DIGITALIZATION DOCUMENT CONTROL AND DATA RECORDS MANAGEMENT TO SUPPORT BUSINESS INTELLIGENCE OF INTEGRATED DOCUMENTED INFORMATION CONTROL ACTIVITIES AT PT X

Kartika Dyah Sertiya Putri[1*], Praptini Yulianti[2]

[1,2]Master of Management, Faculty of Economics and Business, Universitas Airlangga

E-mail: [1)] kartikadyah1992@gmail.com

Abstract

Digitalization plays an important role in improving document control and data records management to support documented information control activities that integrate business intelligence. This research aims to analyze the impact of digitization in document control and data records management at PT X, as well as how digital technology can improve the efficiency and effectiveness of documented information management. This research uses a descriptive method with a qualitative approach, in the form of a case study at PT X. Primary data was obtained through in-depth interviews with PT X system management staff and direct observation, while secondary data was collected from company documents, annual reports, applied ISO standards, and related literature. The data analysis technique used was thematic analysis. The results showed that a digital document management system can organize documents more efficiently, enable easier and faster access, and improve compliance with ISO standards. Digitalization in document control and records management at PT X resulted in improved operational efficiency, regulatory compliance, and competitive advantage. This research emphasizes the importance of managerial support and organizational culture change in the implementation of digital technology. Thus, the integration of digital solutions not only facilitates better information management but also supports the continuous improvement and business success of PT X in the modern business landscape.

Keywords: Technology, Information, Documented, Recording, Integration

1. INTRODUCTION

Digitalization plays an important role in improving document control and data records management to support documented information control activities that integrate business intelligence (Astuti & Rohmah, 2023). By leveraging digital technologies, organizations can streamline document processes, improve information flow, and enhance decision-making processes (Bradul et al., 2023). The evolution of electronic document management systems, including the transition to electronic document circulation, highlights the importance of embracing digital tools for efficient information handling (Bradul et al., 2023). In addition, the utilization of machine learning models for document processing, language detection, translation, and information extraction demonstrates the potential of advanced technologies in optimizing document management processes and facilitating business intelligence activities (Ghatage et al., 2021). Overall, the integration of digital solutions in document control and data records management is essential for creating a transparent information

space, ensuring regulatory compliance, and gaining a competitive edge in the modern business landscape (Fähndrich, 2023).

A company is a form of business or trader that produces goods and services and then sells them to the wider community to meet their living needs (Ats-Tsauri et al., 2021). Companies certainly drive the country's economy because they will definitely contribute to the country's foreign exchange through taxes. There are many types of companies such as extractive, agricultural, industrial, banking, retail, and so on. In this research, we will discuss companies operating in the manufacturing industry.

In its definition, the manufacturing industry means processing raw materials as input and then processing them physically and chemically so that they change shape, appearance and function into a final product. Copper smelting and refining is one of the industrial companies in the manufacturing sector that processes copper concentrate through a smelting process at very high temperatures to produce copper anodes which are then refined into copper cathodes (Awadhiya & Mishra, 2020).

Currently, PT X is still the only copper smelter and refining company in Indonesia. In its production, PT X has a management system which integrates the systems. This manufacturing industrial company, in its business processes, is committed to SCQDE, namely Safety, Compliance, Quality, Delivery and Earnings as priorities. To sell or trade copper cathodes, when PT X sells cathodes in the London Metal Exchange grade A category, the LME requires that PT X has certification of ISO 45001, 9001, and 14001. To fulfill LME requirements while integrating the three management systems into one department, namely SHE. The OSH, quality and environmental management system is also the responsibility of each business unit or other department in carrying out their respective jobs. Every job in each department, for example the smelting, refining, HR, Security and so on departments must apply the principles and requirements required by ISO 45001, 9001, and 14001. Therefore, document control must be implemented in an integrated manner. Document and administrative control of this management system is under the control of the Systems Management Section.

Integration of document management systems, such as ISO 9001, plays an important role in meeting the requirements of ISO standards such as ISO 45001 and 14001 (Bustelo-Ruesta, 2015; Mulyana, 2016; Riesgo et al., 2005). Certification to ISO standards not only ensures compliance but also drives continuous improvement, alignment of employee competencies, and customer satisfaction (Mulyana, 2016; Vieira et al., 2022). By aligning with ISO standards, companies can improve their operational efficiency, sustainability, and overall product and service quality, which ultimately enables them to meet the requirements to sell products to entities such as the LME (Riesgo et al., 2005).

Controlling documents and records to meet these three ISO standards is not easy. There is a company's vision, mission and policies that must be synergized and determined by top management, there are also procedures, work instructions, forms, stipulations and form records that must be managed. Document management is the process of creating, recording, distributing, socializing, storing documents and recording them so that workers in all line sections or departments always refer to the latest and most current documents. Therefore, this document must be distributed holistically to all work units (Purnomo et al., 2021).

This is still document control, not recording control. Records are documents or forms that have been filled out according to procedural instructions. These records must be

managed within a certain period of time. This activity causes the recording archive storage space to easily become full and disorganized. Full storage space sometimes results in cleanliness and orderliness problems because it is contrary to the 5S principles (*Seiri*/concise, *Seiton*/neat, *Seiso*/clean, *Seiketsu*/careful and *Shitsuke*/diligent) inherent in this company. Recordings that are more than 5 years old are still stored because they have no other choice. In the past, PT X only kept records in physical printed form.

Storage of physical records is used as proof of inspection when recertification or surveillance audits take place. The auditor will ask for evidence of the implementation of standard operating procedures that have been created to fulfill the ISO clauses. Not only when there is an audit, physical printed evidence is intended as a basis for handling when there are OSH problems such as work accidents, quality problems and environmental pollution. Therefore, PT X actually maintains physical printed documents and records (Zainuddin et al., 2023). The difficulty that occurs when PT It is almost certain that officers will have difficulty searching for it because there are so many documents and recordings. So officers need a long time to find these documents or recordings.

Not to mention that the recorded evidence is only written on paper and has not been properly input digitally so that the recorded data is just physical waste that cannot be processed into information that provides benefits or wisdom for top management. These various problems related to document control which make it difficult encourage the management and staff of the Management System Section to carry out continuous improvements. The Management System Section creates an integrated document control system at PT X.

The novelty of this research lies in the integration of digital technologies to improve document control and record data management in support of documented information control activities at PT X. This research highlights the importance of using digital tools for efficient information handling, including the application of machine learning models for document processing, language detection, translation, and information extraction. By integrating these digital solutions, this research shows how companies can create a transparent information space, ensure regulatory compliance, and gain a competitive advantage in the modern business landscape.

2. LITERATURE REVIEW

As technology and information develop, there are many ways that can be used to help with daily work, including work in controlling documents and records. With an integrated server between computers and laptops, all documents and recordings stored on the server can be accessed via any computer that has an account registered with the Information and Technology Section (Turban et al., 2018).

Technological developments certainly really help all types of work. One of which is managing archiving documents and recordings. Apart from existing servers, other facilities such as internet, computers, light copy machines complete with digital scanner facilities have given rise to ideas to simplify the work of controlling integrated documentation.

Uncontrolled documents are documents that are printed at the request of a unit either inside or outside the company, but do not need to be monitored if there is a document update. Obsolete or obsolete documents are documents that are no longer valid and are not used as

work references. These various types of documents must be controlled, maintaining their effectiveness in the long term. Storage of outdated documents, both digital documents and physical printed documents, must also be maintained so that they are not mistakenly used as references. Outdated documents are stored in folders that cannot be accessed by others (Ilham et al., 2021).

Digital document storage will of course require large server storage capacity as well. Digital documents will make it easier for staff to show their documents during audits or investigations. Physical and digital print storage actually has its own advantages and disadvantages. Physical printed documents are permanent and cannot be edited if there are errors and the production process is quite expensive because it uses paper for printing. However, the advantage is that the possibility of cybercriminals is reduced because it can only be accessed physically (Arif, 2014).

3. RESEARCH METHODS

This research uses a descriptive method with a qualitative approach to analyze the effect of digitization in document control and record data management at PT X. This type of research is a case study that focuses on a single manufacturing company, PT X, which is the only copper smelting and refining company in Indonesia. The data sources used in this research include primary and secondary data. Primary data was obtained through in-depth interviews with PT X's system management staff and direct observation of the document control and data management processes. Meanwhile, secondary data was collected from company documents, annual reports, applied ISO standards (ISO 45001, 9001, and 14001), and relevant literature.

The data analysis technique used was thematic analysis, which involved coding the data and identifying key themes that emerged from the data collected. This technique allows researchers to organize and interpret data systematically. For data collection techniques, this study used semi-structured interviews, participatory observation, and company document collection. Semi-structured interviews allow flexibility in exploring topics relevant to the respondents, while participatory observation provides an in-depth understanding of the ongoing process. Company document collection was conducted to obtain accurate and relevant data regarding procedures and policies related to document control and data management.

4. RESULTS AND DISCUSSION

4.1. Research Results

Document management systems organize document management by utilizing various modules and functions to streamline processes efficiently. These systems typically include components such as login and registration modules for user authentication, file repositories linked to controllers to store and organize files in multiple folders accessible to different users with various permissions (Kiplie et al., 2018), and transmission of document preparation data between terminals and servers to offload processing tasks and provide results to designated users. In addition, the system may involve a management device that determines the processing load of different processing devices to optimize document

registration and processing, ensuring that documents are effectively protected and managed across different user interfaces.

The Management Systems section can utilize this technology to simplify documentation control work. The method is to save document archives such as policies, vision, mission, work procedures, forms and work instructions to the server and organize them into a read only mechanism. So that only Management System Section staff can change the special folder where company documents are stored which are used as references. Section unit staff or other departments can still access files in this folder and use them as work references. (Sholiq, 2006)

The Management System Section organizes work procedures in a neat and structured manner starting from the Smelting, Refining, HR, General Affairs, Security, Maintenance and other work unit sections. The Management System section has the authority to ensure that the document files on the server are valid and can be used as a work reference. Management of digital documents and records is written in standard integrated document control work procedures. With this, Management System Section staff no longer need to copy documents into physical prints and distribute them to the work area (Lestanti & Susana, 2016). Even though many documents are no longer copied to physical prints, master documents still have to be physically printed for approval. Updated policies, vision and mission, manuals, procedures, work instructions must be physically printed and approved by the leadership as proof that the specified information is correct and valid since it was approved. After the document is approved, the Management Systems Section staff stamps the master document and scans it through a scanning machine (Lestanti & Susana, 2016).

The scanned master document files are saved to a folder connected to the server. Don't forget to register on the document control form so that all document control activities are always recorded neatly and nothing is missed. Things that need to be recorded, for example, are whether updates to procedural documents have received approval, have been stamped as master documents, whether outdated documents have been removed or not, new documents have been socialized or not, and so on. There is a special form for checking document control activities so that nothing is missed.

RFID (Radio Frequency Identification) technology can significantly benefit the Management Systems section by simplifying documentation control (Marques et al., 2010). By utilizing RFID technology, organizations can develop an architecture that improves traceability, monitoring, and searching of document flows and locations within the organization (Marques et al., 2010). This technology streamlines document identification and traceability, ensuring documents follow the required circuit efficiently (Marques et al., 2010).

In addition, the implementation of an electronic document management system can further optimize document control processes, reduce manual errors, increase productivity, and facilitate easier access to information (Baratov et al., 2023; Frieyadie & Muharam, 2023). In addition, the access control list in the document management system can accurately restrict access based on various security levels, ensuring data security and confidentiality. By integrating RFID technology and electronic document management systems, the Management System section can improve efficiency and effectiveness in controlling the documentation process.

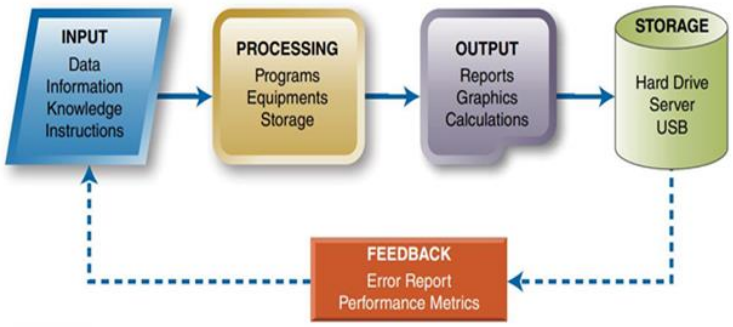
Management Information Systems Theory uses information technology to support and improve the effectiveness of information management in organizations. In the context of this research, Management Information Systems Theory helps explain how the integration of digital technologies, such as computer-based document management systems and machine learning, can improve the efficiency of document and data management at PT X. It covers various aspects, including the design, implementation, and management of information systems designed to support business processes and decision-making. This theory covers various aspects, including the design, implementation, and management of information systems designed to support business processes and decision-making. Using this theory, the research can analyze how the information system implemented at PT X can help ensure compliance with ISO 45001, 9001, and 14001 standards, and improve data transparency and accuracy.

Management Information Systems Theory implies that the successful implementation of digital technology depends not only on technical aspects but also on managerial factors such as staff training, management support, and changes in organizational culture. The theory helps to understand that digitalization is not simply the adoption of new technology, but also involves changes in business processes and organizational structures to maximize the benefits of the technology. Thus, Management Information Systems Theory provides a comprehensive framework to examine how digital technology can be effectively integrated in the management of documents and data at PT X.

Master document data is stored on a special server file which can only be changed by the secretariat or the Management System Section. Section units or other departments can access for reading only. Section units or other departments are not given access to change approved reference documents. If a section unit or department wants to propose changes related to certain procedures or work instructions, they can fill out the requisition document changing form by attaching the documents submitted for change. The secretariat will process it and then update the master document in the file server.

Record data management involves various methods and systems to handle and store data records efficiently. One approach includes data management methods that address synchronization issues between local data storage and database records by utilizing a central management server and a data storage server (Huberman & Miles, 1994). Another system incorporates a records management system that retrieves data from various sources, creates enterprise business records based on the received data, and allows role-based access to these records (Gundavelli et al., 2020). In addition, methods for managing log files, generating snapshots, replicating large binary objects, and deleting objects in the database are essential for maintaining data integrity and storage efficiency (Enkhtaivan et al., 2022).

Furthermore, the data distribution system uses blockchain technology to manage data distribution requests and ensure the secure provision of data based on predefined conditions (Enkhtaivan et al., 2022). Finally, record data management methods implemented on blockchain nodes improve data security and reliability by preventing unauthorized changes to medical information and facilitating synchronization among blockchain nodes (Semantha et al., 2021).



Source : (Turban et al., 2018)

Figure 1. Transformation of Data Input to Data Storage

Staff process the data that has been input into reports. The process of processing data or information is still done simply, namely using filters, graphs and other features from Microsoft Excel. However, the output in the form of a report is very meaningful because it can be used to evaluate trends and predict what will happen in the future (Fajri & Syahyuman, 2012). The results of this report are usually reported to management review to top management or submitted to all section units and departments. This report will certainly be very useful for each unit because it can be used as a lesson or determine the programs in each unit.

The mitigation determined will become a program plan and annual target for next year. This is why information systems, data architecture and data governance are so important. Available information technology can really help work and produce meaningful wisdom. As with document control during audits or investigations, recording management is no less helpful in your work. During recertification and surveillance audits, the auditor will definitely ask about the implementation of the planned documents (procedures and work instructions). Procedures, work instructions and other documents are included in the plans or plans in the PDCA (Plan Do Check Action) cycle.

Recording plays an important role in the PDCA cycle by allowing documentation of each phase of the process improvement journey. The PDCA cycle, also known as the Deming cycle, involves planning, execution, inspection, and action to continuously improve processes (Jelenc et al., 2020; Taufik, 2020). Through recordkeeping, organizations can track the progress made in each phase, identify areas for improvement, and analyze the data to make informed decisions for future actions (La Verde et al., 2019; Moyce et al., 2023). By documenting the results of the "Plan-Do-Check-Act" steps, stakeholders can review the effectiveness of implemented changes, learn from successes and failures, and iteratively refine processes to achieve optimal results, ultimately contributing to the overall efficiency, quality improvement, and success of the organization.

In the context of the PDCA model and auditing practices, recordkeeping is essential to ensure compliance and quality improvement (Gasoma et al., 2022; Kornienko. et al., 2023). Audits serve as a check to verify whether recordkeeping procedures are being followed correctly, allowing the identification of areas that can be improved even if processes are already in place (Gasoma et al., 2022). Continuous audit efforts can lead to continuous improvement in recordkeeping practices, highlighting the importance of regular audits in maintaining high standards of documentation. When bottlenecks are identified during audits,

they can trigger the need for mitigating actions, aligning with the "Action" phase of the PDCA cycle, where corrective measures are implemented to address root causes and improve processes (Gasoma et al., 2022; Kornienko. et al., 2023). Therefore, the ongoing audit process plays an important role in not only identifying areas for improvement but also in driving corrective actions to improve recordkeeping practices.

Based on the Technology-Organization-Environment Theory or TOE Framework proposed by (Tornatzky & Fleischer, 1990). TOE Framework is a comprehensive framework for understanding the factors that influence the adoption and implementation of technology in organizations. This theory identifies three main elements that influence an organization's decision to adopt technology: technological factors, organizational factors, and environmental factors.

Technological factors include characteristics of the technology to be adopted, such as relative advantage, compatibility, complexity, and ease of use. In the context of this research, the technology in question is a computer-based document management system and machine learning model integrated in document and data management at PT X. This research analyzes how this technology can improve efficiency and accuracy in document control.

Organizational factors include internal organizational characteristics that influence technology adoption, such as company size, organizational structure, resources, and organizational culture. PT X, as a large manufacturing company with various ISO standards to comply with, has specific needs in document and data management. This research examines how organizational structure, management support, and human resource readiness at PT X affect the implementation of digital technology.

Environmental factors include external elements that influence technology adoption, such as pressure from competitors, government regulations, and market conditions. This research considers how industry regulations and standards, as well as competitive pressures, drive PT X to adopt digital technology in document and data management.

Based on the TOE Framework, it shows that the success of technology implementation at PT X depends on the balance between these three factors. For example, although the technology used is very sophisticated, without adequate organizational support and strong environmental awareness, the implementation of the technology will not be optimal. Using the TOE Framework, this research not only provides insight into the factors that influence technology adoption at PT X, but also offers guidance for other companies looking to adopt similar technologies to improve efficiency and regulatory compliance in document and data management.

The theoretical implications of the results of this study include contributions to the information management literature and digital technologies in the context of document control and data management. This research shows how the integration of digital technologies, such as computer-based document management systems and machine learning models, can improve efficiency and accuracy in managing information. It enriches existing theories on information systems management by adding new perspectives on the use of advanced technologies to support document control and regulatory compliance. In addition, this research also underscores the importance of a holistic approach that includes both technical and managerial aspects in the implementation of digital systems.

Practically, the results of this study provide guidance for companies, especially in the manufacturing sector, on steps that can be taken to optimize document and data management

through digitization. The implementation of digital technology in document control at PT X can serve as a model for other companies facing similar challenges. The findings can also assist managers and practitioners in identifying and overcoming barriers in digital technology adoption, as well as developing effective strategies for the implementation of computer-based document management systems. Thus, this research not only offers concrete solutions to practical problems faced by PT X, but also provides valuable insights that can be widely applied in different industries.

5. CONCLUSION

Based on the research results in the manuscript, this study shows that the digitization of document control systems and data records management plays an important role in supporting documented information control activities and integrating business intelligence. By leveraging digital technology, organizations can streamline document processes, improve information flow, and enhance decision-making processes. The research also highlights the importance of implementing electronic document management systems that can improve operational efficiency, sustainability, and overall product and service quality. The integration of digital solutions in document control and data records management is essential for creating a transparent information space, ensuring regulatory compliance, and gaining a competitive edge in the modern business landscape. In addition, ISO standard certifications such as ISO 45001, 9001, and 14001 implemented at PT X not only ensure compliance but also drive continuous improvement, alignment of employee competencies, and customer satisfaction.

REFERENCES

Arif, M. R. (2014). Aplikasi Sistem Pengarsipan Dokumen Menggunakan Metode Prototipe. Nusantara of Engineering (NOE), 1(2).

Astuti, D. S. P., & Rohmah, U. (2023). The effect of application of audit digitalization on auditor performance with professional ethics as a moderation variable:(survey on KAP in Central Java). Journal of Management, Accounting, General Finance And International Economic Issues, 2(2), 598–606.

Ats-Tsauri, M. I., Setiawan, R., & Wiyatno, T. N. (2021). Tinjauan Literatur Sistematis Implementasi Total Quality Management pada Industri Manufaktur â€“Tren Terkini dan Arahan Masa Depan. Jurnal Teknik Industri, 2(2), 65–79.

Awadhiya, M. T. S. G., & Mishra, T. (2020). Performance of Total Quality Management in Manufacturing Industry to Increase Production Rate.

Baratov, D., Aripov, N., Jumanov, X., & Muhiddinov, O. (2023). Automated technology of control of technical documentation of automation and telemechanics. AIP Conference Proceedings, 2612(1).

Bradul, A., Burkova, L., & Shepeliuk, V. (2023). Organization and implementation of electronic document management at enterprises: the path to digitization of the information space of the accounting and taxation.

Bustelo-Ruesta, C. (2015). La serie de normas ISO 30300-management system for records:

la gestión de los documentos integrada en la gestión de las organizaciones.
Enkhtaivan, B., Nakagawa, S., Kajigaya, K., & Takenouchi, T. (2022). Data management method, data distribution system, computer program and recording medium. Google Patents.
Fähndrich, J. (2023). A literature review on the impact of digitalisation on management control. Journal of Management Control, 34(1), 9–65.
Fajri, H., & Syahyuman, S. (2012). Sistem Pengelolaan Arsip Dinamis Aktif di Kantor Perpustakaan, Arsip, dan Dokumentasi Kabupaten Pesisir Selatan. Ilmu Informasi Perpustakaan Dan Kearsipan, 1(1), 409–417.
Frieyadie, F., & Muharam, F. (2023). Electronic Receipt of Document Control System using Technology Acceptance Model. JURIKOM (Jurnal Riset Komputer), 10(2), 519–528.
Gasoma, E., Abdalla, I., & Afif, M. (2022). A Comprehensive audit of record keeping practice in surgical inpatients records.
Ghatage, P., Viswanathan, K., Fernandes, S., & Thangaraj, N. K. (2021). Automation and digitizalization of document processing systems. Google Patents.
Gundavelli, S., Gaitonde, V., Lee, M., Hota, S., & Chandu, S. R. (2020). Enterprise Business Record Management System. Google Patents.
Huberman, A. M., & Miles, M. B. (1994). Data management and analysis methods.
Ilham, M., Sari, D. D., & Zulkhairi, Z. (2021). Efficacy of Information System in Managing Archives in Indonesia's Ministry of Religion's Office. Pionir: Jurnal Pendidikan, 10(3).
Jelenc, L., Lerner, S., & Knapic, V. (2020). Strategy deployment using PDCA cycle. Jelenc, L., Lerner, S., & Knapić, 2020, 11–17.
Kiplie, F. H., Yatin, S. F. M., Angutim, M., & Hamid, N. H. A. (2018). System development for document management system. International Journal of Academic Research in Business and Social Sciences, 8(9), 748–757.
Kornienko., A. ., Moskvitin, O. A., & Berezgov, A. S. (2023). Plan-Do-Check-Act Model (PDCA) as a Possible Methodological Basis for Antimonopoly Compliance. Rossijskoe Konkurentnoe Pravo i Èkonomika, 1, 68–79.
La Verde, G., Roca, V., & Pugliese, M. (2019). Quality assurance in planning a radon measurement survey using PDCA cycle approach: what improvements? International Journal of Metrology and Quality Engineering, 10, 2.
Lestanti, S., & Susana, A. D. (2016). Sistem Pengarsipan Dokumen Guru Dan Pegawai Menggunakan Metode Mixture Modelling Berbasis Web. Antivirus: Jurnal Ilmiah Teknik Informatika, 10(2).
Marques, R. P., Santos, C., & Santos, H. (2010). Automation of the Approval and Control Process of Documents. ENTERprise Information Systems: International Conference, CENTERIS 2010, Viana Do Castelo, Portugal, October 20-22, 2010, Proceedings, Part I, 328–337.
Moyce, S., Claudio, D., & Velazquez, M. (2023). Using the PDCA cycle to uncover sources of mental health disparities for Hispanics. International Journal of Mental Health Nursing, 32(2), 556–566.
Mulyana, Y. (2016). Penerapan Sistem Manajemen Mutu (SMM) International Standardization Organisation (ISO) 9001: 2008 Di SMKN 2 Pengasih Kulon Progo. Jurnal Khatulistiwa Informatika, 7(1), 489899.

Purnomo, A., Firdaus, M., Sutiksno, D. U., Putra, R. S., & Hasanah, U. (2021). Mapping of business intelligence research themes: four decade review. 2021 IEEE International Conference on Communication, Networks and Satellite (COMNETSAT), 32–37.

Riesgo, P., Suárez, A., & Iglesias, F. J. (2005). Hacia un Modelo de Sistemas de Gestión de la Seguridad y Salud Laboral según el estándar OHSAS en el Sector de Bienes de Equipo. IX Congreso de Ingeniería de Organización, 27.

Semantha, F. H., Azam, S., Shanmugam, B., Yeo, K. C., & Beeravolu, A. R. (2021). A conceptual framework to ensure privacy in patient record management system. IEEE Access, 9, 165667–165689.

Sholiq. (2006). Pemodelan sistem informasi berorientasi objek dengan UML. Graha Ilmu.

Taufik, D. (2020). PDCA cycle method implementation in industries: a systematic. IJIEM (Indones J Ind Eng Manag), 1, 157–166.

Tornatzky, L. ., & Fleischer, M. (1990). Technological Innovation as a Process. In The Processes of Technological Innovation (pp. 27–50). Lexington Books.

Turban, E., Pollard, C., & Wood, G. (2018). Information technology for management: On-demand strategies for performance, growth and sustainability. John Wiley & Sons.

Vieira, S., Costa, E. S. P., dos Santos, C. A., & Berbara, R. L. L. (2022). Certificação ISO 9001 em uma instituição pública de ensino e pesquisa agrícola: um estudo de caso. Research, Society and Development, 11(3), e0911325973–e0911325973.

Zainuddin, Z. I., Taryana, A., Nuryanto, Y., & Sandjaya, T. (2023). Penyimpanan Arsip Digital di Record Center Ibnu Sina Universitas Padjadjaran. Responsive: Jurnal Pemikiran Dan Penelitian Administrasi, Sosial, Humaniora Dan Kebijakan Publik, 6(4), 185–192.

Copyrights