS play a vital role in supporting compliance with quality standards, maintaining audit trails, and fostering accountability within the organization (Forcada Matheu & Casals Casanova, 2005).

- **Quality Improvement and Compliance**

➢ Enhanced Quality Control & Reduced Non-Conformities: Improved document workflows and information management reduce errors and optimize quality assurance resources.

➢ Lower Quality-Related Costs: Automating routine tasks allows employees to focus on strategic activities, cutting down on quality management expenses.

- **Operational Efficiency & Cost Reduction**

➢ Faster Time-to-Market: Streamlined collaboration and lifecycle management help speed up the launch of products and services.

➢ Reduced Operational Costs: Automation minimizes manual, repetitive tasks and errors, resulting in significant cost savings.

➢ Optimized Processing Times: Quicker document circulation improves decision-making and validation processes, even on mobile platforms.

- **Key Functional Benefits**(Mohammed & Ali, 2023)
  - ➢ Efficient document location and retrieval.
  - ➢ Unified management of documents and data across various systems and formats.
  - ➢ Integration of digital and paper-based document systems.
  - ➢ Control over access, distribution, and modifications of documents.
  - ➢ Tools for editing and marking up documents.

3.8. Limitations of EDMS

Despite the numerous advantages offered by Electronic Document Management Systems (EDMS), their implementation presents several challenges and limitations that organizations must consider:

- **Organizational Change and Adaptation**

The successful adoption of an EDMS requires substantial changes within the organization, including modifications to practices, systems, processes, and workflows. The development and communication of appropriate strategies and implementation plans are essential. However, securing stakeholder engagement, defining a clear strategy, selecting an appropriate system, and restructuring operational frameworks can be complex and resource-intensive.

- **Technological Advancements and Market Dynamics**

The rapid evolution of EDMS technologies necessitates continuous research and adaptation to new applications, vendors, and implementation methodologies. The process of evaluating, selecting, and integrating an EDMS is often challenging, with organizations required to address key considerations such as networking capabilities, software support, and implementation feasibility. Furthermore, financial aspects including initial investment costs, return on investment analysis, and cost justification must be carefully assessed.

- **Dependence on Digital Formats**

EDMS solutions require all documents, including letters, reports, databases, and drawings, to be in electronic format, either created digitally or converted from paper sources. This requirement extends to handwritten notes, sketches, large-scale maps, and complex drawings. Integrating EDMS with non-compatible legacy systems, particularly paper-based processes, can pose significant operational difficulties.

- **Challenges in Information Exchange**

In many EDMS solutions, information is structured at the level of entire documents or drawings rather than individual components. This limitation can hinder granular modifications and analysis, reducing the flexibility of data utilization within the system.

- **Constraints in Collaborative Work**

A common limitation of EDMS platforms is the lack of real-time collaboration features, preventing multiple users from concurrently editing the same document or design. This restriction can impede teamwork efficiency, particularly in fields requiring simultaneous contributions from multiple stakeholders(Forcada Matheu & Casals Casanova, 2005).

Electronic Document Management Systems (EDMS), despite their limitations, continue to be a vital asset for managing the growing intricacy of document workflows within organizations. By improving accessibility, fostering seamless collaboration, and automating routine tasks, they play a key role in driving productivity and lowering operational expenses, solidifying their value as indispensable tools for contemporary businesses.

4. Archiving

Archiving holds critical importance for organizations across various sectors. Acknowledging its relevance, both ISO 9001 and ISO 14641 underscore its significance. ISO 9001 emphasizes the necessity of effectively managing documented information within a Quality Management System, stipulating specific archival procedures. Conversely, ISO 14641 offers a comprehensive framework for archiving, with a particular focus on Electronic Document Management Systems.

4.1. Electronic archiving system

An electronic archiving system is defined as a systematically organized framework comprising processes, technologies, and controls, aimed at ensuring the preservation, integrity, authenticity, and accessibility of electronic records over the long term(*Iso-14641-2018_compress*, n.d.).

Electronic archiving system is a system designed for the systematic management and long-term preservation of electronic records, ensuring their authenticity, reliability, integrity, and usability over time (Ducharme, n.d.).

Its primary goal is to ensure the secure and long-term preservation of electronic documents for defined periods, sometimes extending over many years. A key feature of the Electronic Archiving System (EAS) is to guarantee the evidential value of documents by making them immutable once archived, preventing any modifications.

4.2. Electronic archiving

Electronic archiving refers to the process of preserving data in digital format on an electronic medium specifically designated for this purpose. This involves the dematerialization of information, either through conversion into digital data (for content originating from analog formats such as paper, film, or microfilm) or by transferring electronic data directly from existing digital formats (Michel Bolognesi,2010).

Electronic archiving refers to the preservation of documents and information in a dematerialized form. This includes various types of data such as emails, office files, and

databases. It also prominently encompasses physical and paper records, which must first be digitized.

4.3. Archive

A set of documents, whether created or received, regardless of their date, format, or storage medium, generated by any individual, organization, or public or private entity in the context of their activities(*Iso-14641-2018_compress*, n.d.).

4.4. ISO 14641

The NF Z 42-013 standard, titled "Specifications relating to the design and operation of computer systems to ensure the preservation and integrity of documents stored within these systems," has been internationally recognized and adopted as ISO 14641. This standard establishes precise requirements for safeguarding the preservation and ensuring the integrity of documents within electronic systems. The standard is fundamentally technical in scope, concentrating on the underlying IT infrastructure required for digital archiving. It mandates thorough traceability for all processes, including document digitization, timestamping, and communication, while enforcing strict security and access control measures. In addition, the standard specifies contractual requirements for engaging third-party archiving services. Its primary objective is to ensure the integrity of archived documents by necessitating continuous monitoring and meticulous documentation of any modifications within the system. Overall, it offers a comprehensive framework of principles and technical guidelines designed to maintain the highest standards of security and document integrity.

4.5.The objectives of electronic archiving

The objectives of electronic storage are diverse and are meticulously engineered to ensure the security, reliability, and proper management of digital information, as well as the integrity of digital exchanges and archival practices.

- Access to archived documents is exclusively restricted to individuals with proper authorization.
- Ensures compliance with legal retention requirements through secure storage.
- Data integrity is preserved, with modifications either restricted or fully traceable.
- Authenticity by knowing who created the document and when.

- Documents are readily available and easily accessible as needed (Jennifer Montérémal,2021).

4.6. The operational process of electronic archiving

The electronic archiving process involves systematically converting paper documents into digital formats through the following stages:

Document Preparation: Documents are collected and categorized based on format, size, or colour, ensuring duplicates are excluded. Enhancements are applied to unclear documents using tools such as Photoshop. Staples are removed, documents are grouped according to shared attributes, labelled for identification, and encoded for seamless scanning.

Scanning: Dedicated scanners and specialized systems are used to digitize paper documents, generating high-quality images. Adjustments for lighting, colour accuracy, and clarity are made to optimize image quality before storing files within an integrated digital system.

Quality Control: Digital images are systematically reviewed and compared against the original documents to ensure accuracy. If content defects or imaging inconsistencies are detected, documents are re-scanned to maintain quality standards.

Indexing: Metadata entry is performed to systematically organize digital documents within a database. Indexing may be based on physical attributes, descriptive elements, or barcode integration. Documents are linked to related files via hypertext or database connections to facilitate research and workflow efficiency.

Document Return: Physical documents are reassembled and returned to their original locations after processing, with re-stapling performed as needed.

Storage: Digital files are securely saved on various storage media, including computer memory, magnetic disks, optical disks, or centralized systems. Backup protocols are implemented to safeguard data integrity and long-term preservation(*EUROPEAN ACADEMIC RESEARCH, VOL*, 2017).

4.7. The characteristics of electronic archiving system

An Electronic Archiving System (EAS) must comply with current standards and frameworks, within a continuously evolving regulatory environment. These standards are divided into two main categories: conceptual standards and operational standards. The system's functional features are crucial to ensure effective management, enabling the collection, administration, and preservation of information for future consultation, while ensuring its reliability. The system should be characterized by:

- **Longevity**

Ensuring the readability and accessibility of documents over an extended period, regardless of technological changes or obsolescence.it guarantees that documents remain usable and legible for future reference, which is critical for compliance, audits, and historical records in quality management systems (QMS).

- **Integrity**

Ensuring the authenticity and unaltered state of a document, meaning its content and form remain unchanged since creation or last authorized modification.it confirms that a document is trustworthy and can be relied upon as evidence in audits, legal proceedings, or quality reviews.

- **Confidentiality**

Controlling access to information to ensure that only authorized individuals or systems can view or interact with sensitive documents.it protects sensitive information from unauthorized disclosure, maintaining privacy and compliance with data protection regulations.

- **Traceability**

Maintaining a comprehensive record of a document's lifecycle, from creation to archiving, including all actions, modifications, and accesses.it provides an auditable history of a document, enabling organizations to demonstrate compliance, investigate issues, or reconstruct events.

- **Security**

Protecting documents to ensure their long-term preservation and restricting their dissemination in accordance with applicable laws and regulations.it safeguards documents against loss, damage, or unauthorized disclosure while ensuring compliance with legal and regulatory requirements(*Olivier DUCROCQ 2022*, n.d.).

4.8. The difference between document and record

The primary distinction between a document and a record lies in their purpose and handling. A document serves as a single valid version detailing plans for task execution, such as policies or procedures. It is updated by creating new versions, ensuring alignment with ISO 9001's requirement for "maintained" information. On the other hand, a record captures data to provide evidence of an event or action at a specific point in time, such as audit reports or meeting minutes. Unlike documents, records remain unchanged, and new records are created to reflect new data without invalidating previous ones. Multiple records can exist simultaneously and are often reviewed collectively.

The Electronic Document Management System (EDMS) enhances operational efficiency, strengthens security measures, and ensures compliance by digitizing and structuring document lifecycles. It addresses the limitations of traditional document management while improving accessibility and automating workflows. Although challenges such as organizational adaptation and technological integration exist, the EDMS remains indispensable for contemporary businesses.

Quality Management Systems (QMS), governed by ISO 9001 standards, promote consistency and regulatory adherence through structured documentation. Concurrently, electronic archiving, in accordance with ISO 14641, ensures the long-term preservation and integrity of digital records. Together, EDMS, QMS, and electronic archiving form a cohesive framework for effective document governance, regulatory compliance, and seamless digital transformation.

Conclusion

By the end of this chapter, readers will gain a clear and thorough understanding of key concepts, including quality management, documentation, electronic document management

systems, and archiving, with a focus on electronic archiving. These topics and concepts will be explained at a high level for easy comprehension. Additionally, a detailed literature review will be provided, summarizing previous studies and works related to this subject.

CHAPTER III:

METHODOLOGICAL FRAMEWORK

Chapter III: Methodological framework

This chapter aims to provide a comprehensive overview of the methodological framework employed in our study, detailing the methodological approach adopted, the rationale behind its selection, and its implementation. Additionally, it outlines the various data collection methods utilized throughout the research process, identifies the individuals

1) Research approach

in this research study, it was important to follow a clear method to achieve useful and effective results. A **qualitative approach** based on action study was chosen, as it helps explore and describe situations in a detailed and meaningful way using non-numerical data. This type of research provides a deeper understanding of a specific context or problem, especially in real work environments, and can help managers see what actions are needed (Oranga & Matere, 2023). Qualitative research is also useful for collecting specific information about people's behaviours, values, opinions, and social situations. It focuses on the human side of a topic, including emotions, beliefs, and relationships, rather than just numbers or statistics (Tscholl et al., 2019).

Qualitative approach

Qualitative research is a method that delves into real-world issues to gain deeper understanding. Unlike quantitative research, which focuses on numerical data or experimental interventions, qualitative research generates hypotheses to explore and interpret quantitative findings. It captures participants' experiences, perceptions, and behaviours, addressing the "how" and "why" rather than the "how many" or "how much" (Steven Tenny; Janelle M. Brannan; Grace D. Brannan, 2022).

2) Data collection

To explore how a company can achieve effective and secure document management through an electronic archiving system and to address the research problem while fulfilling the outlined objectives a comprehensive qualitative data collection process was carried out. This process incorporated a variety of complementary methods and techniques to ensure both the reliability and depth of the findings. Specifically, the study employed direct observation to capture authentic workflows and practices, conducted interviews with key stakeholders such as employees and managers to gather diverse perspectives, and performed thorough document analysis to evaluate existing archiving practices and their compliance with standards. The

triangulation of these methods not only enhanced the credibility of the data but also provided a holistic understanding of the challenges and opportunities in implementing a secure and efficient electronic archiving system. Qualitative data collection methods primarily aim to gather textual data suitable for research and analysis.

2.1) Interviews

Qualitative research interviews have long been a fundamental technique in qualitative research, serving either as a primary means of data collection or as a complement to broader research efforts. These interviews typically involve a one-on-one interaction between a researcher and a participant, conducted in person, over the phone, or via video call. As a method grounded in asking questions to gather data, interviews generally include two or more individuals most commonly, an interviewer and a respondent (Tegan George, 2022). Researchers identify three main types of interviews, each designed for a specific purpose. However, this study concentrates on only one main type which is semi-structured interviews.

- **Semi-Structured Interviews**

Semi-structured interviews are the most widely used form of qualitative research interviews, offering a balance between the structure of standardized questioning and the flexibility of open dialogue. This method blends the informal, conversational nature of unstructured interviews with the consistency and comparability of structured ones. While the researcher enters the interview with a prepared set of questions and topics, they are not bound to follow a strict wording or order. This allows for greater adaptability and responsiveness during the conversation, making it ideal for exploring complex or sensitive topics in depth. A semi-structured interview aims to gain a deeper understanding of the participant's thoughts, emotions, and beliefs on specific issues. Although questions are planned in advance, the interviewer has the freedom to skip redundant questions, reorder them, or introduce new ones as needed. Follow-up questions and probing for additional detail are also common and encouraged. The ability to observe and respond to both verbal and non-verbal cues in real time enables the interviewer to tailor their approach to each participant. Ultimately, the goal is to foster a natural, open dialogue while remaining focused on the core themes of the research (Dovetail Editorial Team, 2023).

The interviews were conducted with three company employees: the quality manager, the IT manager, and the database manager. These interviews took place in an appropriate

environment and under suitable conditions. For further details, refer to the accompanying table:

Table 1: persons intervewed informations

Persons	Poste	Date	Duration	Place
H.K	IT Manager	28/04/2025	15 minutes	IT manager office "Maghreb Lampe"
N.L	Quality manager	28/04/2025	10 MINUTES	Meeting room" Maghreb Lampe"
A.S	Database manager	29/04/2025	10 MINUTES	Database manager office "Maghreb Lampe"

Source: elaborated by the author according to the interviews data

2.2) Observation

Qualitative observation is a subjective research method that involves describing phenomena based on what the researcher sees, hears, smells, tastes, or feels, without using quantitative data. It relies on the researcher's five senses to gather rich, detailed insights into people, behaviours, and environments in their natural settings. This approach helps in understanding processes, cultures, or individuals more deeply (Tegan George, 2023). we can distinguish several types of observation, but we only rely on the direct observation type.

- **Direct observation:**

Direct observation, also known as an observational study, is a data collection method where the researcher watches the subject in their natural setting without any intervention or manipulation of that environment. This approach enables the gathering of genuine, real-time information about behaviours, interactions, or processes exactly as they unfold.

Observation is a commonly used method in qualitative studies, enabling the collection of verbals and, above all, non-verbal data. This technique facilitates the analysis of a phenomenon by describing observed behaviours, situations, and facts. (Gaspard claude,2019).

In this study, we conducted comprehensive tours throughout the company to assess the work environment, observe interdepartmental interactions, and evaluate the utilization of the electronic archiving system. Our focus was to determine whether all departments actively use

the system, assess their satisfaction with its functionality, and identify any challenges or inefficiencies they encounter in document management processes.

Data analysis

To gain an in-depth understanding of the company's document management practices, the study employed a combination of direct observation and semi-structured interviews as complementary qualitative research methods.

The direct observation was conducted over three consecutive days within the company premises. It began with a focused review of the existing archiving procedures in collaboration with the Information Technology (IT) department. During this phase, the IT Manager offered a detailed explanation of the current methods and tools used for preserving and securing documents, including access control, backup systems, and storage protocols. This stage allowed for the identification of strengths and limitations in the current system.

The second phase involved observing how various operational departments interact with the information management system. Special attention was given to how documents are created, stored, accessed, and shared, as well as to employee compliance with established procedures. Observations also explored staff behaviour, challenges faced in document handling, and their perceptions of the system's efficiency and reliability. The final phase consisted of a guided tour of the IT department led by the IT Manager, allowing for real-time evaluation of technical practices, employee involvement, and the overall workflow related to document management. This approach enabled a holistic view of the company's archiving practices and helped identify potential areas for digital improvement.

In parallel, semi-structured interviews were conducted with key personnel, including the Quality Manager, IT Manager, and Database Manager. These one-on-one interviews were held in a quiet and private setting within the organization to ensure participants could express their views comfortably and without external influence. Each interview lasted approximately 10 to 15 minutes and followed a pre-established guide to maintain consistency and relevance across all sessions.

The interview guide was divided into two main parts: the first focused on evaluating the current state of document preservation—covering aspects such as classification, traceability, storage formats, and retention policies. The second part explored employee engagement,

technical readiness, and openness to change regarding the potential implementation of a new electronic archiving system. These discussions provided nuanced insights into employees' roles, their familiarity with digital tools, and their willingness to adopt technological upgrades to improve efficiency, traceability, and compliance with quality standards.

Together, the observation and interviews offered a comprehensive, multidimensional view of the company's document management system, identifying both operational gaps and opportunities for the successful integration of an enhanced electronic archiving solution.

Conclusion

This chapter provides a comprehensive explanation of the research methods and data collection techniques employed in our study, detailing each method's purpose, objectives, and application. It covers the qualitative approaches, such as direct observation and semi-structured interviews, used to gather insights from key stakeholders like the quality manager, IT manager, and database manager at Maghreb Lampe. By elaborating on the rationale for selecting these methods and their implementation, the chapter establishes a robust methodological framework. This framework clearly outlines the systematic steps followed throughout the research process, ensuring transparency and coherence in our investigation of the electronic archiving system's integration and impact.

CHAPTER IV:

RESULTS AND DISCUSSION

In this chapter, we present the results obtained from our data collection process, which involved conducting targeted interviews with relevant stakeholders and analysing their responses to address our research question and assess the company's condition before and after implementing an electronic archiving system. The chapter is divided into three main sections: the first section analyses and discusses the collected data, while the second section introduces the new archiving system, detailing its functionalities and the benefits it has brought to the company. The last one presents a discussion about the results of the study.

Section 01: analysis and interpretation of data collected

Adopting a qualitative approach, our research utilized semi-structured interviews with relevant employees at Maghreb Lampe Company. After thoroughly examining and discussing our topic, we will now present the findings derived from this process. As previously stated, multiple key methods were employed in the data-gathering process. This section will systematically analyse each method individually (observation, interviews) and present the corresponding results obtained, ensuring a comprehensive evaluation of the findings.

- **observation**

The company tour was conducted over multiple days and sessions. The first tour, led by the quality manager, provided an overview of the company’s core business, structure, processes, and departmental interactions. The second tour focused on the IT department, starting at the IT manager’s office to review their processes, tasks, and document management across the company. The final tour took place in the Database manager office, where documents are processed, stored, and updated, ensuring proper folder management and tracking of changes. These observations clarified the company’s operations, processes, interdepartmental interactions, and overall vision.

Through our observations, we identified a significant lack of interaction among employees, coupled with a limited awareness of the importance of effective document management. Visits to various departments revealed a shared dissatisfaction with the current archiving system, which fails to support employees and has led to widespread disappointment. The ineffective archiving system has reduced inter-process collaboration, as departments tend to retain their documents independently, lacking a centralized platform for sharing.

- **Semi-structured interviews**

We interrogated all the three members using the same questions but gives them the opportunity to talk freely they were not limited in answering or expressing their opinions. Thus, after finishing the interviews, the answers were well analysed and structured in order to organize their ideas.

After the analysing process we have found that all the three agree on some points presented in the table below:

Table 2: Interview analysis according to the study axes and the answers of the interviewees

Axes / Interviewees	**Evaluation of actual EAS**	**Employee's engagement**
Interviewee 01 **"Quality manager"**	The actual archiving system is not effective and needs a lot of improvements.	Expresses their enthusiasm and support the implementation of electronic archiving system with all its costs.
Interviewee 02 **"Information Technology manager"**	Expresses dissatisfaction with the current system's performance and disappointment in its functionality, noting that it is incomplete and fails to serve as an effective archiving solution.	She views the integration of new archiving software as a valuable opportunity for the company to enhance its operations and improve efficiency. .
Interviewee 03 **"Database manager"**	Expresses dissatisfaction with the current system, highlighting that its challenges and difficulties are unmanageable and troubling.	Actively engaged and views the implementation of a new archiving system as crucial to the company's success and organizational efficiency.

Source: elaborated by the writer according to the results of interviews made

The table summarizes interview results with company employees, based on two study axes: evaluation of the current electronic archiving system and employee engagement, using an interview guide with questions tied to these axes.

The first interviewee criticizes the current archiving system as ineffective, requiring significant improvements and modifications. They note it fails to meet standards like ISO

9001:2015, lacks structure and organization, and does not include all company documents, making it a vulnerability for the organization. They advocate for a new electronic archiving system that adheres to standards and possesses the essential features of a proper system. The second interviewee expresses discontent with the system's functionality, highlighting its incompleteness and time-consuming nature. They add that it requires constant oversight, is difficult for other employees to use effectively, and presents numerous challenges. The IT manager views adopting new archiving software as a significant opportunity to enhance organizational compliance and efficiency. The final interviewee expresses disappointment, stating that the system's unmanageable problems and challenges are unacceptable. However, they strongly support implementing a new archiving system, seeing it as a valuable opportunity to improve organizational efficiency and confidentiality by securely protecting and preserving documents.

Analysing their responses, all interviewees share common views, differing only in their arguments. They unanimously express frustration with the current archiving system, citing its inefficiencies and failure to meet standards, and agree it requires substantial improvements. Regarding employee engagement, all three-show enthusiasm for adopting a new system that meets workers' needs and expectations, emphasizing usability and accessibility for all employees. In conclusion, organizations must implement an effective archiving system to ensure optimal performance and support their workforce.

Section 02: integrating the electronic archiving system

In this section we will provide the reasons why does this company needs to develop a new system for documents preservation. Moreover, this part is about explaining how this system works and how it has improved the work of the company.

1. Reasons of choosing to install a new system

The targeted company used to archive its documents in a shared document between some individuals only so it wanted to change this method and improve it. For that reason, we proposed to integrate an electronic system that facilitates the process. There are also other reasons of this operation such as:

- Not all documents are preserved and archived.
- Not all employees are allowed to upload or modify documents.
- The access is for everyone so there is no specialisations and privacy.
- The management documents are not archived in the file and that is a serious issue.
- Traceability is something essential that is why a secured system should be uploaded.

2. Electronic archiving system

ISO 14641 is structured into two main components: hardware and software. The hardware refers to the servers and machines involved in electronic archiving operations, while the software encompasses the systems or platforms used for document storage and management.

In our case, the implementation of an archiving system was designed to fully comply with the requirements outlined in Clause 7.5.3 of ISO 9001, which defines the essential characteristics archiving system must possess. The decision to integrate this system was a collective effort, involving all employees to ensure its effectiveness and alignment with organizational needs. To proceed with its installation, an external IT specialist with expertise in the field was required. Additionally, ISORA members and I collaborated to develop a reliable and efficient archiving system. While enterprise resource planning (ERP) systems can serve as archiving tools, our objective was to establish a dedicated web-based platform that streamlines and enhances document management.

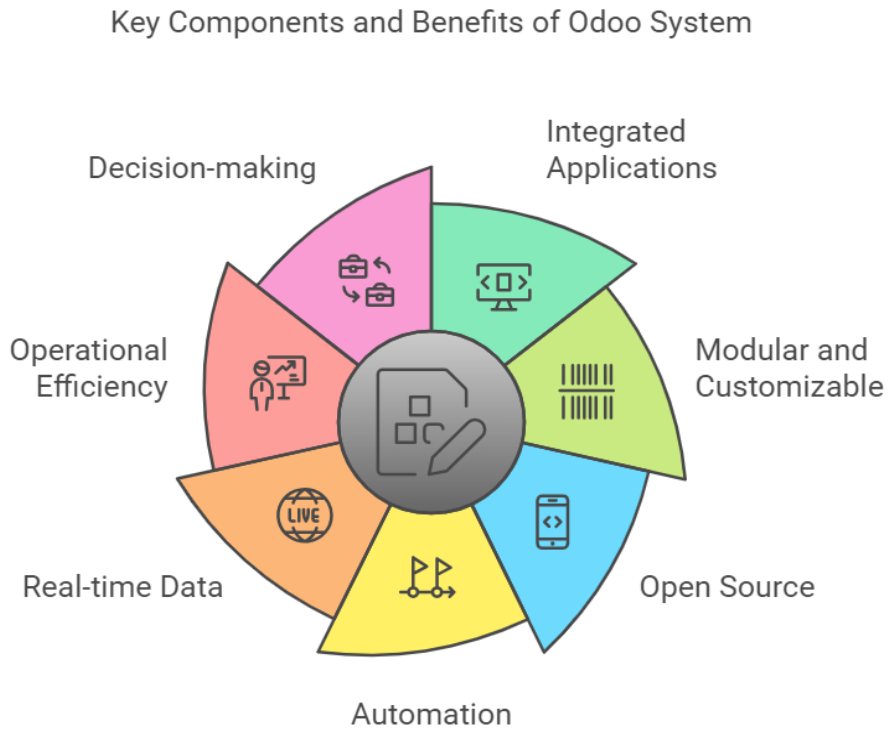
3. Odoo system

Odoo is open-source ERP software that helps businesses manage different tasks, such as inventory, accounting, human resources, and sales. It was first called Open ERP but later became a complete business solution used by companies of all sizes. Its key strengths are flexibility, a modular design, and the ability to fit the needs of different industries (Prashant Gosai,2024).

- **The reasons of choosing Odoo system**

The Odoo system is an adaptable and user-friendly business management solution that offers integrated applications for essential functions like accounting, sales, and human resources. Its modular structure allows businesses to customize it according to their specific requirements, ensuring flexibility and scalability. As an open-source platform, it is cost-effective and supports automation, enabling real-time data processing to enhance operational efficiency and informed decision-making (Mohammed Alsayed,2024). The picture below summarizes all the key components and benefits of Odoo system mentioned earlier.

Figure 2:key components and benefits of Odoo system



Source : https://www.walnutit.com/blog/walnut-1/why-odoo-system-9 (consulted in may 1, 2025)

- **The working mechanism of Odoo**

Our purpose in integrating this system is to organize things and preserve traceability and proofs for the company. Odoo works with a secured method. The system needs an email and a password to get into it and can use it. After entering to the system, you will find the applications and the processes you are having access to and can see the documents related to these processes as it is shown in the picture below.

Figure 3: background of Odoo system applications

Source : [https://www.cybrosys.com/blog/significant-features-of-odoo-16-website-module (consulted in may 2,2025)](https://www.cybrosys.com/blog/significant-features-of-odoo-16-website-module)

Every user has the ability to upload or download documents and records via the platform, with the system providing access controls to regulate who can view, modify, or delete documents. Users are restricted to interacting only with documents they are authorized to access, which is a key strength of the system, enhancing document security.

The system imposes no storage limits, as its capacity depends on the connected server. In the realm of quality management, document management is critical, which is why ISO 9001:2015

dedicates an entire chapter to documented information. This chapter outlines how to manage various types of information, control documented information, and address its sensitivity, as effective document management ensures traceability and evidence of all organizational activities.

In the Odoo system, all employees can access the platform, not just the IT team, enabling use from any location, at any time, and on any device. While the IT team retains system oversight, their workload has significantly decreased. Another advantage is the system's ability to store all types of documents and records, including audio files, unlike the previous system, which archived only a limited range of documents.

- **Odoo use and function for the conception process**

To gain a deeper understanding of the Odoo system's functionality, we selected the conception process for analysis. This process is highly sensitive, encompassing multiple phases, each requiring approval from specific managers and individuals within the company.

At Maghreb Lampe, the conception process involves designing the company's products and create new product ideas, such as lamps, LEDs, and sockets. This process includes several phases, each one necessities approval from designated processes until completion. The Odoo system facilitates this by granting access to relevant processes for each phase.

The product conception process at Maghreb Lampe is a structured, multi-phase workflow designed to ensure innovative, high-quality, and market-relevant products while maintaining confidentiality and preserving the company's legacy. Below is an overview of the distinct phases involved:

Phase 1: Ideation and Design

In the initial phase, the design team collaborates to conceptualize innovative product ideas tailored to market demands, often inspired by trends in the employment sector or dominant products in the job market. The goal is to create designs that enhance the company's portfolio while aligning with its brand identity. The output is a finalized design proposal ready for further evaluation.

Phase 2: Maintenance Feasibility Assessment

The finalized design is submitted to the maintenance team, which evaluates its manufacturability by assessing machine capabilities and material availability. During this phase, access to the design within the Odoo system is restricted to authorized maintenance personnel for decision-making. If approved, the design progresses to the next phase. If not, it is returned to the design team with feedback and recommendations for revision, restarting the ideation process.

Phase 3: Production Feasibility and Execution

Upon maintenance approval, the design advances to the production team, which assesses whether the production environment and resources are suitable for manufacturing the product as specified. Access to the design is limited to production team members during this evaluation. If the production team approves, manufacturing begins, marking the transition to active production.

Phase 4: Quality Control

Once production is complete, the finished product undergoes rigorous quality control to verify that it meets the specified standards and is free of defects. If the product passes inspection without issues, it proceeds to the final phase. Any discrepancies trigger corrective actions, which may involve revisiting earlier phases.

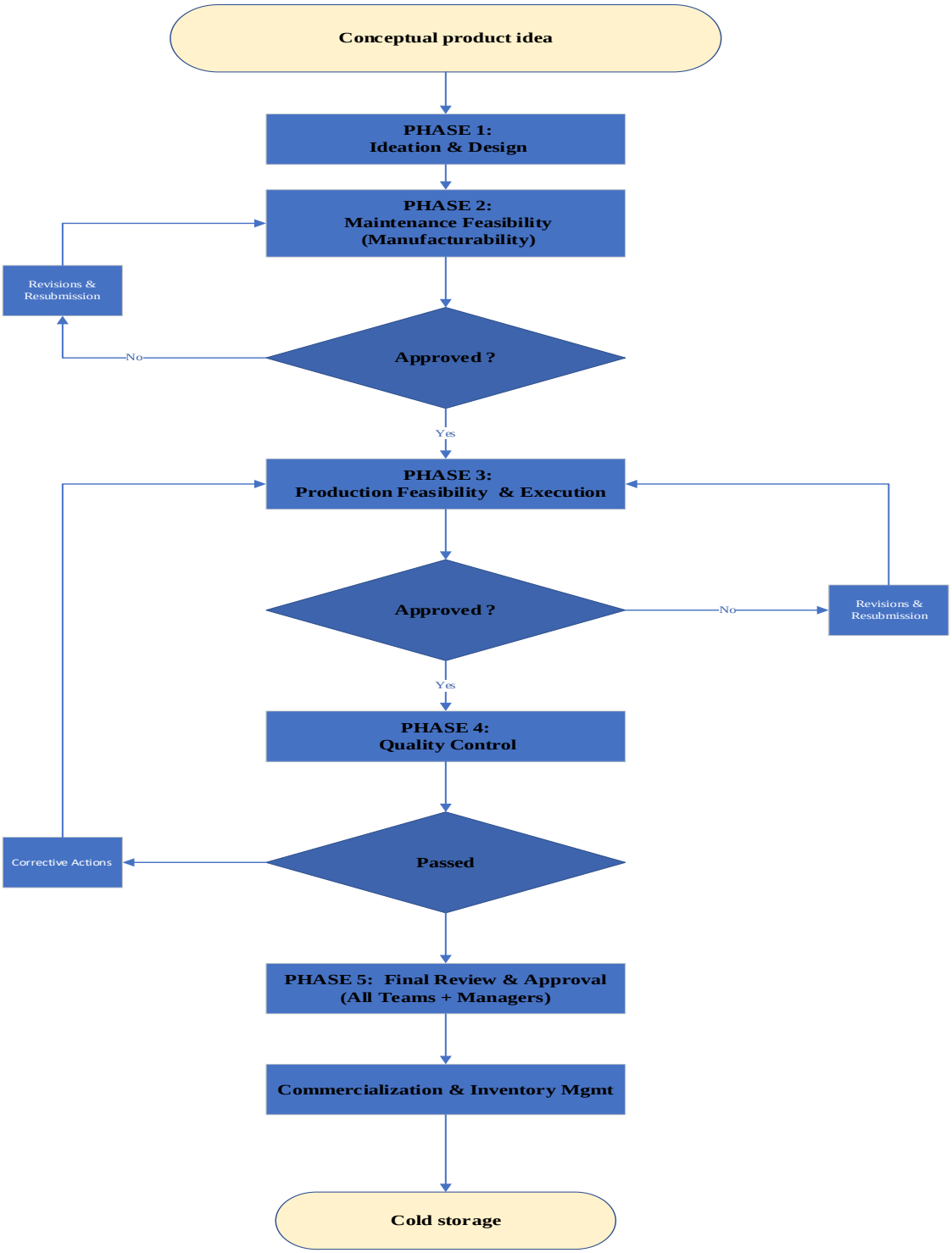
Phase 5: Final Review and Approval

In the concluding phase, all relevant teams (design, maintenance, production, and quality control) provide feedback on the product. Any identified issues prompt a comprehensive review to ensure resolution. Managers across departments must grant final approval before the product advances to subsequent processes, such as commercialization and inventory management.

The conception process is highly sensitive, requiring strict confidentiality to safeguard the company’s proprietary designs, which embody its identity and heritage. Robust access controls and secure documentation practices are enforced to protect intellectual property and maintain historical records for future reference.

This meticulous, collaborative process ensures that Maghreb Lampe delivers innovative, high-quality products that align with market needs while upholding the company's legacy and operational standards. All the previous phases are summarized in the following figure:

Figure 3: the conception process flowchart



Source: elaborated by the author

- **The link between quality management system and archiving system**

One of the secondaries objectives of this research is about highlighting the relationship and the link be

tween quality management system and electronic archiving system. The implementation of our electronic archiving system has yielded significant benefits that directly align with key principles of a Quality Management System. Firstly, it fosters enhanced personal implication by empowering every employee to archive their documents independently and effortlessly, reducing reliance on the IT department. This promotes ownership and responsibility.

Secondly, the system strongly supports evidence-based decision making, a cornerstone of any robust QMS. By ensuring comprehensive traceability and readily available proof for all internal operations, the electronic archive provides the reliable data necessary for informed choices.

Finally, the archiving system inherently contributes to continuous improvement, the fundamental principle driving quality management. By streamlining document management, enhancing accessibility, and ensuring data integrity, it lays the groundwork for ongoing efficiency gains and operational excellence. While numerous other synergies exist, these key areas underscore the powerful alignment between our archiving solution and the core tenets of a QMS.

Section 03: Discussion

The investigation into the document archiving practices at Maghreb Lampe, as detailed in the first passage, and the insights from the literature review in the second passage provide complementary perspectives on the adoption of electronic archiving systems within the framework of Quality Management Systems (QMS) and ISO 9001:2015. By comparing the practical, organization-specific results from the research with the theoretical and global findings from the literature, this discussion highlights their alignment, differences, and combined contributions to understanding the role of electronic archiving in enhancing organizational efficiency, compliance, and quality management, particularly in the context of Algerian companies. The analysis focuses on four key areas: the need for improved archiving systems, the benefits of electronic archiving, the challenges encountered, and the role of employee engagement and organizational readiness. Together, these insights underscore the necessity of transitioning to a standardized electronic archiving system at Maghreb Lampe and offer a roadmap for implementation that aligns with QMS principles.

The first passage reveals a critical need for an enhanced archiving system at Maghreb Lampe, driven by the inefficiencies of the current shared folder system, which lacks structure, security, and comprehensive document coverage. Direct observations and interviews with key personnel (IT Manager, Database Manager, and Quality Manager) uncovered operational challenges, such as the absence of blank forms, incomplete document sets, and unrestricted access, leading to employee dissatisfaction and delays. These findings align with the literature's broader recognition of the inadequacies of traditional or unstructured archiving systems. For instance, (maria, n.d.) note that ineffective archive management results in disorganized document stacks, hindering retrieval, while(Guyon, 2020) addresses the instability of digital objects, which parallels the lack of traceability in Maghreb Lampe's system. However, the research's focus on a specific Algerian company provides a practical case study that grounds the literature's theoretical concerns in real-world operational realities. The literature's emphasis on proactive management from document creation.(Saad et al., 2022).The use of digital technology has disrupted several disciplines including archival science and almost all related professions, mainly that of the archivist. This situation leads to a review of the technical and regulatory aspects of archiving and their adaptation to the digital environment. Our work is based on the methodology of research and documentary analysis with the aim of examining how digital technology is revolutionizing archiving and this

through the questioning of the topicality and relevance of certain concepts and principles of archiving. In this sense, we have studied the object of archiving to better understand it and analyse the life cycle of digital documents and data in order to verify its relevance in a digital universe and multi-infrastructure systems(Belin & Rietsch, 2016)offers potential solutions to address Maghreb Lampe's challenges, such as implementing version control and role-based access to enhance security and efficiency.

The benefits of adopting an electronic archiving system are a central theme in both the research and the literature, with significant overlap in their findings. The research highlights practical advantages, including reduced time, space, costs, and effort, as well as enhanced competitiveness and streamlined document management across departments. These align closely with QMS principles, particularly continuous improvement and evidence-based decision making, as the proposed system would ensure traceability and comprehensive storage. Similarly, the literature underscores efficiency gains, such as rapid retrieval and dissemination of information(Al-Azawi, 2012), and long-term preservation of authenticity and integrity (Guyon, 2020). The literature further enriches these benefits by addressing governance and risk mitigation, with(Belin & Rietsch, 2016) proposing multi-infrastructure systems to optimize resources and (Bachoué Pedrouzo, 2014) advocating for legal reforms to support digital archiving. While the research focuses on immediate operational improvements at Maghreb Lampe, the literature's global perspective provides a framework for ensuring the sustainability of these benefits through robust technical and legal systems. This synergy suggests that Maghreb Lampe's proposed system could incorporate metadata frameworks and governance policies from the literature to achieve both short-term efficiency and long-term compliance.

Challenges in implementing electronic archiving systems are another point of convergence, though the research and literature approach them from different angles. At Maghreb Lampe, the research identifies practical issues, such as low employee awareness of archiving practices, the absence of blank forms, and security risks due to unrestricted access. These operational challenges reflect the literature's broader concerns about managing digital archives effectively. For example, Guyon (2020) discusses the instability of born-digital objects, which could exacerbate the traceability issues at Maghreb Lampe, while Demoulin and Vernessa (2015) highlight technological dependence as a risk, potentially relevant to the company's reliance on a single shared folder. The literature's solutions, such as metadata

frameworks for traceability (Guyon, 2020) and multi-infrastructure systems for risk sharing (Belin & Rietsch, 2016), directly address the research's challenges by offering technical and strategic approaches to enhance security, access control, and searchability. Additionally, the literature's focus on legal and governance issues (Bachoué Pedrouzo, 2014) provides a macro-level perspective that could guide Maghreb Lampe in navigating regulatory compliance, a concern not explicitly addressed in the research but critical for ISO 9001:2015 alignment. Together, these insights suggest that a successful system at Maghreb Lampe must balance user-friendly design with robust technical and legal frameworks to overcome both practical and systemic challenges.

Employee engagement and organizational readiness represent a unique contribution of the research, which the literature complements indirectly. The research finds strong employee enthusiasm for a new electronic archiving system, despite limited awareness of current practices, indicating a readiness for change that aligns with the QMS principle of engagement of people. Interviews reveal a desire for a user-friendly system that empowers employees to manage documents independently, reducing reliance on IT support. The literature, while not directly addressing employee perspectives, emphasizes the need for collaboration among legal, archival, and technical professionals (Demoulin & Vernessa, 2015) and well-defined archival policies (Belin & Rietsch, 2016). This suggests that Maghreb Lampe could leverage employee support by involving cross-functional teams in system design and implementation, ensuring alignment with the literature's call for collaborative governance. The research's human-centric focus fills a gap in the literature, which prioritizes technical and legal aspects, while the literature's structural recommendations provide a framework to sustain employee engagement through robust policies and infrastructure. This combination highlights the potential for a holistic approach at Maghreb Lampe, where employee buy-in drives adoption, and technical-legal systems ensure long-term success.

In synthesizing these findings, the research and literature together underscore the transformative potential of electronic archiving systems in enhancing QMS principles, particularly in the Algerian context. The research provides a localized, employee-driven case study that validates the literature's call for advanced archiving systems, demonstrating practical inefficiencies and readiness for change at Maghreb Lampe. The literature, in turn, offers a theoretical and global perspective, with solutions like the records continuum model (Saad et al., 2022), metadata frameworks (Guyon, 2020), and multi-infrastructure systems

(Belin & Rietsch, 2016) that could enhance the proposed system's design and sustainability. For Maghreb Lampe, this synergy suggests a roadmap for implementation: a user-friendly, ISO 9001:2015-aligned system that incorporates version control, access restrictions, and comprehensive storage to address operational challenges, while adopting metadata and governance frameworks to ensure authenticity, integrity, and compliance. The research's focus on Algerian companies fills a regional gap in the literature, where such studies are less common, contributing valuable insights into local archiving practices. Conversely, the literature's global best practices provide a foundation for Maghreb Lampe to adopt a system that is both contextually relevant and internationally competitive.

The implications of this comparison extend beyond Maghreb Lampe to other Algerian organizations seeking to align archiving practices with QMS standards. The research's findings on employee enthusiasm and operational inefficiencies highlight the urgency of transitioning to electronic archiving systems, particularly in contexts with limited digital infrastructure. The literature's emphasis on governance, risk management, and long-term preservation offers a strategic guide for ensuring these systems are sustainable and compliant with global standards. By combining the research's practical insights with the literature's theoretical framework, organizations can develop archiving systems that enhance efficiency, support QMS principles like continuous improvement and evidence-based decision making, and strengthen competitive positioning. Future research could explore the implementation phase at Maghreb Lampe, assessing how employee engagement and literature-recommended features impact system success, further bridging the gap between practical and theoretical perspectives on electronic archiving.

Conclusion

In this chapter, we sought to clarify the operational framework of the "Odoo" electronic archiving system, providing an in-depth exploration of its features, benefits, structure, and practical application within the organization. To facilitate a clearer understanding, we focused on a specific process the conception process at Maghreb Lampe to demonstrate how Odoo manages sensitive workflows, controls access, and ensures document security across multiple phases. Additionally, we presented the results of our data analysis, conducted through a qualitative approach that utilized direct observation during company tours and semi-structured interviews with key stakeholders, including IT personnel and managers. These methods allowed us to capture detailed insights into the system's impact and employee perceptions.

The findings underscore that adopting an electronic archiving system like Odoo is indispensable for companies to securely, efficiently, and systematically manage their documents.

GENERAL CONCLUSION

This research aims to enhance electronic archiving practices and emphasizes the importance of implementing an electronic archiving system in accordance with the ISO 14641 standard. It also seeks to demonstrate the interconnection between quality management systems and electronic archiving systems, illustrating that quality is a fundamental principle that should be integrated across all domains. During an internship at ISORA Consulting, the opportunity arose to develop an effective electronic archiving system to address a critical issue at Maghreb Lampe, which posed risks of significant losses and damages to the company.

To address this issue, a qualitative approach was employed, utilizing direct observations and semi-structured interviews with select employees at Maghreb Lampe. These methods were chosen to gain insight into the company's existing system, assess employee satisfaction, identify challenges they faced, and evaluate their agreement with the current system. Additionally, the study explored the employees' readiness and interest in adopting a new archiving system, as well as their willingness to enhance their skills and knowledge in this area.

The research framework is structured around three interrelated aspects that are inseparable in this context. The first aspect is the quality management system, aligned with the ISO 9001:2015 standard, which holds significant importance and must be adhered to diligently. The second aspect is the electronic document management system, a vital tool that requires careful consideration for effective document handling. Within this system, controlled documented information is a critical element that demands precise management due to its sensitivity and necessity. The third aspect is the electronic archiving system, which emerges as the culmination of integrating the quality management and electronic document management systems.

The results of this study show that adopting an electronic archiving system, such as the Odoo platform, improves employee involvement and simplifies task management. It clearly assigns responsibilities to the right individuals, ensuring that, as outlined in ISO 9001:2015, only authorized personnel can access, modify, add, remove, or download documents relevant to their roles.

Limitations and challenges

During our research, we encountered several challenges. Firstly, there was a lack of understanding among staff and management about the importance of effective document management, which limited enthusiasm for adopting new systems. Secondly, there was

significant resistance to change, as employees and stakeholders preferred to stay within their familiar routines and were hesitant to adopt unfamiliar digital processes. Additionally, the project was perceived as costly, leading to reluctance to allocate budget resources for implementing an electronic archiving system, despite its long-term benefits for efficiency and compliance.

Recommendations

It is essential to educate employees about the value of electronic archiving systems and effective document management. This involves raising awareness of how these systems enhance efficiency, ensure compliance with standards like ISO 9001:2015, and safeguard critical organizational records. By providing clear information and training, employees can better understand the benefits, such as streamlined processes, improved document security, and reduced risk of data loss, encouraging their support and engagement in the transition to digital solutions.

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ANNEXES

ANNEX01:

INTERVIEW GUIDE

I am Amira ALLAOUAT, a Master's student in Quality Management at the Higher National School of Management. The purpose of this interview is to collect insights on the current practices of document archiving in accordance with ISO 9001:2015, assess employees' interest in improving the archiving system, and determine their willingness to participate in a potential transformation of the system. The interview targets three key employees: the IT Manager, the Database Manager, and the Quality Manager. This interview is part of a series of discussions that will form a component of my qualitative study, enabling me to analyse and describe the context of electronic archiving within Algerian companies.

Questions

Theme 01: system evaluation

- What is your current method for archiving documents and how it saves the documents?
- Do all employees have access to the archiving platform?
- Are employees permitted to modify archived documents?

Theme 02: Employee Engagement and Perceptions

- How do employees perceive the importance of proper document archiving for the company?
- What challenges do employees face in adhering to the current archiving system?
- what is your opinion on integrating a new electronic archiving system?
- What features or functionalities would you like to see in a new archiving system?

ANNEX02:

TRANSCRIPTION OF AN INTERVIEW

Nom	H. K
Poste	IT manager
Date	28/04/2025
Durée	15 minutes

The interview took place in the IT office on April 28, 2025, guided by a structured interview guide with targeted questions. The responses from the interview are transcribed below.

Theme 01: Archiving system evaluation

Good morning, I am the Information Technology Manager at Maghreb Lampe, where I have been employed for nearly three years. With my experience in managing IT systems and infrastructure, I am pleased to share insights into our current document archiving practices. At present, our archiving system lacks a formal structure or an integrated Enterprise Resource Planning (ERP) solution. Instead, we rely on a shared network folder hosted on our internal server, which serves as the primary repository for company documents. This folder contains a limited range of documents, predominantly order-related files such as purchase orders, work orders, and delivery notes. Access to this shared folder is unrestricted, meaning all employees, regardless of their role or department, can view, download, and modify any document within it. This open-access approach, while simple, does not incorporate version control, audit trails, or security measures to protect sensitive information, leading to potential risks in document integrity and traceability.

Theme 02: Employee Engagement and Perceptions

At Maghreb Lampe, discussions regarding our current archiving system highlight a significant lack of awareness among employees, who demonstrate limited interest and understanding of proper archiving practices. Many are uncertain about which documents require preservation, the rationale behind archiving, and the specific procedures they should follow. This knowledge gap contributes to inconsistent archiving practices and undermines the system’s effectiveness.

As the IT Manager, I frequently receive complaints about the challenges employees face with the existing system. A primary concern is the absence of blank, ready-to-use forms within the

shared network folder, which serves as our primary document repository. The folder predominantly contains completed documents, such as purchase orders and delivery notes. To create new documents, employees must download an existing file, manually delete the previous data, and input new information—a time-consuming and error-prone process that compromises efficiency and accuracy. Furthermore, the shared folder lacks critical documents, particularly those related to management processes, such as quality management records, procedural guidelines, or compliance documentation. This incomplete repository makes it difficult for employees to locate essential documents, leading to frustration and delays in their workflows.

The prospect of implementing a new electronic archiving system presents a valuable opportunity, one I have eagerly anticipated. An ideal future system should prioritize user-friendliness, enabling all employees, regardless of technical expertise, to navigate and utilize its features effortlessly without relying on IT support. Key desired functionalities include the ability for individuals to independently index and categorize their documents, ensuring efficient retrieval. The system must incorporate robust security measures, such as role-based access controls and encryption, to safeguard sensitive data and maintain confidentiality. Most importantly, it should serve as a comprehensive repository capable of storing all company documents including quality management records, operational forms, and administrative files while organizing access in a structured manner to meet the needs of various departments and roles. Additionally, features like version control, audit trails, and automated backups would enhance traceability and data integrity, aligning with both operational and compliance requirements.