Cloud-based Documental Management System: A Bibliometric Review Analysis

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***Abstract*— This document presents a bibliometric review of cloud-based Document Management Systems (DMS) in the supply chain sector, analysing academic literature from 2010 to 2024. It focuses on the role of cloud technologies in improving supply chain efficiency, reducing costs, promoting sustainability, and integrating with other technologies. The study, based on a systematic review of research from the Elsevier Scopus database, highlights key benefits of cloud-based DMS, such as enhanced document accessibility, reduced carbon footprint, and improved data security and compliance. It also explores the reduction of physical paperwork and administrative processes, offering environmental and operational advantages. The review identifies trends, leading authors, and research gaps, providing insights into the future of cloud-based DMS in a more dematerialized supply chain ecosystem.**

Keywords— Cloud; Supply Chain, Logistics; Management; Sustainability; Security; Data Privacy; Data Security; Cloud; DMS; Document Management System; ISO; Environment; New Technology; Digitalization; Cloud-Based Solutions

I. Introduction

According to [1], the existing logistics solutions suffer from several problems that can directly impact all the supply chain effectiveness. It also says that one of the major areas of concern is how to treat documentation that passes through various and different stakeholders. This process where the administration and processing of documents, including those lost or delayed, can end up equalling as much as 20% of the total transportation cost. Despite efforts to promote secure and reliable information sharing through new technologies, documentation remains a significant challenge in the supply chain. The reliance on paper-based processes hampers the efficient exchange of legal information between stakeholders, leading to wasted resources, duplicated efforts, and increased carbon footprint. This inefficiency not only affects operational sustainability but also undermines the overall goal of streamlining and optimizing supply chain practices.

With the growing development of the information flow importance in an organization and the need to have that information always available, stored, secured, and tracked, the companies saw in Document Management System a good opportunity to have all important files in these solutions. The industrial companies looked to this as a strategic implementation, more concretely inside the Supply Chain area that looked to these solutions to improve warehouse and processes productivity, reduce all the costs, and optimize transportation costs and automatize processes. The DMS also developed a solution to share all the documents needed between organizations, giving a huge opportunity to standardize all documentation required in every organization process and promote the use of digital information and not physical documents. With these solutions, it was also possible to understand that it can reduce the Supply Chain carbon footprint, promoting with that a paperless thinking between all stakeholders, estimating that DMS can help reduce the carbon footprint by more than 1400 kgCO2/day [2].

By examining citation patterns and linked networks, this study aims to identify highly cited articles and eminent writers who have significantly influenced the field of cloud computing and resource-based views. With this study, it would be possible to understand how a cloud service solution can impact all supply chain end-to-end processes and how it can be used to reduce administrative costs and the carbon footprint related to those processes.

II. Research Methodology

A. Research Strategy

For this review, a Systematic Literature Review (SLR) research strategy was employed to maximize the benefit of the articles related to the topic under study. Initially, the essential elements for the research were identified: the research questions that would be the focus, the database to search for keywords, the strings which are the terms to be searched in the database, and the criteria established to filter the results. For bibliography management, the Mendeley tool was used, proving invaluable for managing bibliographic references and citations. Mendeley is a free reference manager that readers use to discover the latest research on a given topic and authors use to organize research projects [3].

B. Research Questions

The current research is focused on exploring how a cloud-based Document Management System (DMS) can be incorporated into Supply Chain Management (SCM), with focus on sustainability developments from these implementations. The study is guided by the following research question:

RQ: What does the existing literature from 2010 to 2024 say about the use of cloud-based solutions, more concretely in Supply Chain Management?

III. Literature Review

This chapter describes how the literature review for the topic under study was carried out, identifying initially the research strategy, the databases used, their keywords used and the quality criteria. In the end, it will be shown the results of this research as well as the threats to the validation of the review performed.

A. Identification of the Research

The objective of this study is to explore and analyse the contemporary literature on cloud solutions and their role in enhancing resource-based strategies through the application of a bibliometric analysis methodology. Utilizing quantitative and qualitative techniques, this methodology allowed us a systematic examination of databases to identify prominent

authors that discuss this topic, uncover emerging trends, assess citation patterns, and map the accumulation of scientific knowledge within the field [4].

This research aimed identifying highly cited publications and important authors who have significantly shaped the discourse on cloud solutions and resource-based strategies by analysing citation patterns and related networks. By uncovering these connections between research topics and highlighting emerging areas of interest, this analysis seeks to provide a comprehensive overview of the current state of knowledge by identifying gaps in the literature and suggest potential avenues for future exploration in this rapidly developing domain. Moreover, this bibliometric analysis will contribute to the existing body of knowledge, serving as a valuable resource for researchers, professionals, and students seeking to deepen their understanding of cloud and Document Management solutions and their strategic applications in organizations, while also guiding future advancements in both theory and practice.

B. Articles Selection

The Elsevier Scopus online database was used to find the papers for this study, which followed the quality standards for analysis that were previously set and are listed in the Data criteria section. To start, it was used a procedure to compile pertinent articles. Prior, a more detailed review and selection process, based on predefined criteria, was used to identify articles that were pertinent and contributory to the research. The EBSCO Discovery Service from ISCTE-IUL was also used to conduct and maintain the integrity of the articles used from Scopus database. This methodical approach was designed and constructed to ensure that only the most significant articles were included.

C. Keywords

The keywords used for this literature review were combined with the logical operators "OR" and "AND". These operators help identify specific topics within broad fields of knowledge and find all relevant information about the subjects studied.

D. Data Criteria

In this research, it was used inclusion and exclusion data criteria which allowed us to find the most pertinent publications for the subjects of the study.

E. Overall Findings from the Research

Following the selection of data criteria, the set of keyword search was conducted in the Elsevier Scopus database, focusing on "Cloud". To refine the research scope and enhance clarity, different filters were applied, as illustrated in the table below, including the inclusion and exclusion criteria. Each filter progressively restricted the search, facilitating a more comprehensive understanding of the problem under study. Following a search in the relevant database, the respective filters were applied. This was the final query used in Elsevier Scopus:

(ALL ((document AND management AND system) OR dms) AND TITLE-ABS-KEY (cloud) AND ALL ((logistic) OR (supply AND chain)) AND ALL (sustainability)) AND PUBYEAR > 2009 AND PUBYEAR < 2025 AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SUBJAREA , "COMP") OR LIMIT-TO (SUBJAREA , "ENGI") OR LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "ENVI") OR LIMIT-TO (SUBJAREA , "ECON"))

The outcome of this search is displayed in Table 1, showing the number of articles in each filter stage:

Table 1 - Number of articles in each filter stage

Filter Number	Number of articles
Filter 1	5116
Filter 2	558
Filter 3	553
Filter 4	552
Filter 5	494

F. Key Concepts, Structures and Findings

As previously referenced, during this research, it was used the Elsevier Scopus search engine, retrieving, and extracting information from a total of 494 documents. The keywords of this research were grouped into distinct clusters, enabling an exploration of the interconnected themes within the dataset. It was possible to identify 4 main clusters of keywords, as shown in Table 2, each highlighting distinct yet interconnected areas of research and application. This analysis highlights how different areas are interconnected, demonstrating how innovations in one can have a substantial impact and stimulate innovation in other domains. This method reflects the multifaceted and integrated approach required for contemporary research and application.

Table 2 - Cluster Division

New Technology	**Supply Chain**
Blockchain; Security; Smart City; Internet of Things; Digital Transformation; Technology; Innovation; Industry 4.0; Artificial Intelligence; Machine Learning; Deep Learning; Big Data; Embedded Systems; Learning Systems	Logistics; Decision Making; Manufacture; Competition; Industrial Research; Information Management; Network Security: Life Cycle; Information Systems; Data Analytics
Sustainability	**Cloud Computing**
Green Computing; Technology Adoption; Sustainable Development; Digitalization; Agriculture	Fog Computing; Edge Computing; Digital Storage; Cyber Physical System; Cloud Manufacturing

After a rigorous analysis of each cluster and concentration of the documents divided by their area of study, it was possible to make a qualitative approach of each document, focusing on the content relevant for this project.

IV. Discussion & findings

The main objective delves into the key findings from the analysis made after the literature review and focuses on the three fundamental research questions. By addressing these questions, the chapter aims to provide a comprehensive discussion on the current state of research in this field, the tangible benefits of cloud-based DMS solutions for supply chain operations, and the implications of regulatory standards on their successful deployment. The findings presented not only contribute to the academic sector but also offer practical insights for organizations seeking to leverage and implement cloud technologies and document management systems.

Concretely tackling the specific topic stated in the RQ, here are the specific findings and related discussion.

1) Cloud-Based solutions implementations in different areas

Cloud computing plays a crucial role in different sectors and organizations. Accordingly, to Waqar et al. [5], it facilitates real-time data management, improves collaboration among stakeholders and enhances decision-making processes through the processing of large datasets and guarantees more securable and trustworthy information. Cloud computing has become one of the most used technology due to its advantages and flexibility to implement in every organization in the most structural and important business areas [6] .

Manufacturing and Construction sectors

In the manufacturing and constructions sectors, the use of Cloud solutions is associated with the growing development of the industry 4.0 in the last few years. The capabilities and application of the industry 4.0 had a significant and growing role in the successful implementation of waste reduction techniques [7]. With the cloud solution in this sector, it was possible to reduce product inventory, compared to traditional software downloads on personalized computers, increasing the cost-effectiveness of stock handling by eliminating the need for servers and human-related services. Also, in the emergence of Industry 5.0 these implementations in the manufacturing industry, driven by the integration of technologies like artificial intelligence, and the Internet of Thing revolutionized traditional manufacturing by enabling instantaneous data sharing, optimizing resource management, and enhancing collaboration throughout the supply chain of a manufacturing process. Cloud Manufacturing plays a crucial role in this transformation, offering a flexible, scalable, and efficient production model. This move towards more digital and interconnected systems is not only improving operational efficiency but also advancing sustainability efforts by reducing waste and enhancing energy efficiency [8]. The manufacturing area took advantage of the scalability and mobility of this implementation, which allowed cost reduction compared to traditional software technologies. The mobility methods to check the inventory became a huge tool for stock managers to more accurately compare the need of inventory, saving time on updating computer software and systems that were previously used to estimate these needs. Global accessibility from cloud computing also allowed manufacturers to centralize every management activity into one software, providing a unique database of processes integrated with every stakeholder.

Despite these advantages on using cloud platforms in the manufacturing and construction areas, since these industries are still very dependable in human and inadequate data-structures, implementing a Cloud Manufacturing system could not be possible without structural change in an organization [9]. However, this change also has challenges, particularly for small-to-medium enterprises (SMEs), which may face difficulties with the financial and infrastructural requirements needed to adopt these technologies. To fully capitalize on the advantages of Industry 5.0, industries must prioritize investments in digital infrastructure, workforce development, and innovation, creating a more resilient and sustainable global manufacturing sector [8]. The integration of several different systems from every stakeholder could also be a challenge in the first place due to this lack of data structure. These sectors could not be ready to a drastic change since the facilities of SME's do not seem ready for real-time monitoring via a platform such as CMfg implementation [9]. The geography of the organization could also be a variable to consider when implementing a new technology solution, since the region or country could have a lack of infrastructure and services available in the zone. Waqar et al. [5] gave a complete overview of the challenges that can be considered when implementing a Cloud based solution in the manufacturing and construction areas based in zone and small and medium enterprises implementations:

Technological and Operational

- **Infrastructure Limitations** - Small projects frequently lack sophisticated IT infrastructure.
- **Compatibility Issues -** Making sure cloud solutions work with the different technologies used in construction can be difficult and lead to more expenses and delays.

Risk and Privacy

- **Data Security Concerns -** Protecting sensitive data is critical, requiring robust security measures to prevent breaches and unauthorized access
- **Compliance with Regulations -** Complying with various, regionally specific data protection laws.

Cultural and Behavioural

- **Resistance to Change -** A new technologies due to familiarity with traditional methods.
- **Skills Gap -** A lack of skilled employees in cloud technologies requires significant investment in training and upskilling.

Uncertainty and Resource

- **Financial Constraints -** Tight budgets make it difficult for small projects to afford the initial investment in cloud computing infrastructure and services.
- **Unpredictable Demand -** Fluctuating demand in the construction industry resource planning, can potentially lead to underutilization or overspending on cloud services.

Privacy and Legal

- **Intellectual Property Risks -** Concerns about protecting intellectual property when using shared cloud platforms.
- **Liability Issues -** Determining liability in cases of data breaches or service failures, especially when multiple parties are involved.

Health sector

With the advance of new technologies, the healthcare and medicinal areas were one of the sectors that flourished and provided more developments to enhance the use and implementation of innovation. Artificial Intelligence based algorithms have been widely used in healthcare research, utilizing associated technologies, like cloud computing and IoT, thing that transformed the industry about operational procedures and patient care [10]. In recent years, publications about cloud computing in healthcare services have emerged, more when we discuss the implementation of this technology integrated with IoT, which led to a cumulative growth in about 50% comparing to articles before 2017 [10]. The implementation of cloud technology was used in the sector to store and process medical data, thereby ensuring reduced costs in processing data, improved security and flexibility on sharing information about the patients across different organizations and systems. It is also used for monitoring and

controlling data from wearable devices and other devices that could have integration of IoT technology, allowing providers to detect and treat more effectively specific diseases, giving more detailed real-time information for better decision-making, improving the patient outcome [11]. One of the technologies that are also incorporated with IoT and used to help managing stores and inventory in the pharmacy sector is the implementation of Radio Frequency Identification (RFID) in products. This implementation permits to identify every merchandise using radio waves by tagging them, which contains every relevant information about the specific product, sending the information via Internet of the host system, receiving all the information from the IoT application program used in the companies. This data, such as temperature, vibration, pressure, humidity, light, pollution, give important traceability to the supplier and the pharmacies of all the conditions that the medicines went through before leaving to the client, which permits them to have the knowledge that, if a particular defect occur in a specific node of the chain, allow the chance to address it before it aggravates. The RFID system guarantee the reliability in software test phase, which enriches to a more efficient and cost-effective testing strategies when also implemented in Document Management System [12]. In this context, the cloud computing is an important element of implementation by providing services, applications and data storage spaces, allowing the employees to access every information of the product location and maintenance, anytime and anywhere, which becomes a huge tool when managing stores, facilitating every task of stock management and quality control [13].

The implementations of blockchain integrated with cloud computing are also discussed in the articles about this area. Khanna et al. [14] have worked with the implementation of automated document verification on cloud computing, using blockchain SBTs (Soulbound tokens), which guaranteed verification and authenticity of the documents from the decentralized database. The use of cloud computing reduced the administrative time used to guarantee the verification of the documents, simplifying with both technologies the processes and easy access to the database. This implementation also reduces the risk of fraud and improves efficiency, revolutionizing the sector by ensuring that the documents are secured and cannot be altered during time from the blockchain technology. The use of cloud suggests a change for a decentralized and distributed trust architecture, to improve the traceability and integrity of transactions, conducting the verification of the documents with powerful deep learning algorithms, which also were stored in the cloud system [14]. In resume, the implementation of Cloud Based systems in the healthcare sector are becoming a crucial technology, guaranteeing storage, security, real-time monitoring through all the process. The synergy of using other new technologies like IoT and Blockchain with cloud is also common, improving even more the optimization of processes inherent to the sector.

Financial sector

The financial sector has also had a significant adjustment with the increasing growing of the digital economy. The way that this sector area work has changed dramatically in the last decades, not only for the companies that are in the area but also for its customers, with the implementation of new process payments, new ways of transactions and the use of e-banking for managing and monitoring every aspect of a financial account [15]. This digital transformation has developed the concepts of Financial Technology (FinTech) and Insurance Technology (InsurTech) companies as the basis of several banking services that work under a centralized finance (CeFI) [16]. Digitalization has become the main tool for the financial sector to improve the efficiency, accessibility, and quality of financial services and processes. Lytvyn et al. [15] have summarized the main implementations of digital technologies in the area, correlating with each financial activity or service solutions.

In this context, the use of blockchain has become the emerging technology implemented but, with that, the integration of blockchain with cloud computing, underscores the growing importance of secure, scalable, and decentralized digital infrastructures. The cloud technology has supported the use of blockchain to manage large-scale data while maintaining its decentralized nature [16]. The blockchain and cloud integrated platforms have improved interconnectivity, security, and simplicity of transactions, providing lower data protection costs, technology implementation advantages, and a higher number of transactions supported [17]. The implementation of a Document Management System in this sector is also crucial since there are security and legal procedures that have include informational flow between the financial chains. The use of traditional informational flows such as the use of physical paper documents can cause an enormous impact in financial trade process, since they can be easily misplaced, destroyed, or fraudulently copied [18]. Associated to these problems, it is also possible to add the lack of visibility and shareability of each financial trading process since when a document needs to be redirected to another person/employee, the physical document needs to be physically provided, which can lead to breach in the security measures and increased lead time in every process. The implementation of a cloud-based solution for document storage is the best practice in terms of centralized database for financial transfer partners to enhance transparency, reduce turnaround times, and improve security while minimizing risks and costs. In this sense, the main advantages of a cloud implementation in this sector provides enormous structural benefits throughout all chain, which can be resumed in seven primary areas [15]: Reduced IT costs; Scalability; Availability and Reliability; Data storage and analysis; Data Security; Deployment Speed; Ubiquitous and interoperability. By examining the interplay between blockchain, cloud computing, and other advanced technologies, these innovations represent the future for digital financial enterprises.

2) Application of Cloud-Based solutions in Supply Chain

Digital transformation is becoming crucial for enhancing information sharing and processing in supply chains, which involves extensive data and document exchanges. The potential benefits of digital information sharing (DIS) have led to increased research on cloud-based platforms [19]. This increasing importance of information in supply chain is correlated with the complex series of processes involving numerous activities, from acquisition of raw materials, manufacture, distribution, and product delivery to end users, that are becoming more overflowed with information, due to technological developments and the necessity of

globalization that transformed this sector into a very strategic aspect in all industrial operations [20]. With this demand, the implementation of cloud-based platform in supply chains has emphasized their role in managing and optimizing data flows and have also increased due to the benefits of this kind of solutions [21]. Furthermore, the idea of cloud-based material handling systems (CMHS) has become a major development in the field of Supply Chain, improving the robustness and efficiency of material handling procedures. Cyber-physical systems (CPS) and cloud computing are integrated by CMHS to provide real-time data processing and dynamic resource allocation, both of which are critical to the continuity and responsiveness of logistical networks. In addition to boosting operational effectiveness, this strategy helps supply chains remain sustainable and flexible, especially in the face of growing complexity and worldwide disruptions [22]. The way in which these newly developed cloud-based tools complement established supply chain procedures highlights how digital technology revolutionized contemporary logistics. Palander et al. [23] have defined these six different qualitative benefits when implementing a cloud solution in supply chain: Integration and Standardization; Data-Driven Decision Making; Enhanced Connectivity and Collaboration; Support for Big Data Analytics; Modelling and Optimization; Scalability and Flexibility.

Cloud solutions are normally linked with the implementation of other new technologies such as Blockchain, Artificial Intelligence, Machine Learning and IoT. In the study of Wong et al. [24] it is possible to investigate what specific benefits that a Cloud-Based Machine Learning solution has in a Supply Chain in different quadrants, such as economic, security, sustainability, and technical areas. In this study, it was also implemented a P2P network with blockchain technology for traceability and transparent records in every operation. After the implementation, it was possible to identify that the adoption of a CBML solution had a significant impact across all Supply Chain, which can be grouped into five main outputs: Cost reduction; Energy efficiency; Operational efficiency; Economic benefits; Environmental impact. The DSADV and RCADV implementations are examples of how the sector is aware of the necessity of electronic and faster data communication between every stakeholder. The implementation of Dispatch Advice and Receiving Advice Message in the supply chain guarantees the communication of EDI messages, especially in retail operations. This includes information such as the merchandise sent to the retailer and when confirmation of the reception of the order back to the supplier, all this electronically. As expected, this kind of implementations also resulted in a more transparent, securable and traceable information from every stakeholder, improving its trust in each operation since the blockchain technology provides us clear, immutable records that can be shareable with regulatory entities [25].

V. Conclusion

The existing literature from 2010 to 2024 underscores the increasing importance of cloud-based solutions in supply chain management (SCM), driven by digital transformation and sustainability initiatives. Cloud computing, paired with emerging technologies like AI, IoT, and blockchain, has transformed business operations by enhancing data management, collaboration, and decision-making. Cloud-based Document Management Systems (DMS) in SCM are highlighted for improving operational efficiency, security, and transparency. These systems reduce reliance on paper, cutting costs and minimizing environmental impacts, while also supporting compliance with regulations like GDPR. The integration of cloud with AI and IoT enables predictive maintenance and process optimization, further benefiting SCM. However, challenges remain in areas with limited infrastructure, and smaller organizations may face financial and operational hurdles. Despite these, cloud-based solutions offer clear advantages in enhancing SCM's efficiency, sustainability, and competitiveness. This study focuses on exploring these benefits while considering the sector-specific challenges of implementing cloud solutions across different industries.

Future Work

Future research could explore multiple avenues based on this study's findings on cloud-based Document Management Systems (DMS) in supply chains. While the study analysed impacts on efficiency, security, and sustainability, further investigation is needed across more sectors and in practical environments. A suggested approach is to conduct longitudinal studies to track long-term impacts, focusing on system evolution and user adaptation. The human factor remains crucial, as user interaction and challenges could inform improvements in usability, training programs, and employee satisfaction. Additionally, further research should examine the integration of cloud computing with other technologies and assess whether these continue to enhance document security and compliance in complex, multi-stakeholder environments. Such studies will provide deeper insights into the broader transformative potential of cloud-based DMS solutions across industries.

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