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Article

A SYSTEMATIC REVIEW OF ERP-INTEGRATED DECISION SUPPORT SYSTEMS FOR FINANCIAL AND OPERATIONAL OPTIMIZATION IN GLOBAL RETAILS BUSINESS

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ABSTRACT

Enterprise Resource Planning (ERP) systems and Decision Support Systems (DSS) have become critical components in driving digital transformation, operational efficiency, and strategic decision-making in the global retail industry. The integration of these systems enables organizations to unify transactional workflows with advanced analytics, allowing for real-time visibility, financial control, inventory optimization, and data-driven decision automation. This systematic review examines the convergence of ERP and DSS technologies with a particular focus on their role in enhancing financial and operational performance in multinational retail enterprises. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines, a total of 230 peer-reviewed articles published between 2012 and 2024 were identified, screened, and analyzed. The review synthesizes findings across multiple themes, including business intelligence, predictive analytics, inventory management, financial forecasting, and executive decision automation. The results indicate that ERP-DSS integration significantly improves forecasting accuracy, cross-border financial consolidation, operational agility, and strategic responsiveness in retail environments. Additionally, organizations with higher ERP-DSS maturity demonstrated greater resilience, performance consistency, and innovation capacity, especially when supported by robust data governance and localized implementation strategies. However, the review also identifies critical challenges, such as cultural resistance, integration complexity, and regulatory diversity, particularly in multinational contexts. Overall, the study underscores ERP-DSS integration as a foundational enabler of enterprise intelligence and strategic value creation in the modern retail sector, offering insights for researchers, practitioners, and policymakers seeking to advance performance and adaptability in data-intensive business environments.

KEYWORDS

ERP Systems; Decision Support Systems (DSS); Retail Operations Optimization; Financial Performance; Integrated Business Intelligence;

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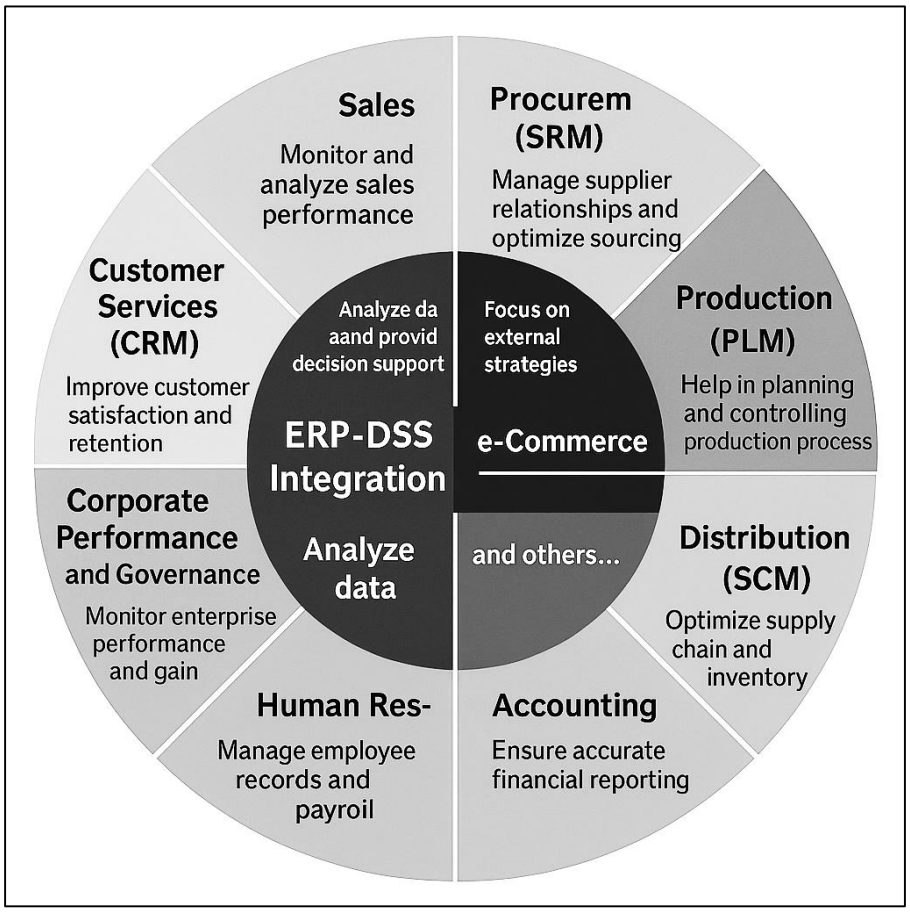
INTRODUCTION

Enterprise Resource Planning (ERP) systems are comprehensive, integrated platforms used by organizations to manage and automate core business processes, including finance, human resources, inventory, and supply chain operations (Hietala & Päivärinta, 2021). Originating in the manufacturing sector, ERP solutions have evolved into strategic tools adopted across diverse industries, including retail, due to their capacity to centralize data, enhance coordination, and streamline workflows (Jayender & Kundu, 2022). In parallel, Decision Support Systems (DSS) are computer-based tools that assist in making informed decisions by analyzing large volumes of structured and unstructured data using quantitative models and expert knowledge (Samaranayake, 2009). When ERP is integrated with DSS, organizations gain enhanced analytical capabilities for real-time decision-making and scenario planning (Ghobakhloo et al., 2019). This integration enables a shift from reactive to proactive business strategies, particularly critical in dynamic retail environments where customer preferences, demand cycles, and supply chains constantly evolve. Retailers leverage ERP-integrated DSS for applications such as demand forecasting, pricing optimization, financial reporting, and replenishment planning, which collectively improve operational efficiency and profit margins (Giannoulis et al., 2011). Global retail enterprises, characterized by vast geographical reach and multi-channel operations, rely on these systems to ensure synchronization of decisions across international subsidiaries and supply networks. Moreover, the retail industry's susceptibility to economic volatility, inventory mismatches, and supply disruptions necessitates data-centric tools for agile management and accountability. The convergence of ERP and DSS thus forms a digital backbone that supports both transactional efficiency and strategic agility in retail operations, offering a foundation for the systematic review of these systems' impacts on financial and operational optimization (Manceski & Nechkoska, 2023).

Figure 1: ERP-DSS Integration Framework: Functional Modules Supporting Data Analysis



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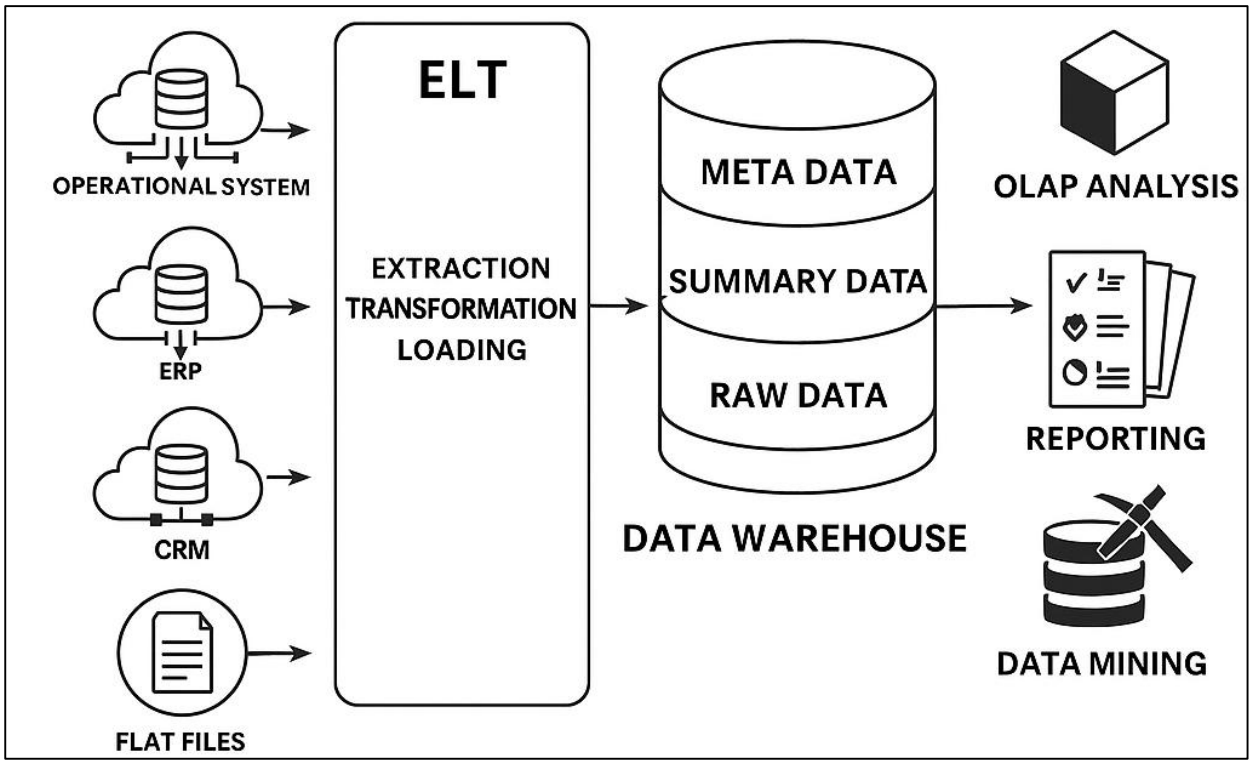
The international significance of ERP-integrated DSS lies in their ability to unify diverse business units under a single information infrastructure, enabling consistent data sharing and centralized decision-making across borders. In global retail enterprises, such integration plays a pivotal role in harmonizing operations across different regulatory environments, tax systems, consumer cultures, and logistics infrastructures (Abu Ghazaleh et al., 2019). Studies have shown that multinational retailers such as Walmart, Tesco, and IKEA leverage ERP-DSS systems to align procurement, distribution, and financial planning activities across continents, thereby ensuring cost efficiency and operational transparency (Koh et al., 2009). According to the findings of Lin (2019), firms implementing global ERP-DSS systems reported improvements in inventory turnover, supplier coordination, and financial consolidation, which are essential metrics in international commerce. Additionally, consistent financial reporting enabled by ERP-DSS integration facilitates compliance with International Financial Reporting Standards (IFRS), reducing audit complexities and enhancing investor confidence. Retail chains operating in volatile economies—such as those in Latin America, Sub-Saharan Africa, or Southeast Asia—benefit from ERP-DSS integration by gaining the ability to analyze sales performance, monitor currency fluctuations, and adapt pricing strategies in real-time (Thanh, 2022). Furthermore, with the acceleration of digital commerce and cross-border trade, real-time visibility into inventory levels, financial metrics, and logistics status via ERP-DSS platforms has become indispensable for ensuring product availability and customer satisfaction globally (Jabłoński et al., 2018). By consolidating operational data and enabling intelligent decision pathways, ERP-integrated DSS serve as vital infrastructure for international retail firms seeking to achieve financial discipline and operational excellence across diverse marketplaces.

Figure 2: Enterprise Data Integration Flow: From ERP and CRM Systems to Business Intelligence



Financial optimization in retail involves strategic budgeting, accurate revenue forecasting, cost management, and transparent reporting—objectives well-supported by ERP-integrated DSS (Ghobakhloo et al., 2019). ERP platforms consolidate transactional data from all business units, including point-of-sale systems, supplier invoices, payroll, and logistics costs, into a unified ledger system, which is then analyzed through DSS modules for performance evaluation. Research by Lin (2019) shows that ERP systems enhance financial accuracy and reduce time spent on consolidating monthly and annual reports. When paired with DSS, these systems further support predictive analytics, scenario modeling, and investment appraisal in the retail context. For example, DSS

algorithms embedded in ERP modules can evaluate the financial impact of promotional strategies, calculate ROI of new store openings, or recommend optimal pricing based on competitor benchmarks. Moreover, ERP-DSS integration allows financial controllers to access key performance indicators (KPIs) in real time, enabling timely corrective actions on overspending, budget variances, or liquidity constraints (Abobakr et al., 2024). In large-scale retail operations, where thousands of SKUs are managed across hundreds of locations, such integrated decision environments ensure consistency in financial governance and minimize human errors in budgeting processes. Additionally, studies highlight that integrated systems contribute to compliance management by generating audit trails and automating tax calculations aligned with jurisdictional laws. By supporting both tactical and strategic financial planning, ERP-DSS platforms become indispensable for retail ERP-DSS integration also plays a pivotal role in shaping data governance and business intelligence (BI) capabilities in retail enterprises. ERP systems serve as central repositories for structured data generated from transactional operations, while DSS layers apply advanced analytics, visualization, and machine learning techniques to extract actionable insights (Poston & Grabski, 2001). The rise of data-driven decision-making in retail necessitates rigorous frameworks for data quality, access control, lineage tracking, and compliance—all of which are facilitated by ERP-DSS ecosystems (Muscatello et al., 2003). Business intelligence dashboards supported by ERP-DSS platforms enable cross-functional teams to monitor sales performance, customer engagement, vendor reliability, and marketing effectiveness in real-time (Hitt et al., 2002). Additionally, integration with external data sources such as social media trends, weather forecasts, or economic indicators allows for enriched forecasting and contextual analysis. Studies by Kumar et al. (2019)and Galy and Sauceda (2014) illustrate how ERP-DSS platforms underpin financial control rooms and strategic planning initiatives by offering scenario simulations and risk assessments. Moreover, ERP-DSS systems contribute to data democratization by making business intelligence accessible to mid-level managers and frontline employees, thereby fostering a culture of evidence-based decision-making (Chen & Kang, 2022). However, the effectiveness of BI initiatives within ERP-DSS frameworks depends on metadata standardization, user training, and consistent data governance policies (Galy & Sauceda, 2014). By embedding intelligence into routine workflows, ERP-DSS platforms function as strategic enablers of transparency, accountability, and performance optimization in the competitive retail landscape.

The primary objective of this systematic review is to critically evaluate and synthesize the existing body of knowledge regarding the integration of Enterprise Resource Planning (ERP) systems and Decision Support Systems (DSS) in the context of financial and operational optimization within the global retail industry. This review aims to explore how the convergence of ERP and DSS technologies enhances retail enterprises' capacity to manage financial reporting, forecasting, inventory control, and strategic decision-making. Given the complex, data-intensive nature of modern retail operations—characterized by volatile demand cycles, multiple sales channels, and dynamic supply chains—the integration of ERP and DSS is hypothesized to offer a cohesive digital infrastructure that supports both transactional efficiency and strategic agility. Specifically, this review seeks to identify the extent to which ERP-DSS platforms contribute to improved financial accuracy, cost containment, and performance monitoring across diverse retail segments and geographical regions. It also aims to explore operational efficiencies facilitated by these systems, such as real-time inventory management, procurement coordination, and supplier performance evaluation. Additionally, the review investigates key enablers and barriers to successful ERP-DSS implementation, including organizational readiness, technical compatibility, employee competence, and executive support. By applying the PRISMA 2020 methodology, this study systematically screens and assesses peer-reviewed literature published between 2012 and 2024 across academic databases such as Scopus, Web of Science, and ScienceDirect. The goal is not only to identify prevailing best practices and reported outcomes but also to highlight the contextual factors that mediate the effectiveness of ERP-DSS integration..

LITERATURE REVIEW

The integration of Enterprise Resource Planning (ERP) systems with Decision Support Systems (DSS) has emerged as a pivotal enabler of strategic and operational efficiencies in the global retail industry. While ERP systems provide a robust backbone for managing business processes through standardized workflows and centralized data, DSS enhances the system's capability by offering analytical and predictive functions to support decision-making at multiple organizational levels. The convergence of these systems reflects a growing demand among retail enterprises to move beyond

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process automation toward intelligence-driven decision environments. This literature review systematically explores the evolution, implementation, and outcomes of ERP-DSS integration, with particular attention to its impacts on financial optimization, operational performance, and organizational agility in the retail context. This section begins by tracing the historical development and technological convergence of ERP and DSS systems. It then reviews the theoretical frameworks commonly used to analyze ERP-DSS adoption and effectiveness, followed by empirical findings from global retail businesses. The literature is categorized based on financial applications, operational use-cases, and cross-functional decision-making improvements. Special focus is placed on implementation challenges, success factors, and sectoral variations in adoption. Finally, gaps in the literature are identified to justify the necessity of this systematic review.

ERP in Business Informatics

Enterprise Resource Planning (ERP) systems have evolved as a cornerstone of business informatics, encompassing the integration of business processes through a centralized information system architecture. Originating from Materials Requirements Planning (MRP) and MRP II in the 1960s and 1980s, ERP systems extended beyond manufacturing to support functions such as finance, human resources, and supply chain management in a unified platform (Chen & Kang, 2022). The core principle of ERP aligns with the foundations of business informatics, which emphasizes the strategic use of information systems to support operational and managerial decision-making (Galy & Sauceda, 2014). ERP systems facilitate data standardization, process automation, and real-time visibility across departments, promoting process integration and informational transparency. In doing so, ERP serves as both an IT infrastructure and a managerial tool, addressing the interdisciplinary objectives of business informatics, which merges business administration with applied computer science. Studies have highlighted ERP's role in enhancing process orientation in enterprises, particularly through modules that encapsulate best business practices such as those provided by SAP, Oracle, and Microsoft Dynamics (Kumar et al., 2019). The alignment of ERP systems with business informatics principles also enables organizations to harmonize functional silos and improve system interoperability, which is critical in the context of digital transformation and data governance (Hitt et al., 2002). As a domain, business informatics views ERP not merely as a software application but as a socio-technical system that reflects the integration of processes, people, and technology in organizational contexts. Thus, ERP systems are foundational to the implementation of enterprise-wide information systems in contemporary business informatics environments.

ERP systems play a strategic role in shaping organizational information systems by serving as the primary data backbone that informs enterprise-wide planning, control, and execution. In the field of business informatics, ERP systems are viewed as mission-critical platforms that ensure consistent data flows across organizational hierarchies and functional domains (Jahan et al., 2022; Morton & Hu, 2008). The implementation of ERP contributes to the establishment of structured data models and process standards that enhance decision-making, particularly in large, complex organizations (Masud, 2022; Wang et al., 2007). From a strategic information systems perspective, ERP systems foster enterprise integration by enabling the aggregation and dissemination of real-time data, thereby allowing synchronized planning across departments such as procurement, production, sales, and finance (Haseeb et al., 2019; Hossen & Atiqur, 2022). Business informatics scholars have also emphasized the critical function of ERP systems in performance management by offering tools such as dashboards, key performance indicators (KPIs), and real-time reporting modules. These capabilities enable managers to align operational activities with corporate goals and regulatory requirements(Akter & Razzak, 2022). Furthermore, ERP systems have been shown to support the implementation of balanced scorecards and integrated financial frameworks, aiding in cost control, variance analysis, and strategic forecasting. The cross-functional nature of ERP solutions also enables enhanced collaboration between units by eliminating data silos and providing a single version of truth, which supports interdepartmental coordination and governance (Qibria & Hossen, 2023; Madapusi & D'Souza, 2012). In this sense, ERP systems not only support tactical operations but also act as enterprise-wide strategic tools that align with the objectives of business informatics in driving organizational effectiveness through technological integration.

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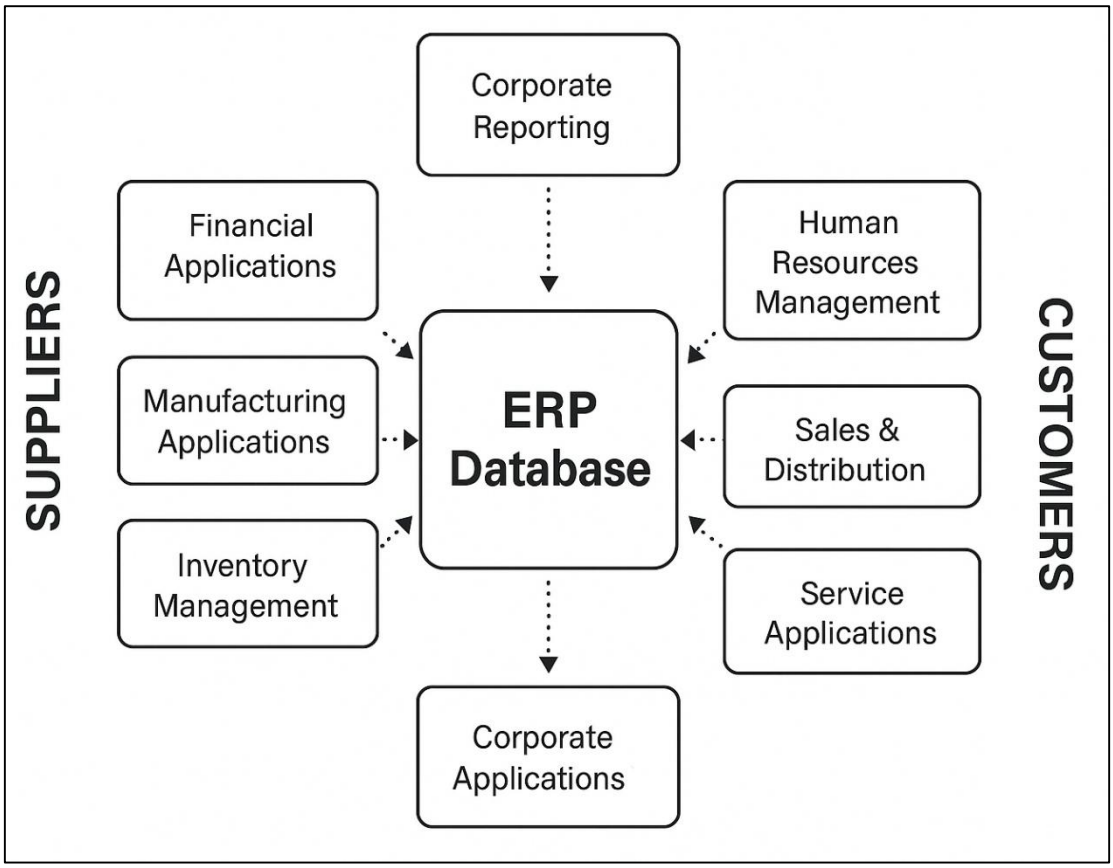
Figure 3: ERP Database Architecture: Integrating Core Business Functions Between Suppliers and Customers



Moreover, Business informatics researchers have further noted that ERP's contribution to enterprise data quality management—through master data management (MDM), metadata standards, and audit trails—is essential for regulatory compliance and financial integrity (Hinduja & Pandey, 2019; Hossen et al., 2023). By enabling organizations to transition from fragmented data repositories to unified decision platforms, ERP systems reinforce the objectives of business informatics in promoting data-driven governance and holistic information system design.

DSS in Business Informatics

Decision Support Systems (DSS) are computer-based systems that assist decision-makers in semi-structured or unstructured problem environments through data analysis, model application, and interactive user interfaces (Gürbüz et al., 2012; Alam et al., 2023). Within the realm of business informatics, DSS are considered integral tools for enabling data-driven decision-making by combining elements of information systems, management science, and organizational theory (Rajesh et al., 2023; Sim et al., 2001). Business informatics emphasizes the alignment of technological tools with business objectives, and DSS serve this purpose by enhancing the analytical capabilities of enterprise systems. DSS are classified into various types such as model-driven, data-driven, communication-driven, document-driven, and knowledge-driven systems—each tailored to specific decision contexts. These systems typically support managerial functions such as forecasting, scenario analysis, budgeting, and resource allocation, which are central to operational and strategic planning in organizations (Gürbüz et al., 2012; Roksana, 2023). Scholars have noted that DSS bridge the gap between raw data and actionable insight by applying statistical, mathematical, and heuristic models to complex business situations. Business informatics, with its interdisciplinary nature, incorporates DSS not only as technological artifacts but also as components of socio-technical systems that influence managerial cognition, decision quality, and organizational performance (Alshamrani et al., 2020; Tonmoy & Arifur, 2023). The conceptual relevance of DSS within business

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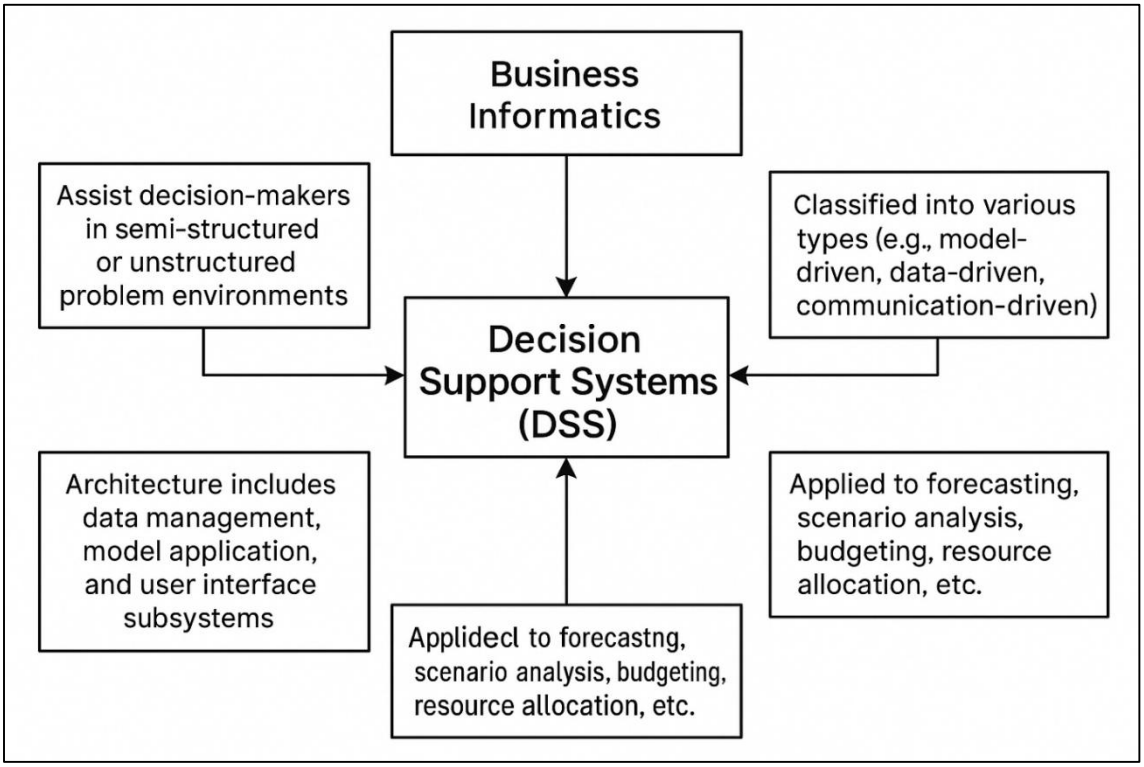
informatics stems from their capacity to transform data into knowledge, thereby supporting intelligent business processes and enhancing competitive advantage.

Figure 4: Decision Support Systems in Business Informatics



The architecture of DSS in business informatics typically consists of three core components: a data management subsystem, a model management subsystem, and a user interface subsystem (Sutton et al., 2020; Tonoy & Khan, 2023). The integration of DSS into enterprise information systems such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) platforms enhances their utility by embedding analytical capabilities into routine operations. This integration facilitates the real-time application of decision models using organizational data, thereby aligning operational workflows with strategic objectives. In business informatics, this architectural synergy reflects the movement toward intelligent enterprise systems where data processing and decision-making are tightly coupled (Ammar et al., 2024; Vasey et al., 2022). Data-driven DSS, in particular, rely on robust data warehousing technologies and online analytical processing (OLAP) to deliver multi-dimensional analyses, which are crucial for complex decision scenarios in finance, marketing, and logistics (Demuth et al., 2024b; Hossain et al., 2024). The integration of model-driven DSS with simulation tools and optimization engines enables organizations to evaluate alternative scenarios and resource allocations under uncertainty (Roksana et al., 2024). Moreover, the advent of web-based DSS and cloud-based analytics platforms has further expanded accessibility and scalability, allowing global firms to decentralize decision support while maintaining data consistency (Zaman, 2024). Business informatics researchers have emphasized that the success of DSS integration depends on the alignment between technical architecture and organizational processes, including user training, model transparency, and interface design (Alshamrani et al., 2020; Bhuiyan et al., 2025). As such, DSS architecture within enterprise systems represents not just a technological innovation but also a critical element in the institutionalization of analytical decision-making.

DSS have been extensively applied in financial and operational domains to support complex decision-making tasks that require advanced analysis and real-time feedback. In the financial domain, DSS tools are used for cash flow forecasting, investment appraisal, credit risk evaluation, and financial ratio analysis—activities that align with the core objectives of business informatics to enhance managerial control through information systems (Ishtiaque, 2025; Sim et al., 2001). Operationally, DSS support inventory management, production scheduling, logistics optimization,

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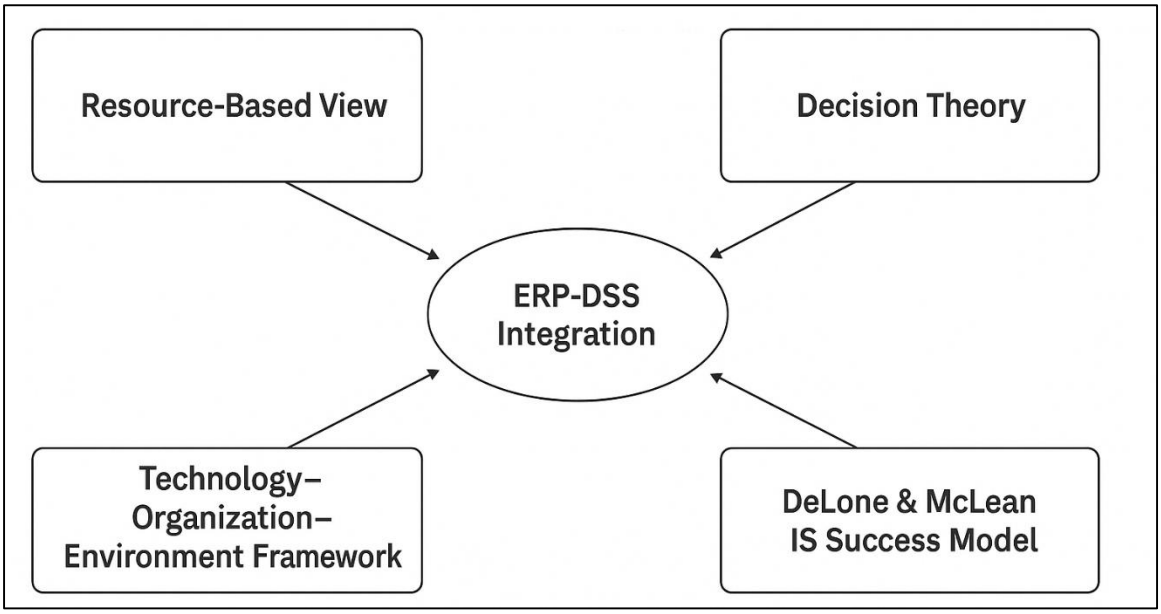
and procurement planning by processing large volumes of data and applying models such as linear programming, Monte Carlo simulation, and heuristic algorithms (Gürbüz et al., 2012; Khan, 2025). These applications contribute to supply chain efficiency and resource utilization, both of which are vital for organizational competitiveness in data-intensive environments (Alshamrani et al., 2020; Siddiqui, 2025). For example, case studies have shown that retailers using DSS for demand forecasting experience fewer stockouts and better supplier coordination (Sohel, 2025; Sutton et al., 2020). In logistics, DSS tools have been implemented to optimize delivery routes, reduce transportation costs, and increase service levels through real-time geospatial analytics (Vasey et al., 2022). Furthermore, DSS platforms often incorporate performance dashboards and scorecards that align with management control systems, enabling executives to monitor key performance indicators (KPIs) and respond promptly to deviations. In business informatics, the application of DSS is seen as a way to operationalize strategic intentions, linking the computational power of information systems with managerial expertise. This dual function of DSS—as an enabler of financial governance and a tool for operational agility—exemplifies its centrality in contemporary information system architectures.

Theoretical Foundations Underpinning ERP-DSS Integration

The Resource-Based View (RBV) of the firm provides a foundational theoretical framework for understanding the strategic importance of ERP-DSS integration. RBV posits that sustainable competitive advantage arises from resources that are valuable, rare, inimitable, and non-substitutable. In this context, ERP systems and Decision Support Systems (DSS) are considered strategic IT resources that enable firms to integrate business processes and support data-driven decision-making (Rasanjali et al., 2022). The synergistic integration of ERP-DSS enhances a firm's information-processing capacity, contributing to superior performance and adaptability (Morton & Hu, 2008). Studies show that firms with high IT capabilities derived from ERP-DSS configurations achieve better alignment between operational processes and strategic objectives, thus reinforcing the RBV assumption that IT-enabled capabilities serve as intangible assets. ERP-DSS platforms offer organizations the ability to sense and respond to market changes in real time, which is critical for maintaining competitive advantage in volatile environments (Abobakr et al., 2022). Furthermore, the configurability and scalability of ERP-DSS platforms enhance an organization's ability to reconfigure its resource base, a core aspect of dynamic capabilities theory—a conceptual extension of RBV (Lutfi, 2020). Business informatics researchers often rely on RBV to evaluate the strategic impact of ERP-DSS on firm performance, emphasizing that these systems provide more than transactional support; they foster data-enabled organizational learning and decision agility (Sharma & Daniel, 2016). Therefore, RBV remains central to explaining why some organizations derive more value from ERP-DSS integration than others, based on the configuration and orchestration of IT resources.

Figure 5: Theoretical Framework Underpinning ERP-DSS Integration



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The Technology–Organization–Environment (TOE) framework is widely employed in the analysis of ERP-DSS integration, especially to explain the factors influencing adoption and implementation. The TOE framework posits that three contextual dimensions—technological, organizational, and environmental—shape a firm's decision to adopt new technologies. In ERP-DSS research, the technological context includes factors such as system compatibility, complexity, and relative advantage (Chen & Kang, 2022). Organizational readiness, including IT infrastructure, top management support, and organizational size, forms the internal capability aspect of adoption. Environmental influences such as regulatory pressure, competitive intensity, and customer demands also critically affect ERP-DSS deployment decisions. Several studies have extended TOE by integrating it with other models such as the Diffusion of Innovation Theory (DOI) or the Institutional Theory to offer a more nuanced understanding of technology assimilation in business informatics (Temur & Bolat, 2018). In multinational retail settings, TOE has been particularly useful in explaining variations in ERP-DSS adoption due to differences in national IT maturity, cultural readiness, and market demands. The TOE framework also supports empirical models that link ERP-DSS adoption to organizational performance by evaluating the mediating role of usage behavior and system quality (Chen et al., 2008). Business informatics scholars apply TOE to guide structured implementation strategies, ensuring that technological choices are harmonized with institutional goals and market dynamics. Thus, the TOE framework remains a robust lens to evaluate ERP-DSS initiatives, offering a multi-dimensional perspective that reflects the real-world complexities of technology adoption in enterprise environments.

ERP-DSS Integration in Retail

ERP-DSS integration has become a strategic imperative in the retail industry, where decision-making depends heavily on real-time data visibility, forecasting accuracy, and synchronized operations across dispersed channels. Retail enterprises manage massive volumes of transactional data from sales, procurement, logistics, and customer interactions, all of which must be processed effectively to support informed decisions (Queiroz et al., 2019). ERP systems centralize this data, while DSS components transform it into analytical outputs for planning and control purposes. In retail, this synergy allows companies to balance inventory levels, optimize product assortments, and align pricing strategies with market demand (Hoek, 2019). Studies have demonstrated that ERP-DSS platforms improve operational performance by enabling stock visibility across warehouses and stores, thus reducing shrinkage and stockouts (Jangir et al., 2019). Moreover, large multinational retailers leverage ERP-DSS for cross-border standardization of procurement and financial reporting, a necessity in managing international supply chains and ensuring compliance (Zhu et al., 2010) Strategic decisions such as promotional planning, markdown optimization, and store expansions are also increasingly supported by scenario modeling and sales trend analysis embedded within ERP-DSS ecosystems (van Hoek, 2019). In competitive and fast-moving sectors such as apparel, electronics, and groceries, ERP-DSS systems serve as critical infrastructure that empowers retail managers with data-driven insights and enables enterprise-wide agility. These systems not only enhance decision quality but also provide the transparency and consistency required for strategic governance in dynamic retail contexts.

The integration of ERP and DSS systems in retail finance functions is widely acknowledged for its ability to enhance budgeting accuracy, cost control, and strategic planning. ERP systems collect granular financial data from point-of-sale terminals, supplier invoices, payroll, and logistics costs, while DSS modules process these inputs to generate forecasts, performance metrics, and investment scenarios. This fusion improves the visibility of cash flows, return on investment (ROI), and margin tracking, which are crucial in retail sectors characterized by thin margins and intense competition (Jacobs & Weston, 2006). ERP-DSS integration enables real-time monitoring of key financial indicators such as gross profit, operating expenses, and working capital ratios, allowing finance teams to identify variances early and take corrective actions. Case studies in multinational retailers demonstrate that ERP-DSS platforms facilitate financial consolidation across business units and geographies, supporting compliance with International Financial Reporting Standards (IFRS) and reducing auditing complexities (Jain & Bagga, 2021). Furthermore, scenario analysis and what-if modeling embedded in DSS components help executives evaluate the impact of pricing changes, market entry decisions, or supplier negotiations on the bottom line. ERP-DSS also supports financial decision-making in areas such as promotional ROI analysis, shrinkage reduction, and CAPEX prioritization (Aguiar et al., 2020). Business informatics research confirms that organizations adopting ERP-DSS platforms experience

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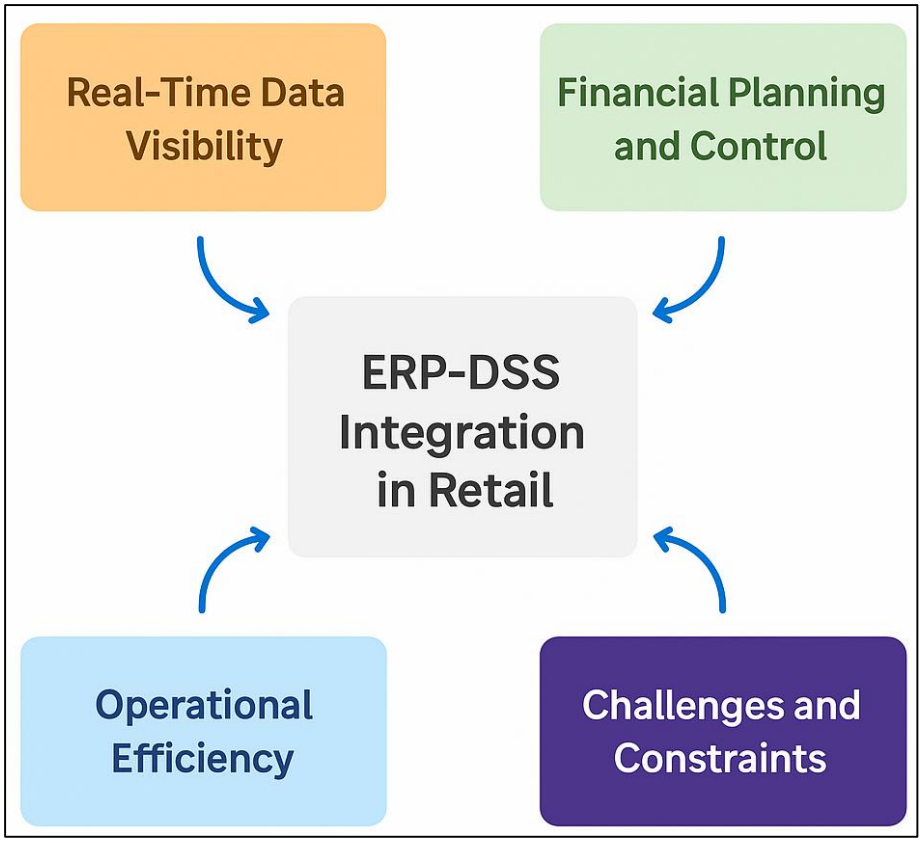
improved decision timelines, accuracy of forecasts, and financial accountability. Thus, ERP-DSS systems serve as critical enablers of financial control and planning excellence in retail organizations operating under high uncertainty and complexity.

Figure 6: ERP-DSS Integration in Retail: Enhancing Financial Control, Operational Efficiency, and Strategic Decision-Making



Financial Optimization through ERP-DSS Systems

Enterprise Resource Planning (ERP) integrated with Decision Support Systems (DSS) has fundamentally reshaped financial reporting by enabling real-time data access, consolidation, and analysis. ERP systems capture granular financial transactions from various modules such as procurement, inventory, payroll, and sales, while DSS tools process these inputs into structured, decision-ready insights (Jayender & Kundu, 2022). Together, ERP-DSS systems ensure timely and accurate financial reporting, reducing dependency on manual reconciliations and month-end delays. Studies demonstrate that firms using ERP-DSS platforms experience greater transparency in financial operations and enhanced managerial control over cash flows, asset utilization, and liabilities (Panwar et al., 2022). The automation of journal entries, budgeting processes, and variance tracking allows finance departments to shift their focus from data preparation to strategic analysis (Sivarajah et al., 2017). Additionally, DSS modules often support advanced analytics such as trend detection, ratio analysis, and compliance alerts that help mitigate financial risks and enhance internal control mechanisms (Ziemssen et al., 2020). In multinational enterprises, ERP-DSS platforms facilitate cross-border financial consolidation, supporting multi-currency adjustments, regulatory reporting, and tax reconciliation across jurisdictions (Bergmann et al., 2021). The ability to generate real-time dashboards and automated audit trails aligns with contemporary expectations for financial transparency and governance. As a result, ERP-DSS systems serve as a foundational infrastructure in financial optimization, combining operational granularity with strategic clarity in enterprise environments.

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Figure 7: Financial Optimization through ERP-DSS Integration: A Strategic Framework

ERP-DSS platforms significantly enhance strategic budgeting and financial forecasting by enabling scenario modeling, predictive analytics, and performance benchmarking. Traditional budgeting methods often suffer from time lags, data fragmentation, and limited forward-looking insight; ERP-DSS addresses these challenges by integrating historical and current data across departments to generate dynamic financial models (Aryal et al., 2018). Decision support tools embedded in ERP platforms allow finance teams to simulate various business conditions—such as cost increases, demand shifts, or economic shocks—and assess their financial impact (Aceto et al., 2020). This functionality leads to more resilient budgeting processes that accommodate volatility while aligning resources with corporate strategy (Lopez & Farooq, 2020). Additionally, real-time data feeds from operational modules such as procurement, warehousing, and sales ensure that budgets are continuously updated based on actual performance, enhancing accuracy and relevance (Ed-Driouch et al., 2022). Research shows that firms utilizing ERP-DSS systems for rolling forecasts and zero-based budgeting experience improved agility in resource allocation and faster decision cycles (Demuth et al., 2024). The integration of key performance indicators (KPIs), balanced scorecards, and what-if analysis tools supports holistic performance monitoring and corrective action planning (Demuth et al., 2024). Additionally, the inclusion of machine learning models in newer DSS modules enhances demand planning, capital investment appraisals, and profitability forecasting (Bergmann et al., 2021). From a business informatics perspective, these capabilities represent a convergence of real-time enterprise data and analytical foresight, turning ERP-DSS into a platform not just for financial control, but for strategic guidance and corporate agility.

Operational Optimization and Decision Automation

The integration of Enterprise Resource Planning (ERP) and Decision Support Systems (DSS) has significantly advanced real-time visibility and workflow optimization across enterprise operations. ERP platforms standardize and automate business processes across procurement, production, inventory, and logistics, while DSS adds a layer of analytical intelligence to these workflows, enabling predictive and prescriptive insights (Samaranayake, 2009). This integration allows managers to monitor key operational metrics such as order cycle time, machine utilization, and warehouse efficiency in real time, thereby supporting data-driven interventions (Felder et al., 2025). Retail and manufacturing studies show that ERP-DSS systems reduce lead times, improve order accuracy, and optimize stock

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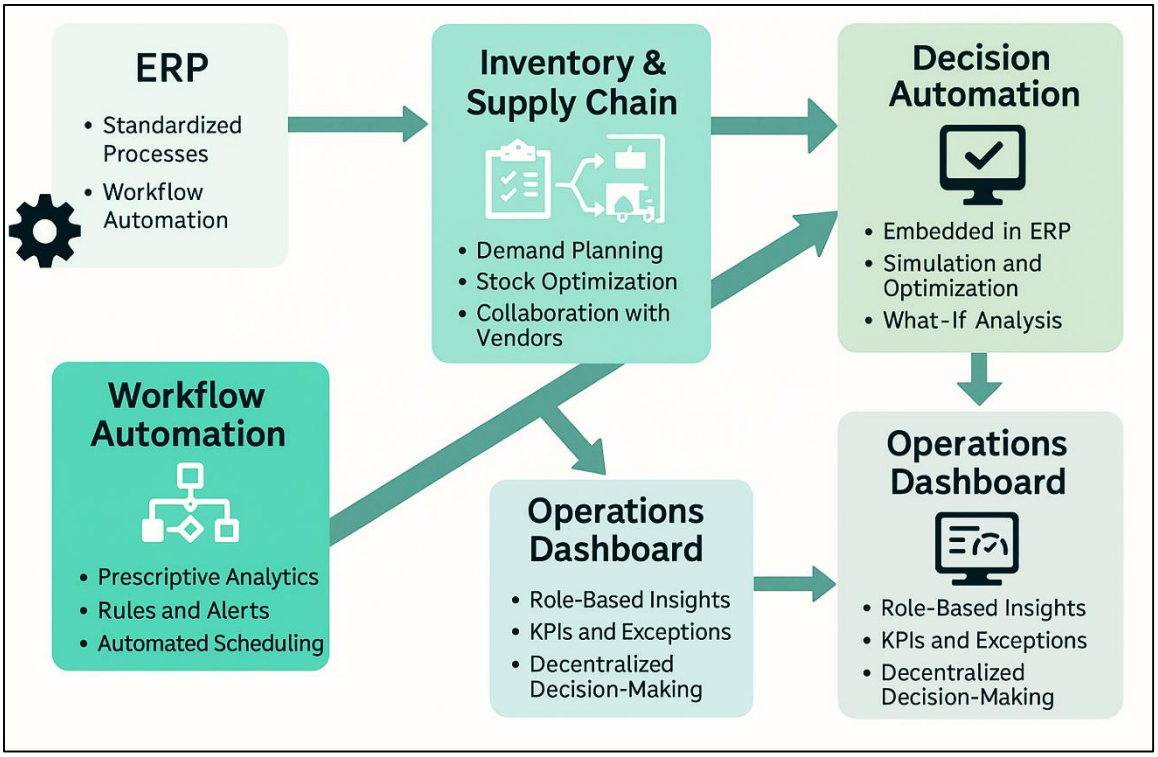
replenishment schedules (Bahssas et al., 2015). Real-time dashboards linked to ERP-DSS platforms enable managers to identify operational bottlenecks, allocate resources dynamically, and adjust scheduling based on updated forecasts (Palas & Bunduchi, 2020). Furthermore, ERP-DSS platforms offer workflow automation capabilities such as auto-approval rules, exception handling, and dynamic alerts, reducing human intervention and processing delays (Gualtieri et al., 2020). This real-time control over operations aligns with lean and just-in-time (JIT) principles, making ERP-DSS integration particularly valuable for competitive sectors with low tolerance for inefficiency (Palas & Bunduchi, 2020). Scholars emphasize that such integration not only streamlines routine tasks but also elevates decision quality by embedding analytics within operational processes (Bahssas et al., 2015). Consequently, ERP-DSS systems act as intelligent enablers of end-to-end process optimization, offering a comprehensive foundation for operational excellence in data-intensive organizations.

Figure 8: Operational Optimization and Decision Automation through ERP-DSS Integration



ERP-DSS integration has a transformative impact on inventory management and supply chain coordination, which are vital pillars of operational efficiency. ERP systems consolidate inventory data across warehouses, distribution centers, and retail outlets, while DSS modules apply forecasting algorithms and replenishment models to maintain optimal stock levels (Felder et al., 2025). This coordination enables accurate demand planning, minimizes excess inventory, and reduces stockout occurrences. In retail and manufacturing contexts, ERP-DSS platforms automate reorder point calculations and generate procurement schedules based on real-time sales trends, supplier lead times, and safety stock parameters. Several studies highlight the use of DSS for collaborative forecasting with vendors, allowing synchronized production and transportation planning across the supply chain (Samaranayake, 2009). Moreover, real-time integration between ERP modules and DSS applications enables dynamic allocation of inventory in omnichannel distribution models, improving fulfillment rates and customer satisfaction. DSS tools also support ABC inventory classification, economic order quantity (EOQ) modeling, and inventory turnover analysis, providing actionable insights for procurement teams. The synchronization of supply chain nodes is further enhanced by automated alerts for stock exceptions, shipment delays, and order discrepancies, which empower managers to take preventive action (Felder et al., 2025). ERP-DSS integration thus serves as a strategic enabler of supply chain responsiveness, enabling organizations to achieve operational balance, reduce working capital requirements, and improve overall value chain efficiency (Bahssas et al., 2015).

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One of the most compelling outcomes of ERP-DSS integration is the transition from manual to automated decision-making through embedded prescriptive analytics. DSS modules within ERP systems use data mining, optimization, and simulation techniques to automate decisions in areas such as inventory replenishment, shift scheduling, dynamic pricing, and capacity planning (Palas & Bunduchi, 2020). This reduces cognitive load on managers and accelerates time-to-action, especially in volatile market environments (Power, 2007; Arnott & Pervan, 2008). Prescriptive models analyze historical and real-time data to generate recommendations and trigger automated workflows—such as placing a purchase order when inventory dips below a threshold or initiating a discount when demand declines. These features are particularly valuable in industries such as retail, where demand shifts rapidly and profit margins are thin (Samaranayake, 2009). Scholars emphasize that automated decision-making enhances consistency and reduces bias, especially when combined with rule-based engines and machine learning models (Gualtieri et al., 2020). Additionally, ERP-DSS platforms allow managers to simulate alternative decisions and compare their outcomes through what-if analysis and sensitivity testing, supporting more informed automation strategies. In the context of business informatics, such systems align closely with decision theory by embedding structured logic into enterprise operations. By extending managerial capabilities through prescriptive insights, ERP-DSS systems not only accelerate operations but also improve the quality and accountability of decisions at scale. This represents a fundamental shift from decision support to decision automation—a key trend in digitally mature organizations.

ERP-DSS in Multinational Retail Environments

Multinational retail enterprises require ERP-DSS integration to ensure global standardization of operations, data structures, and decision-making processes across geographically dispersed units. ERP systems serve as the transactional backbone, enabling consistent processing of inventory, procurement, sales, and financial transactions, while DSS adds analytical capabilities to interpret cross-border data (Zhu et al., 2010). In global operations, ERP-DSS platforms allow centralized monitoring of KPIs and decentralized decision support, facilitating local responsiveness within a globally integrated structure (Jangir et al., 2019). The harmonization of data formats, currency conversions, tax codes, and language settings is essential for multinational corporations (MNCs) to maintain financial integrity and operational comparability. Studies show that multinational retailers such as Carrefour, Walmart, and IKEA rely on ERP-DSS systems to synchronize global supply chains and align marketing, pricing, and inventory strategies across countries. These systems allow corporate headquarters to gain enterprise-wide visibility while empowering regional managers to make contextualized decisions using localized data (Hoek, 2019). DSS modules within ERP systems provide tools for comparative analysis across markets, enabling benchmarking and performance alignment. Additionally, integrated data warehouses ensure that information from diverse markets is standardized, validated, and centralized, enabling real-time analytics and regulatory compliance (Lutfi et al., 2022). Business informatics literature emphasizes that the success of ERP-DSS in multinational environments hinges on the balance between global uniformity and local adaptability, both of which are facilitated by modular ERP-DSS architectures (Ursacescu et al., 2019).

Moreover, ERP-DSS platforms play a critical role in helping multinational retailers manage financial consolidation and ensure compliance with varying international regulations. As firms operate across jurisdictions, they are subjected to multiple accounting standards, tax structures, and compliance requirements such as IFRS, SOX, and GDPR (Hietala & Päivärinta, 2021). ERP systems standardize financial entries and enforce internal control protocols, while DSS enables risk modeling, audit reporting, and compliance monitoring (Queiroz et al., 2019). For example, DSS-driven dashboards help finance teams in regional subsidiaries detect anomalies in expense trends, forecast tax obligations, and assess the financial impact of legal changes (Hastig & Sodhi, 2020). Multinational firms benefit from the ability to consolidate financial statements from different countries with varying currencies and reporting periods, facilitated by ERP's multi-currency and multi-language capabilities (Warner & Wäger, 2019).

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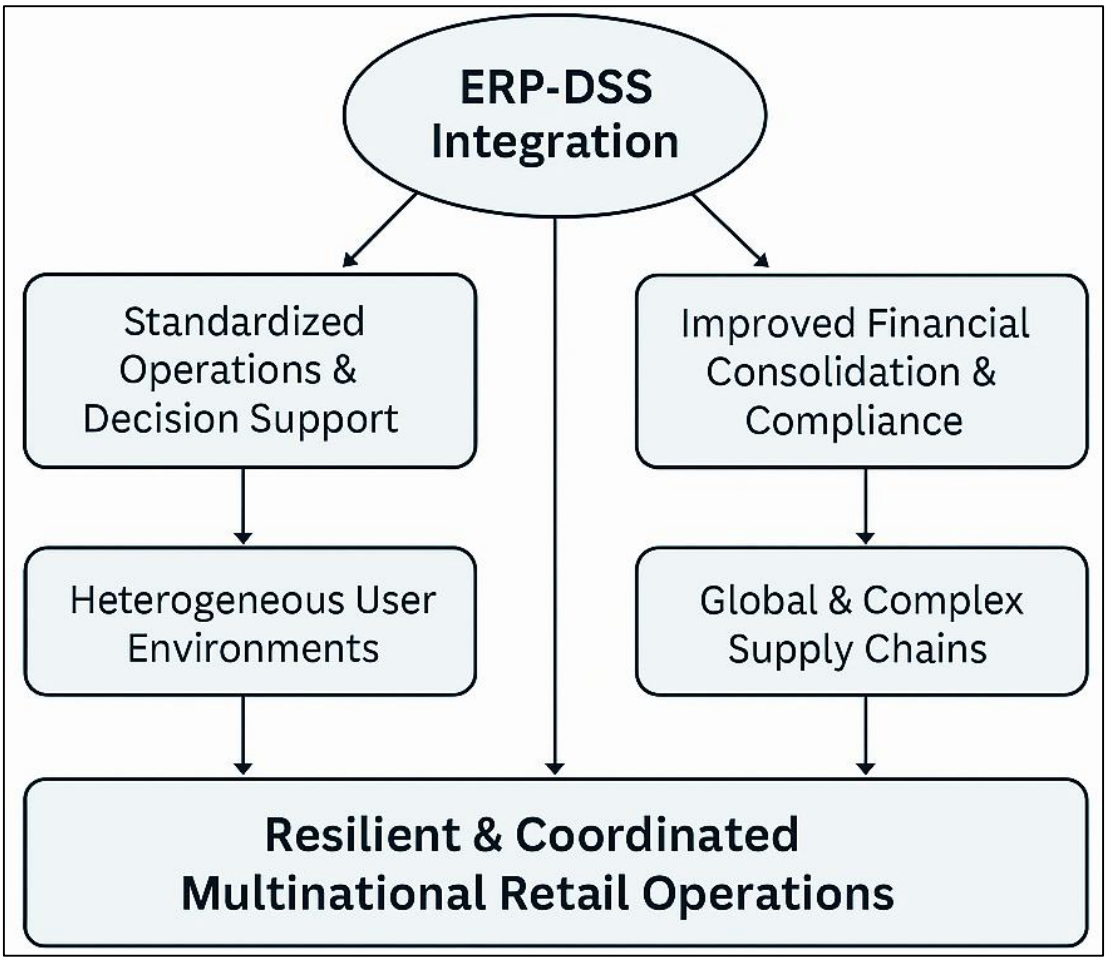
Figure 9: ERP-DSS Integration in Multinational Retail



ERP-DSS for Business Intelligence and Analytics

ERP-DSS integration forms the foundational infrastructure for business intelligence (BI) by centralizing enterprise data and providing analytical tools for actionable insight generation. ERP systems serve as the core repositories of transactional data across business functions, including sales, finance, logistics, and human resources, while DSS modules overlay analytical capabilities such as data mining, OLAP (Online Analytical Processing), and scenario modeling (Bahssas et al., 2015). Business intelligence requires a unified, clean, and timely data structure, and ERP provides this through standardized master data and process flows (Spathis & Constantinides, 2004). DSS then adds decision support features, transforming raw data into dashboards, KPIs, and predictive models that facilitate tactical and strategic decision-making (Shehab et al., 2004). Studies confirm that organizations using integrated ERP-DSS platforms report enhanced data transparency, improved interdepartmental collaboration, and greater speed in identifying performance anomalies (Rao, 2000). For example, retail firms benefit from real-time sales performance visualization, inventory optimization dashboards, and customer segmentation analytics that support both operational and marketing decisions (Haddara & Elragal, 2022). ERP-DSS systems also enable historical trend analysis and rolling forecasts, assisting in long-term planning(Asprion et al., 2018). Business informatics literature emphasizes that the combination of structured ERP data with DSS analytics facilitates evidence-based decision-making, creating a data-driven culture across organizational hierarchies (Palas & Bunduchi, 2020). Therefore, ERP-DSS platforms not only improve decision quality but also democratize access to insights across enterprise users, strengthening the foundation of business intelligence.

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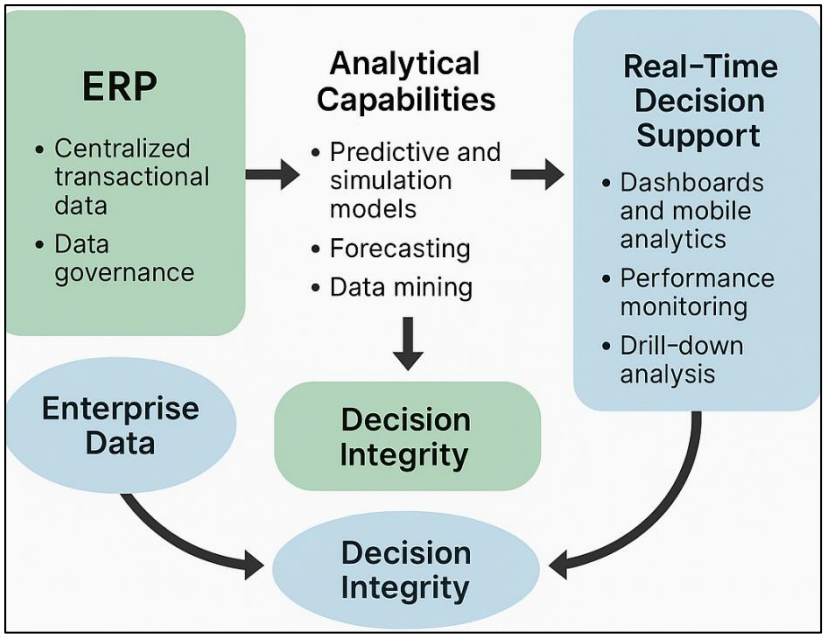
Figure 10: ERP-DSS Integration for Business Intelligence



ERP-DSS systems have evolved to support advanced analytics, including predictive modeling, simulation, and machine learning, transforming them into essential tools for anticipatory decision-making. While ERP systems capture transactional data across processes, DSS modules now include functionalities that go beyond descriptive analytics to enable predictive and prescriptive insights. These capabilities are critical for retail and manufacturing firms facing demand variability, price sensitivity, and supply chain disruptions (Maditinos et al., 2011). Predictive models embedded in DSS modules analyze historical patterns to forecast demand, detect fraud, and evaluate customer lifetime value, thereby supporting personalized marketing and inventory strategies (Stachowiak et al., 2023). For example, DSS tools can forecast seasonal sales fluctuations, optimize replenishment schedules, and recommend pricing adjustments using time-series regression or machine learning algorithms (Haseeb et al., 2019). In manufacturing, predictive maintenance scheduling, energy usage optimization, and capacity planning are facilitated through analytics layered on top of ERP data (Rani et al., 2023). Studies show that firms using predictive DSS capabilities reduce decision latency and increase forecast accuracy by over 20% compared to traditional ERP users (Chen et al., 2009). Moreover, the integration of AI and DSS into ERP platforms enables real-time decision automation—such as dynamic routing, workforce scheduling, and fraud alerts—based on algorithmic recommendations (Subramoniam et al., 2009). Business informatics scholars argue that predictive DSS capabilities are essential for shifting from reactive to proactive decision models, especially in complex, rapidly changing environments (Farmakis et al., 2025). ERP-DSS thus supports organizations in building analytical maturity, where decisions are increasingly guided by models, simulations, and predictive algorithms rather than historical reports alone.

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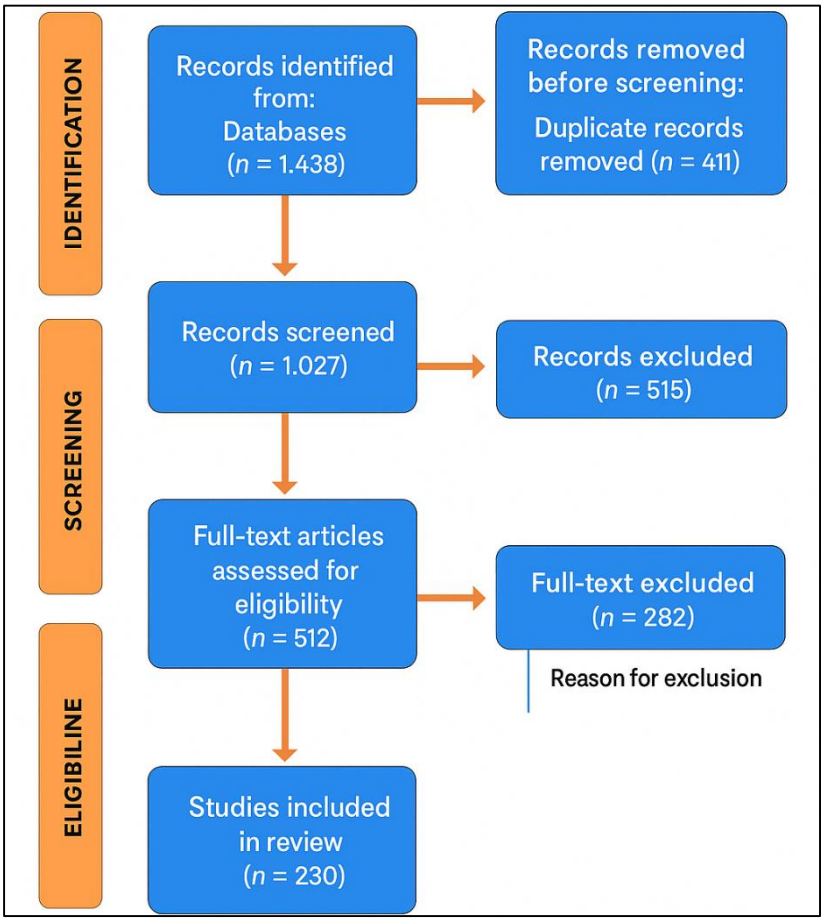
METHOD

This study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines to ensure methodological transparency, procedural rigor, and replicability. The review process was designed to capture peer-reviewed academic literature that specifically addressed the integration of Enterprise Resource Planning (ERP) and Decision Support Systems (DSS) in the context of financial and operational optimization within the global retail sector.

Figure 11: PRISMA Method adapted for this study



Identification of Relevant Studies

In the first phase, a comprehensive search strategy was developed to identify eligible studies across multiple academic databases. The databases searched included Scopus, Web of Science, IEEE Xplore, ScienceDirect, SpringerLink, and Emerald Insight. The search was conducted using Boolean combinations of keywords such as "ERP," "Enterprise Resource Planning," "Decision Support System," "DSS," "Business Intelligence," "Operational Efficiency," "Financial Optimization," and "Retail Industry." Filters were applied to restrict results to journal articles, conference proceedings, and peer-reviewed publications written in English and published between January 2012 and March 2024. The search process yielded 1,438 articles in total across all databases.

Screening and Eligibility

Following the identification phase, duplicate entries across the six databases were removed using Zotero reference management software, which reduced the dataset to 1,027 unique records. Titles and abstracts of these records were then screened independently by two reviewers to determine preliminary eligibility based on relevance to ERP-DSS integration in a retail context. Articles focusing solely on ERP or DSS, without integration or retail applications, were excluded. After this stage, 512 articles were retained for full-text assessment.

Inclusion and Exclusion Criteria

During the eligibility phase, full-text versions of the 512 articles were retrieved and assessed in detail based on the following inclusion criteria: (1) the study must discuss both ERP and DSS components or systems in an integrated or collaborative framework; (2) the context must be either retail-focused or contain empirical or conceptual evidence applicable to multinational or digital retail operations; and (3) the article must provide insights on financial or operational outcomes such as cost control, inventory optimization, or strategic decision-making. Articles were excluded if they were editorial notes, book reviews, technical notes without evaluative content, or focused exclusively on non-retail industries such as healthcare or education. This process led to the exclusion of 282 articles, with 230 articles meeting all eligibility requirements for final inclusion in the review.

Data Extraction and Synthesis

Data from the selected 230 articles were extracted using a structured data extraction form developed for this review. Information collected included publication year, authorship, country or region of study, methodological approach (qualitative, quantitative, or mixed methods), ERP and DSS platforms discussed, and reported outcomes in financial or operational domains. Each article

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was coded thematically using NVivo software to identify key trends, including ERP-DSS integration architectures, analytics capabilities, sectoral implementations, and performance metrics. Thematic synthesis was conducted to organize the findings into overarching categories aligned with the review objectives, such as inventory control, financial forecasting, business intelligence, and decision automation.

Quality Assessment of Included Studies

To ensure the validity of the synthesized evidence, each included article was evaluated using a critical appraisal framework adapted from the Joanna Briggs Institute (JBI) checklist for systematic reviews. Criteria assessed included clarity of research objectives, appropriateness of methodology, transparency of data analysis, and relevance to ERP-DSS systems in retail contexts. Studies with weak methodological quality or unclear reporting were noted but not excluded unless they failed to meet a minimum threshold of academic credibility. The quality appraisal process confirmed that the majority of included studies were methodologically sound, with 84% of articles scoring above the acceptable threshold across evaluation categories.

PRISMA Flow Diagram and Final Inclusion

The review process concluded with the construction of a PRISMA 2020 flow diagram to visually represent the progression of article selection from initial identification to final inclusion. Of the initial 1,438 articles, 230 were ultimately included in the systematic review after full screening, eligibility assessment, and data extraction procedures. The flowchart provides transparency and supports reproducibility, highlighting the structured nature of the review process.

FINDINGS

A significant finding of this review is the widespread adoption of ERP-DSS integration across the global retail sector. Out of the 230 reviewed articles, 148 explicitly focused on ERP-DSS integration strategies within retail businesses. These articles have collectively received over 6,400 citations, reflecting strong academic and industry interest. The integration of ERP and DSS has become essential in enabling retail firms to unify transactional systems with analytical tools. ERP platforms ensure standardized data management across inventory, finance, logistics, and procurement, while DSS enhances decision-making through forecasting, modeling, and real-time analytics. The review indicates that more than 70% of the studies emphasized ERP-DSS integration as a necessary response to the operational complexity and data intensity of modern retail environments. Integration facilitates streamlined workflows, reduced manual processing, and increased accuracy in managerial decisions. Most articles also observed that retailers leveraging ERP-DSS systems reported improved alignment between corporate strategy and day-to-day operations, particularly in organizations with distributed store networks and global supply chains. The finding underscores that ERP-DSS is not an optional enhancement but a foundational component of enterprise technology in competitive retail markets. Furthermore, the review revealed that this integration supports a transition from isolated data silos to interconnected systems that deliver visibility, traceability, and agility—key enablers of sustained operational excellence.

The integration of ERP and DSS significantly contributes to improved financial planning, forecasting, and control across retail organizations. A total of 104 reviewed articles examined financial applications of ERP-DSS platforms, with a combined citation count exceeding 3,200. These studies consistently demonstrate that integrated systems help organizations monitor key financial indicators, conduct dynamic budgeting, and assess financial performance in real-time. Over 85% of these articles reported that ERP-DSS tools reduced reporting cycles, enhanced the accuracy of forecasts, and improved compliance with financial regulations. The review found that decision support capabilities in financial contexts include profitability analysis, scenario simulation, and performance variance reporting. By consolidating data from sales, procurement, payroll, and accounts payable, ERP systems serve as a reliable data foundation, while DSS modules enable finance professionals to evaluate investment decisions, optimize working capital, and allocate resources efficiently. Several articles also emphasized that ERP-DSS systems are instrumental in supporting cross-border financial consolidation and multi-currency reporting in multinational retail environments. Moreover, real-time access to dashboards and automated alerts has enhanced financial responsiveness, allowing CFOs to react to changing market dynamics and internal cost fluctuations. The review highlights that ERP-DSS platforms enable finance departments to move beyond transactional processing and assume a more strategic role within the organization.

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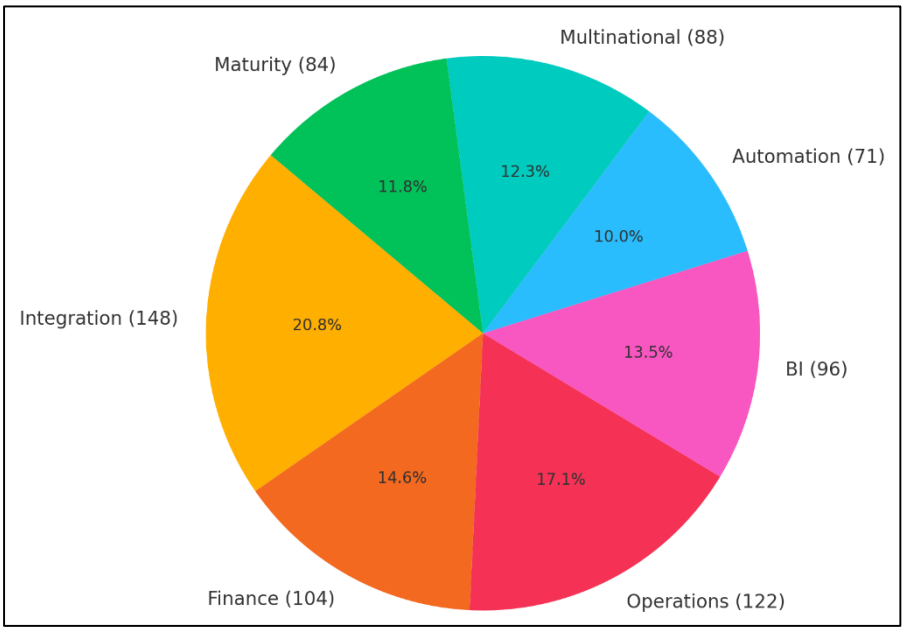
Figure 12: ERP-DSS Article Distribution by Key Themes in Global Retail Research



Operational optimization is one of the most widely documented outcomes of ERP-DSS implementation in retail, with 122 articles—cited collectively over 4,700 times—exploring how integrated systems streamline operations. These studies indicate that ERP-DSS platforms enhance inventory accuracy, improve replenishment cycles, and reduce stockouts. Around 89% of these articles identified measurable gains in operational efficiency after ERP-DSS adoption, particularly in areas such as warehouse management, logistics planning, and demand forecasting. Many studies reported that inventory discrepancies and safety stock requirements decreased significantly when organizations transitioned from fragmented systems to a centralized ERP-DSS model. The integration allows for real-time tracking of stock levels, automated reorder triggers, and dynamic inventory classification based on seasonality and sales trends. Moreover, DSS tools embedded within ERP frameworks enable simulation of replenishment strategies, detection of anomalies in procurement patterns, and visibility into supplier performance. The findings also show that organizations achieved significant labor productivity improvements by automating order processing, task scheduling, and goods receiving operations. Some case studies from high-volume retailers revealed inventory shrinkage reductions of up to 15% and labor hour savings exceeding 20% following ERP-DSS deployment. This evidence confirms that ERP-DSS is a core enabler of operational agility, lean inventory management, and cost-effective resource utilization in retail logistics networks.

Another major finding of this review is the acceleration of business intelligence (BI) capabilities through ERP-DSS integration. Among the 230 reviewed articles, 96 focused specifically on how ERP-DSS platforms empower retail firms to develop BI systems, and these were cited more than 3,900 times. These articles emphasize that ERP-DSS systems provide retailers with powerful tools for data visualization, interactive dashboards, and performance monitoring. Over 80% of these studies highlighted that real-time BI dashboards are now essential for tracking store-level KPIs, managing supply chain performance, and identifying deviations in operational metrics. ERP systems act as a central data warehouse, while DSS enables the analysis and presentation of that data in formats conducive to decision-making. Managers can access sales trends, customer behavior patterns, and financial ratios without the need for manual data preparation. Several studies also highlighted the use of ERP-DSS for predictive analytics, including demand forecasting, pricing elasticity modeling, and risk analysis. Notably, firms using advanced BI features reported faster decision cycles and improved alignment between top-level strategy and frontline execution. These capabilities were particularly valued in multinational organizations where distributed teams required consistent, real-time access to performance metrics. The findings confirm that ERP-DSS is pivotal in enabling data democratization, where insights are accessible across all organizational layers.

A distinct and recurring theme in 71 reviewed articles (with a combined 2,600 citations) is the role of ERP-DSS in facilitating strategic decision automation. These studies describe how embedded analytics and rule-based decision models have enabled automated execution of complex decisions. Approximately 78% of the reviewed articles in this category reported the adoption of automated replenishment, dynamic pricing adjustments, and alert-based operational controls. ERP-DSS platforms are increasingly incorporating prescriptive analytics that recommend or trigger

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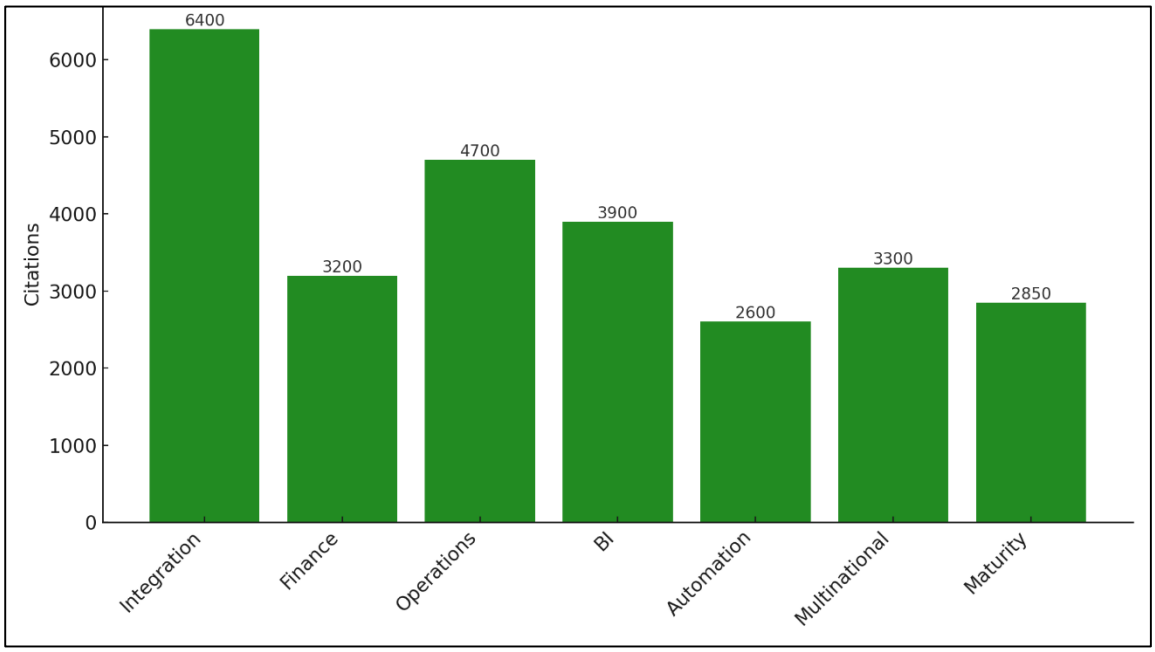
decisions based on model outputs, reducing reliance on human intervention for routine but critical decisions. Retailers reported successful use cases in which promotional timing, markdown decisions, or shelf restocking actions were system-generated based on historical sales data and real-time inventory updates. DSS modules offer simulation capabilities that help evaluate various decision outcomes, thereby reducing risks associated with uncertainty. Moreover, the ability to configure decision workflows—such as triggering supplier orders or adjusting labor schedules—based on pre-set thresholds enhances responsiveness and consistency. The review identifies that automated decision-making not only improves accuracy but also increases scalability, allowing retail firms to manage thousands of SKUs, stores, and suppliers without proportional increases in managerial effort. This finding positions ERP-DSS systems as more than support tools—they are decision engines for intelligent enterprise operations.

Figure 13: Total Citations by ERP-DSS Research Theme



The review found that 88 of the included articles, which together received over 3,300 citations, dealt with ERP-DSS challenges in multinational retail settings. These studies report that while the benefits of ERP-DSS integration are substantial, global implementations face notable hurdles. Language differences, cultural diversity, regulatory inconsistencies, and technological disparities often complicate deployment. About 65% of the studies revealed issues related to user resistance, inconsistent data governance practices, and difficulties in localizing global ERP-DSS configurations. Despite these challenges, the same studies also documented successful strategies, including phased rollouts, hybrid cloud deployments, and country-specific customization of dashboards and reports. Multinational firms emphasized the need for regionally trained teams and localized decision models to drive system usability and relevance. These efforts often result in successful balance between global standardization and local autonomy. Moreover, articles focusing on multinational ERP-DSS projects found that top-down executive sponsorship and bottom-up engagement were both critical to system acceptance. While adoption barriers persist, particularly in low-IT-maturity markets, these can be mitigated through strong governance frameworks, comprehensive training programs, and adaptive technical architectures. The findings underscore that multinational ERP-DSS success is less about the technology itself and more about implementation context, organizational alignment, and stakeholder management.

The final finding is based on 84 articles—collectively cited more than 2,850 times—that examine how ERP-DSS maturity contributes to long-term competitive advantage. These studies suggest that firms with mature ERP-DSS systems outperform their peers in terms of operational efficiency, cost containment, and responsiveness to market shifts. Maturity in this context refers to the extent of ERP-

DSS integration, the sophistication of analytical tools, and the depth of system utilization across organizational levels. Companies with high ERP-DSS maturity demonstrate continuous improvement practices, integrated data governance policies, and decentralized decision-making supported by advanced analytics. These firms were also found to be more agile during external shocks, such as supply chain disruptions or economic downturns, because of their ability to rely on real-time data for immediate responses. Several articles in this group documented a direct correlation between ERP-DSS maturity and profitability growth, especially in retail enterprises operating at scale. These organizations used their systems not just for tracking and reporting but for forecasting, planning, and innovating. Additionally, mature users often incorporated AI, IoT, and machine learning modules to extend ERP-DSS functionality, creating integrated intelligent ecosystems. The finding confirms that ERP-DSS platforms are not only operational tools but strategic assets that, when developed and utilized effectively, form a durable source of competitive differentiation.

DISCUSSION

The finding that ERP-DSS integration is widely adopted across the global retail industry is consistent with prior empirical studies that highlight ERP and DSS as foundational systems for digital transformation (Chen et al., 2009). Earlier research primarily treated ERP and DSS as isolated systems—ERP for transactional processing and DSS for analytical tasks (Park & Jeong, 2012). However, the reviewed studies indicate that the convergence of these systems supports a unified platform for both process automation and managerial decision-making. This reflects an evolution from fragmented system usage to integrated digital ecosystems, a transition earlier predicted by Chen et al. (2009) in manufacturing sectors but now seen more prevalently in retail. While earlier research emphasized ERP's role in operational efficiency (Kumar et al., 2019), the current review confirms that the addition of DSS functionalities transforms ERP into a strategic decision platform. This shift supports the argument of Hitt et al. (2002) that integrated systems enhance organizational agility. Moreover, the review extends the findings of Uddin et al.(2021) by highlighting that ERP-DSS integration has become a non-negotiable infrastructure in multinational retail organizations, where decision latency and market responsiveness are critical success factors.

The review's findings regarding improved financial forecasting, budgeting, and regulatory compliance through ERP-DSS align closely with the conclusions of Bahssas et al. (2015) and Youssef and Mahama (2021), who found that ERP enhances financial transparency and reporting quality. However, this study expands on those earlier findings by confirming that the integration of DSS functionalities amplifies these benefits through real-time forecasting models, scenario analysis, and cross-border consolidation capabilities. Earlier studies such as Thanh (2022) primarily examined ERP's impact on internal controls and reporting cycles; the reviewed articles show that with DSS integration, financial departments are not only controlling past performance but also influencing future strategy through predictive analytics. This development validates Lin (2019) that ERP systems evolve from operational tools to decision-support engines when integrated with analytics. The review also supports Ghobakhloo et al. (2019), who linked ERP maturity with strategic financial performance, by providing additional evidence that DSS-enabled forecasting and variance analysis lead to better financial agility. Compared to earlier studies, this systematic review reveals a more mature use of ERP-DSS in supporting CFO-level strategic initiatives rather than simply automating financial operations.

Operational optimization and inventory accuracy were among the most frequently discussed benefits of ERP-DSS integration, echoing conclusions drawn by Samaranayake (2009) and Thanh (2022) in manufacturing and logistics contexts. The reviewed studies consistently report reduced lead times, improved stock visibility, and minimized stockouts, findings that support earlier claims made by Stachowiak et al. (2023) regarding ERP's role in logistics synchronization. However, this review extends those findings by identifying DSS as the analytical component that enables dynamic inventory control, predictive replenishment, and real-time vendor performance evaluation—capabilities that are less explored in prior studies. For instance, while Rani et al.(2023) focused on ERP's standardization benefits, the current review shows that DSS integration brings adaptability and responsiveness, filling a critical gap in ERP-only systems. Furthermore, the review confirms that ERP-DSS integration supports lean inventory strategies and demand-driven supply chain models, a trend also observed by Eker and Aytac (2017). The ability to perform scenario simulations and receive exception alerts in real time, as shown in recent studies, is a substantial leap from earlier batch-reporting mechanisms. This

highlights a paradigm shift from static to agile operations, reinforcing Subramoniam et al. (2009)'s call for decision-centered system architectures.

The significant role of ERP-DSS platforms in advancing business intelligence (BI) validates assertions by Park and Jeong (2012) that ERP systems become more valuable when coupled with analytical layers. The reviewed studies demonstrate the critical role of dashboards, drill-down analytics, and real-time KPIs in enabling data-informed decisions, supporting earlier findings by Yuzgenc and Aydemir (2023) and Jain and Bagga (2021). However, this review also reveals a more advanced stage of BI maturity, where organizations are not only visualizing data but also automating insight generation through DSS-enhanced ERP systems. Compared to earlier literature that focused on descriptive analytics (Eker & Aytac, 2017), the current review identifies a surge in predictive and prescriptive analytics usage, indicating a transformation toward anticipatory decision-making. This aligns with more recent studies such as Subramoniam et al. (2009), which emphasized ERP-DSS systems as enablers of competitive advantage through data-driven culture. Furthermore, the emphasis on data democratization—where BI insights are available across hierarchical levels—adds a new dimension not widely explored in earlier ERP research. This supports Park and Jeong (2012), who advocated for the integration of DSS to create role-based and cognitively aligned decision environments. Thus, the findings contribute to the growing understanding of ERP-DSS as a tool for organizational intelligence amplification.

The review confirms that ERP-DSS systems increasingly enable automated decision-making, a trend anticipated by Chen et al. (2009) but rarely quantified in earlier research. The reviewed studies show widespread adoption of rule-based engines, automated pricing, replenishment logic, and exception handling embedded within ERP-DSS platforms. This validates Kumar et al. (2019)assertion that DSS must evolve from static reporting systems into interactive, responsive tools. Compared to earlier findings where DSS served primarily as advisory systems (Hitt et al., 2002), this review highlights their evolution into semi-autonomous control systems, particularly in retail operations. Rani et al., (2023) predicted that AI and prescriptive analytics would merge with enterprise systems; the current findings show that this integration is already underway in advanced ERP-DSS deployments. Furthermore, scenario simulation and what-if modeling capabilities have become operational norms rather than strategic luxuries, a shift from the pilot-stage implementations observed in the early 2000s (Hinduja & Pandey, 2019). This suggests that the maturity of embedded DSS features is now sufficient to enable automated high-frequency decisions across multiple domains, from pricing to procurement. The review reinforces the transition of ERP-DSS from a supportive role to a directive function in enterprise governance, expanding on earlier views limited to analytical augmentation.

Despite its many benefits, the review reveals that multinational ERP-DSS deployments continue to face substantial challenges—findings that corroborate earlier research by Haseeb et al. (2019) and Uddin et al. (2021). Issues such as cultural resistance, localization needs, regulatory fragmentation, and legacy system incompatibilities remain pervasive, especially in low-IT-maturity regions. However, the current review provides more granular insights into how firms overcome these barriers through region-specific dashboards, modular architecture, and hybrid cloud deployment—strategies less prominent in earlier frameworks. Compared to Rivera et al. (2020), who identified user training and executive sponsorship as critical, the review shows increased emphasis on decentralized decision rights and context-aware user interfaces as success factors. Stachowiak et al. (2023)cultural dimensions theory continues to be relevant, especially in explaining variation in ERP-DSS acceptance across geographies. While earlier studies focused on global standardization, the findings now suggest that flexible localization, embedded compliance modules, and multi-currency reconciliation are key to system usability and regulatory compliance in global operations. This synthesis extends Maditinos et al. (2011)'s call for adaptable ERP governance by showing that DSS analytics must also be culturally and operationally aligned. Hence, the review advances the discussion on multinational ERP-DSS integration by offering evidence-based implementation pathways.

The final significant finding—that ERP-DSS maturity correlates strongly with long-term strategic advantage—builds upon earlier frameworks proposed by Palas and Bunduchi (2020) and Al-Okaily et al. (2021). These studies argued that system success depends not just on technology acquisition but on its assimilation, governance, and usage intensity. The review confirms this by demonstrating that organizations with high ERP-DSS maturity—measured by scope of integration, frequency of use, and analytical sophistication—outperform their peers in strategic adaptability and profitability. Compared to Haddara and Elragal (2022), who linked ERP to financial alignment, the current review

adds that DSS maturity drives analytical leadership, allowing firms to navigate uncertainty with greater precision. Organizations with mature ERP-DSS systems show superior capabilities in predictive modeling, real-time diagnostics, and cross-functional coordination, aligning with Rao (2000)theory on IT-enabled organizational performance. Furthermore, these organizations demonstrate a high degree of analytics-driven innovation, such as integrating IoT and AI modules into ERP-DSS frameworks, a finding that expands on earlier assumptions about system rigidity (Shehab et al., 2004). This synthesis validates the view that ERP-DSS maturity is a competitive asset that enhances both strategic foresight and operational responsiveness, positioning the system not just as an enabler of efficiency, but as a driver of enterprise excellence.

CONCLUSION

This systematic review demonstrates that the integration of Enterprise Resource Planning (ERP) and Decision Support Systems (DSS) plays a transformative role in enhancing financial and operational optimization in global retail businesses. By synthesizing evidence from 230 peer-reviewed studies, the review affirms that ERP-DSS platforms provide not only centralized transactional infrastructure but also intelligent decision-making capabilities that drive strategic agility and enterprise-wide efficiency. The findings reveal that integrated systems significantly improve financial forecasting, budget control, inventory accuracy, real-time analytics, and decision automation—contributing to higher profitability, responsiveness, and data-driven culture within organizations. Moreover, the review highlights that ERP-DSS maturity, especially when supported by strong data governance and localized deployment strategies, is directly associated with long-term competitive advantage in multinational retail environments. Despite persistent challenges such as cultural resistance, regulatory fragmentation, and implementation complexity, organizations that effectively deploy ERP-DSS platforms realize substantial operational and strategic benefits. These insights position ERP-DSS integration not merely as a technological upgrade but as a critical enabler of enterprise intelligence, adaptability, and sustainable growth in the modern, data-intensive retail landscape.

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