Process Management Tools for Operation Efficiency in Logistics: Case Study

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Abstract. In the context of increasing complexity in global supply chains, effective process management has become a crucial determinant of operational efficiency in large-scale logistics companies. This study aims to assess the impact of an advanced process management system, introduced in 2022 within one of the largest logistics enterprises, with the objective of optimising internal communication and streamlining operations. Utilising a rigorous analytical framework, the research demonstrates significant improvements in information flow, transparency, and organisational clarity. The system has shown notable efficacy in key areas, including the implementation of quality and environmental policies, the optimisation of core operational processes, and the enhancement of management documentation. The findings suggest that process management contributes substantially to the achievement of higher operational efficiency and process optimisation. Furthermore, this study offers practical recommendations that may guide similar organisations in improving their logistical performance through systematic process management innovations.

Keywords: process management, operational efficiency, process management system (PMS).

Introduction

Relevance of the article

Effective process management is crucial for large-scale logistics companies facing increasing complexity in global supply chains. This study is relevant to organisations, for it addresses the need to optimise communication and operational efficiency, which are often hindered by bottlenecks and reduced transparency. Scientifically, the research fills a gap in the limited empirical data on process management systems in logistics, offering new insights into their impact on improving internal communication. From a practical standpoint, the study shares solutions to common challenges faced by logistics specialists, offering actionable recommendations for enhancing operational efficiency, and aligning processes with evolving industry standards.

Problem investigation level

Research on process management systems in logistics has gained attention, as companies seek to optimise operations in complex global supply chains. Previous studies have largely focused on general supply chain efficiency, with limited attention to internal communication and document flow. Notably, Gardner et al. (2019) emphasised the role of transparency in reducing bottlenecks, while other authors (Ahire, & Dreyfus, 2000) highlighted the impact of technology on streamlining processes.

Scientific problem

How can advanced process management systems in logistics optimise resource allocation more effectively to reduce operational inefficiencies, considering the lack of comprehensive methods and insufficient research on integrating quality policies with operational processes?

Object of the article: process management in an international logistics company.

Aim of the article: to systematically investigate the influence of process management methodologies on enhancing operational efficiency and optimising resource allocation within the context of international logistics.

Objectives of the article:

1. To review the concept of process management system in logistics by conducting a theoretical analysis of scientific literature;
2. To analyse process management system implementation journey of selected logistics company;
3. To explore and define the most problematic areas and potential improvements by analysing qualitative and quantitative case study results.

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***Methods of the article*:** a combination of literature review, interviews, and quantitative data analysis is conducted to assess the impact of a process management system on operational efficiency in an international logistics company.

1. Introduction

Why process management is a key element in operational efficiency?

Process management is a systematic approach (De Ramon Fernandez, Fernandez, & Garcia, 2020) aimed at improving an organisation's efficiency by optimising its operational workflows. In the context of logistics, effective process management is paramount (Grant, Wong, & Trautrims, 2017), as logistics operations are inherently complex and involve multiple stakeholders across global supply chains. The evolution of Process Management Systems (PMS) has transformed traditional logistics practices by shifting from paper-based processes to digitalised solutions (Kern, 2021). Digitalisation in logistics not only improves information flow and minimises bottlenecks (Li, Zhuang, Yang, Lu, & Xu, 2024), but also enhances the overall operational performance of companies.

The transition from paper-based process management to digitalised systems is supported by various theories that emphasise the importance of efficiency, agility, and innovation (Najat, Moussaoui, & Eddine, 2024). By leveraging technology (Adeniran, Efunniyi, & Omozele, 2024), logistics companies can gain valuable insights, streamline processes, and achieve significant improvements in operational efficiency.

An increasing body of literature emphasises the impact of digitalisation on PMS in logistics. Researchers indicate that companies transitioning to digitalised systems experience reduced communication delays and enhanced operational agility (Ononiwu, Onwuzulike, & Shitu, 2024). However, despite the advantages, challenges such as integration issues with existing systems and the shift from a traditional mindset to a digital culture remain prevalent and often reveal several challenges, including inefficient communication flows (Montreuil, Ballot, & Fontane, 2012), fragmented documentation practices, and the lack of system interoperability (Giachetti, 2004).

Business process management system as standalone system

Paper-based process management practices, characterised by physical documentation and manual workflows, have been pervasive (Xiao, Zhang, & Zhong, 2023) in many organisations. While these systems may have served their purpose historically, they present several limitations, including inefficiency in information retrieval, difficulty in maintaining accurate records, and the risk of data loss. As companies analyse the feasibility of transitioning from paper-based systems to digital solutions, a critical question arises: Is the creation of a new system necessary? The decision hinges on several factors, such as challenges of transitioning, integration capability, scalability, and user training (Dikert, Paasivaara, & Lassenius, 2016).

Ultimately, organisations must weigh the benefits of creating a new, tailored system against the costs and complexities of integrating and modifying existing solutions (Davenport, 2000), as usually, they already have document management systems, e-learning systems and HR management systems, which partly have process management systems features. A systematic review of the most popular system goals, their main functions, users, and foci is provided in Table 1.

Table 1

Most popular management systems review

	Learning management system	Document management system	Business process management system
Goal	Manage learning processes	Manage organisational documents and their flows	Optimise and manage business processes
Main functions	Course development, employee training monitoring, progress assessment, certification	Document storage, access control, version control, search and traceability	Process modelling, automation, monitoring, analysis and improvement
Users	Teachers, students, HR specialists	All employees of the organisation	Managers, coordinators, business analysts, IT specialists
Focus	Acquisition and development of knowledge and skills	Document management, organisation and accessibility	Business process efficiency, automation and continuous improvement

Source: Bist (2022); Richard (2020); Guustaaf (2021); Zuhaira (2021); Pranata, (2023); Rahardja (2019); De Ramon Fernandez (2020); Rashi (2022); Cagnin (2021).

As mentioned in Table 1, business process management system differs from other systems that companies have. A process management system (PMS) typically encompasses several key features that enable organisations to efficiently manage and optimise their processes.

Enhancing efficiency through process management tools

Researchers highlight that in today's fast-paced business environment, organisations must continuously seek ways to enhance efficiency, reduce costs, and improve overall performance (Van Cott, Singer, & Druckma, 1997). Process management tools have emerged as a vital tool in achieving these objectives by streamlining operations and optimising workflows. One of the cornerstone functionalities of process management software is the ability to create detailed process models and maps (Meidan, García-García, Escalona, & Ramos, 2017). Users can visually document their workflows, identifying each step, the individual tasks involved, and the flow of information. This visualisation helps organisations communicate process steps clearly, making it easier for stakeholders to understand different roles and responsibilities. Additionally, by mapping processes, businesses can identify bottlenecks (Hunt, 1996), redundancies, and areas for improvement, laying the groundwork for process optimisation. Many software solutions include built-in communication tools (Vukšić, 2018) that facilitate teamwork across departments and locations. Features such as shared workspaces, comment sections, and integrated messaging allow team members (Bassanino, Fernando, & Wu., 2014) to stay connected, share updates, and discuss challenges in real-time. Improved collaboration not only enhances productivity but also fosters a culture of collective problem-solving and innovation. Version control is a critical feature (Pourmirza, Peters, Dijkman, & Grefen, 2017) in process management software that facilitates the management of changes made to process documentation, workflows, and associated assets. This functionality allows organisations to maintain a historical record of all modifications, ensuring that teams can track the evolution of their processes over time (Harmon, 2019). With version control, users can easily view previous iterations, understand what changes were made and by whom, providing valuable context for decision-making. This is especially important for businesses operating in regulated industries, where maintaining accurate documentation is essential for compliance. Moreover, version control helps prevent confusion that can arise from multiple users editing documents simultaneously (Pilato, Collins-Sussman, & Fitzpatrick, 2008), as it allows users to work with the most current version while preserving earlier drafts for reference or rollback, if necessary.

Accessibility is another essential aspect of effective process management software. It ensures that users from various departments and roles can easily access necessary resources (Štemberger, Bosilj-Vukšić, & Jaklić, 2009), whether it is process documentation, workflow outlines, or performance metrics. High-quality process management systems often include user permissions and roles that dictate who can view or edit content, thus balancing access and control. Moreover, accessibility also encompasses mobile compatibility, allowing users to engage with process

information on the go, fostering a responsive and agile work environment (Suša Vugec, Stjepić, & Sušac, 2019). Structural alignment is equally vital, as a well-organised platform enables users to navigate information intuitively. By employing systematic categorisation and tagging features, process management software allows users to quickly locate relevant documents and workflows, enhancing overall usability. A robust search function also contributes to this ease of access, enabling users to find specific processes or data using keywords or filters. Together, accessibility and structural alignment contribute to a more efficient team collaboration, minimising downtime and miscommunication associated with process retrieval. Linking functionalities in process management software provide the ability to connect related documents, processes, and workflows, creating a cohesive network of information (Wetzstein et al., 2007). This interconnectedness allows users to see how various processes impact one another, supporting better decision-making and fostering a holistic understanding of operational dynamics. For instance, by linking related tasks to specific outcomes or performance metrics, teams can easily trace back results to the originating processes, enabling thorough analysis and targeted improvements. Moreover, linking not only enhances visibility but also promotes better collaboration among teams. Because users can reference interconnected processes and documents, it facilitates discussions around shared challenges and collective problem-solving (Munthali, Van Paassen, Leeuwis, Lie, & R., 2021). This feature often extends to integrations with external applications and platforms, allowing seamless data transfer and interaction with tools such as project management software or communication platforms. By leveraging linking capabilities, organisations can enhance their process management, ensuring that teams remain aligned and informed about how their individual contributions fit into broader organisational goals. (Table 2)

Table 2

Process Management System Features

Feature	Meaning
Process Mapping and Documentation	Enables visualisation of workflows, flowcharts and business processes. Facilitates the creation and storage of process documentation, including standard operating procedures (SOPs) and guidelines.
Collaboration and Communication Tools	Enables sharing of documents, updates, and feedback seamlessly among team members.
Version Control	Tracks changes made to processes and maintains version control for documentation, automatically informs about document for update/review.
Accessibility and Structure	Allows to apply different accessibility to documents, select process owners, validate processes, trace of access.
Linking and Interconnectivity	Allows to link documents, zoom in and zoom out.

Source: Meidan, García-García, Escalona, & Ramos (2017); Vukšić (2018); Pourmirza, Peters, Dijkman, & Grefen (2017); Štemberger, Bosilj-Vukšić, & Jaklič (2009); Suša Vugec, Stjepić, & Sušac (2019); Wetzstein et al. (2007).

All process management system features influence companies' management success, and that should be tested in real life.

2. Research methodology and data analysis on optimisation methods of advanced process management implementation in logistics

Research method and data

Aim of the research is to examine the progress of ten logistics companies in the implementation of a process management system, the challenges faced, and successes achieved.

The research was conducted at ten logistics companies in Europe that provided postal service. To achieve the set goal, qualitative interviews were conducted with process/quality managers, administration managers, and business development managers. The selected company, operating in Europe for over 20 years, holds a leading position in its segment, providing postal and logistics services. With a workforce of 57,000 employees and sales revenue of 15.69 billion euros in 2023, it is classified as a large company. The company serves individual clients (B2C) and legal entities (B2B). It is innovative, implementing both managerial practices (LEAN, ISO) and technological innovations in its operations. The company invests in process effectiveness strategies, one of which

was Process Management Software, implemented in all ten companies for two years.

Data and data analysis method. Ten logistics companies that implemented the same process management software were asked to complete the same survey three times: before the implementation of the process management system, during the implementation, and after the implementation of the process management systems software. Selected employees from the project management team were asked to complete the survey to understand the scope and expectations, as well as employees from the direct process management systems administrators, such as process/quality managers, administration managers, and business development managers. The data was kept and archived in Microsoft Forms and analysed applying statistical methods in Microsoft Excel. The data was gathered and categorised and analysed from different angles.

The research data analysis and the discussion of the results

Research was conducted in ten international logistics companies that have implemented the same process management systems software for two years, from 2022 to 2024. The selected software was purchased by head office and must be implemented in all group business units within three years.

The primary objective of the first stage of the research was to gain a thorough understanding of the current "as-is" situation within the organisation and to identify the key challenges that the selected software must address to optimise process management. This initial phase was critical for establishing a baseline against which improvements could be measured and evaluated.

To gather relevant insights and perspectives, a comprehensive survey was conducted among employees across various departments. The results of this survey have been meticulously categorised into four distinct areas, each representing specific challenges that the process management system is expected to resolve. These categories are Process Visibility and Documentation, Access and Permissions, Document Management and Control, and Search and Retrieval (Table 3). Each category encompasses a range of issues that employees have encountered in their daily operations.

Table 3

Categories and subcategories of process management system challenges before software implementation

6. Category	Main issues
Process Visibility and Documentation	• We do not have a common process view or map, making it difficult to understand workflows. • Documents are not effectively linked to each other, leading to information silos. • There is a lengthy and untraceable document approval cycle, resulting in delays and inefficiencies.
Access and Permissions	• There is currently no option to apply different levels of accessibility to various documents, which poses security risks. • There is a lack of clear linkage to the responsible individuals for each document, causing accountability issues. • The absence of traceability regarding who has accessed documents further complicates compliance and oversight.
Document Management and Control	• We do not have sufficient validation and versioning functionality to ensure document accuracy and currency. • There is no mechanism for the automatic assignment of documents for updates or reviews, leading to outdated information. • The current system lacks the capability to transfer documents to external partners seamlessly, constraining collaboration efforts.
Search and Retrieval	• The system does not support keyword search functionality, making it difficult to find relevant documents quickly. • Employees are unable to utilise flowcharts for visual representation of processes, thus hindering the understanding of workflows.

Source: created by the author.

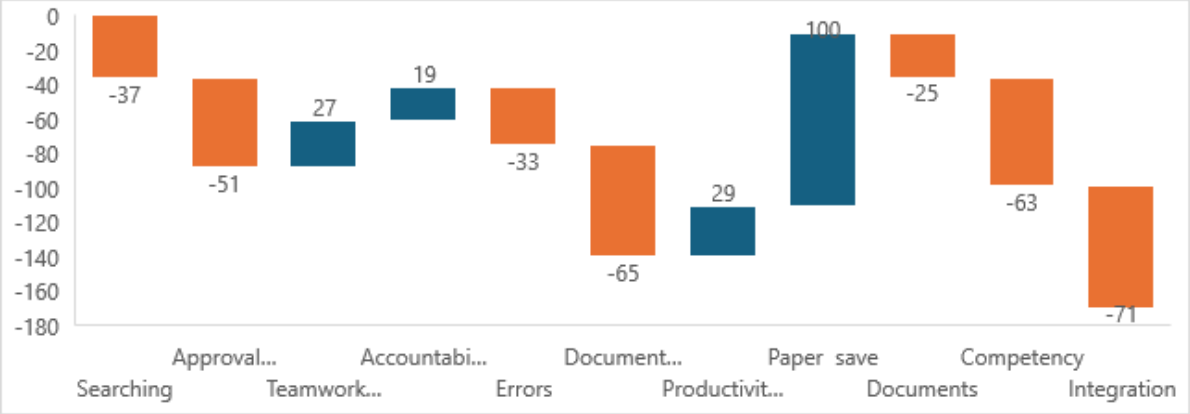
The second stage of the research was conducted to provide a comprehensive assessment of the progress made in the implementation of the process management system. The aim was to determine how effectively the implementation aligns with initial expectations and to uncover any discrepancies between what was anticipated and what has occurred in practice.

The survey results revealed some promising outcomes, notably, the volume of documents has

decreased significantly by 25 per cent. This reduction indicates an efficient streamlining of documentation processes, suggesting that the organisation is becoming more adept at managing its information flow. Additionally, it was found that approximately 37 per cent less time is now spent searching for documents, handling approvals, and managing updates. This time-saving improvement speaks volumes about the impact of the new system on operational efficiency and productivity.

However, despite these positive results, there are concerns among the process management systems administrators. A significant majority, accounting for 63 per cent, reported feeling a lack of competency, indicating that further training and support may be necessary to empower them in their roles. This highlights a gap in the skillset needed to fully leverage the new system's functionality. Moreover, a striking 71 per cent of administrators expressed dissatisfaction with the level of integration between the process management system and the other software solutions currently in use. This lack of seamless integration may hinder the overall effectiveness of the system, and suggests that addressing these integration challenges should be a priority moving forward.

Overall, while the implementation of the process management system has yielded notable benefits, the feedback from administrators underscores the need for continuous improvement in both training and software integration efforts to ensure that the full potential of the system is realised (see Fig. 1).



Source: created by author.

Fig. 3. Improvements when transitioning from paper-based document management to process management software

The third stage of the research was conducted several months after the initial implementation of the process management system, marking a critical juncture in evaluating the effectiveness of the new software. To assess the impact of the system and gather updated insights, a survey was administered once more to the same group of company employees. This survey was structured around the same key categories as before: Process Visibility and Documentation, Access and Permissions, Document Management and Control, and Search and Retrieval. By maintaining these categories, the research aimed to facilitate a comparative analysis of employee experiences and perceptions before and after the software implementation.

However, the findings from this stage revealed that the organisation faced challenges that were notably more significant than those typically encountered during a standard software implementation process. One of the most pressing issues highlighted was the lack of commitment from managers in adopting and utilising the new software. Approximately 65 per cent of respondents reported that this lack of managerial support hindered the effective use of the process management system, ultimately impacting overall organisational buy-in.

In addition to managerial disengagement, resistance to change emerged as a widespread concern among employees. An impressive 87 per cent of respondents indicated that they encountered resistance to transitioning to the new software, suggesting a strong attachment to existing practices

and scepticism about the benefits of the change. This resistance can often stem from employees' fears about adjusting to new workflows or concerns about the technology's reliability and efficacy.

Moreover, 93 per cent of respondents mentioned integration issues, pointing to significant challenges in aligning the process management system with the existing software and tools used within the organisation. These integration difficulties not only created operational inefficiencies but also contributed to frustration among employees who relied on seamless connectivity between systems for their day-to-day tasks.

Despite these challenges, it is important to highlight the positive feedback received regarding the software's impact on management dynamics. An encouraging 89 per cent of respondents noted that middle managers felt empowered because of the new system, suggesting that the software fostered greater autonomy and decision-making capabilities at the middle management level. This empowerment is crucial, as it can lead to improved team performance and heightened accountability.

Additionally, 81 per cent of respondents recognised the inclusion of end users in the process as a significant success factor. This inclusion likely enhanced employee engagement and provided valuable insights that contributed to a more user-centric approach to the system's deployment. By incorporating feedback from those who interact with the software directly, the organisation demonstrates a commitment to continuous improvement and adaptation in response to user needs.

In summary, while the third stage of the research revealed a range of challenges associated with the implementation of the process management system, it also underscored notable successes, particularly in terms of empowering middle managers and involving end users. These insights can serve as a foundation for the organisation to refine its strategies, foster a culture of support for change, and ultimately enhance the effectiveness of the software in achieving its intended goals. Addressing the barriers to successful implementation is crucial for realising the full potential of the process management system and driving organisational growth in the future.

Conclusions

1. The theoretical analysis of scientific literature concerning process management systems in logistics underscores their pivotal role in augmenting operational efficiency, optimising workflow, and enhancing overall supply chain performance. The review indicates that effectively implemented process management systems empower organisations to achieve superior decision-making capabilities and bolster adaptability in response to fluctuating market dynamics.
2. The implementation of the process management system within the cohort of ten logistics companies resulted in statistically significant enhancements in documentation efficiency and time management, evidenced by a 25 per cent reduction in the volume of documents and a 37 per cent decrease in time allocated to document-related tasks. Notably, challenges such as inadequate managerial support, employee resistance to change, and difficulties with system integration persist, underscoring the necessity for continuous training initiatives and strategic alignment with pre-existing technological frameworks. In conclusion, while the transition has demonstrated potential in empowering middle management and fostering end-user engagement, addressing these identified barriers is essential for optimising the system's efficacy and promoting sustainable organisational growth.
3. Achieving effective process management in logistics necessitates a comprehensive and strategic approach that encompasses several critical components, including continuous training, a cultural shift towards process-oriented thinking, and the integration of advanced technologies.

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