

ERP-Mediated Information Integration: An Empirical Case Study on Supply Chain Efficiency in Morocco's Red Meat Sector

Intégration Informationnelle Médiatisée par ERP : Une Étude de Cas sur l'Efficacité Logistique dans le Secteur de la Viande Rouge au Maroc

BENTALEB Fatima Zahra

PhD Researcher

Faculty of Legal, Economic and Social Sciences

Mohammed V University, Agdal

Laboratory for the Study and Research in Management Sciences

Morocco

fatimazahra-bentaleb@um5r.ac.ma

TAKI Mounaim

PhD

Faculty of Legal, Economic and Social Sciences

Mohammed V University, Agdal

Laboratory for the Study and Research in Management Sciences

Morocco

mounaim.t.2010@gmail.com

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Abstract

In the framework of the Generation Green Strategy (2020-2030) and the preceding Green Morocco Plan (2008-2020), the red meat industry is recognized as a substantial catalyst for food security, employment, and the promotion of modernization through the adoption of technological advancements. The primary aim of this research paper is to examine the extent to which information integration, facilitated through ERP implementation, affects the supply chain performance of agri-food companies. To this end, the article examines a case study of an agri-food holding that successfully implemented a customized ERP system in 2016. Employing a qualitative research strategy, twelve semi-structured interviews were conducted across the six enterprises within the holding until theoretical saturation was reached. The investigation's findings demonstrate the substantial impact of ERP-mediated information integration on supply chain performance, leading to improvements in decision-making processes and operational efficiency. This study serves as a basis for further academic investigations and policy discussions in the pursuit of an effective, sustainable, and technologically advanced agri-food supply chain. Furthermore, it suggests the need for additional research in order to get a thorough comprehension of the complex effects of ERP systems on the dynamics of agri-food supply chains.

Keywords : ERP system, Supply chain performance, Information integration, Agri-food sector, Red meat industry.

Résumé

L'industrie de la viande rouge est reconnue comme un catalyseur important pour la sécurité alimentaire, l'emploi et la modernisation à travers l'adoption des avancées technologiques dans le cadre de la Stratégie Génération Verte (2020-2030) et Plan Maroc Vert précédemment en vigueur (2008-2020). La présente étude vise à déterminer dans quelle mesure l'intégration des informations, découlant de l'implémentation du progiciel de gestion intégré, affecte la performance logistique des entreprises agroalimentaires. Dans cette perspective, nous examinons le cas d'une holding agroalimentaire qui a adopté avec succès un PGI personnalisé en 2016. Adoptant une démarche qualitative, douze entretiens semi-directifs ont été réalisés au travers des six sociétés constituant cette holding, et ce, jusqu'à l'obtention d'une saturation théorique. Les résultats de l'enquête montrent que l'intégration des informations via le système ERP a un impact significatif sur les performances de la chaîne logistique, ce qui améliore les processus décisionnels et l'efficacité opérationnelle. Cette étude sert de base à d'autres recherches universitaires et discussions politiques sur la poursuite d'une chaîne logistique agroalimentaire efficace, durable et technologiquement avancée. Elle suggère également que des recherches supplémentaires sont nécessaires pour mieux comprendre l'impact complexe des systèmes ERP sur la dynamique des chaînes logistiques agroalimentaires.

Mots clés : Progiciel de Gestion Intégré, Performance de la chaîne logistique, Intégration informationnelle, Secteur agroalimentaire, Industrie de la viande rouge.

Introduction

Providing about 98% of Morocco's food security and creating 44 million working days throughout its value chain, the red meat industry plays a major role in the Kingdom's economy (Ministry of Agriculture, 2021). The Green Morocco Plan (2008–2020) led to a 17% increase in the number of cattle between 2003–2007 and 2015–2018, accelerating this progress. The transition to the Generation Green Strategy (2020–2030), which aims to sustain GMP's achievements while placing a strong emphasis on human development and downstream agri-chain valorization. In line with Generation Green's objectives, the program contract between the Ministry of Agriculture and the Interprofessional Red Meat Federation seeks to significantly increase the production and modernization of red meat by 2030 through technological innovation and strengthened research-development linkages (Ministry of Agriculture, 2023). Given the meat sector's importance and the challenges arising from its technological transition, our study focuses on the role of information technologies, particularly enterprise resource planning systems, in the informational integration and its impact on agri-food companies' supply chain performance. ERP improves information flow and process organization by combining data from various systems into a single platform, which simplifies organizational operations and allows for real-time access to current information throughout the organization (Banerjee, 2018; Rajapakse, 2023; Savoy & Salvendy, 2016; Shee et al., 2018). For this, we aim to address the following research question: To what extent does information integration, mediated by ERP implementation, impact agri-food companies' supply chain performance? Our research paper starts with a literature review of ERP role in supply chain management. Subsequently, the research model is conceptualized and the research questions are formulated. Thereafter, research methodology is presented and empirical findings are discussed. Lastly, the paper explores the research implications and limitations within the conclusion.

1. Role of ERP in Supply Chain Management

Supply chain management is a strategic methodology that seeks to effectively integrate stakeholders within the supply chain by employing financial and informational frameworks. The primary objective of SCM is to ensure the timely production and distribution of merchandise in appropriate quantities to the designated locations, with the ultimate goal of minimizing costs and meeting service level requirements (Bentaleb & Taki, 2022; Huda et al., 2019; Kürşat & Türker, 2020). The coordination process in the supply chain progresses through three distinct stages. Initially, there is a sharing of information among the various actors

involved, followed by an increased level of cooperation where both information and material flows are coordinated. Finally, the highest level of coordination is achieved, wherein there is shared control over information, material, and financial flows among all actors in the supply chain (Bentaleb & Taki, 2022; Mangaladurai & Nemati, 2013). The relevance of ERP systems becomes evident in their ability to centralize data inside a unified database, thereby enhancing inter-departmental communication and operational integration (Goldston, 2020). Furthermore, these systems play a crucial role in enhancing both internal and external communication by integrating many functional systems into a cohesive platform, resulting in a more efficient flow of information across different departments (Baran & Galka, 2016; Rajapakse, 2023). The process of consolidation facilitates convenient retrieval of up-to-date operational data, hence optimizing the efficiency of decision-making procedures (Rajapakse, 2023; Shee et al., 2018). From an external perspective, ERP offers a consolidated platform for organizing client data, which assists in the effective management of uncertainties and the optimization of costs within the supply chain. Additionally, it functions as a proficient inventory tracking system, hence facilitating enhanced inventory management and timely procurement of raw materials (Alansari & Mishra, 2019). In addition, it aids in the assessment of supplier performance, hence streamlining procurement procedures (Huang & Handfield, 2015) and ensuring the integrity of data, which is essential for boosting the efficiency of the supply chain (Ruivo et al., 2020).

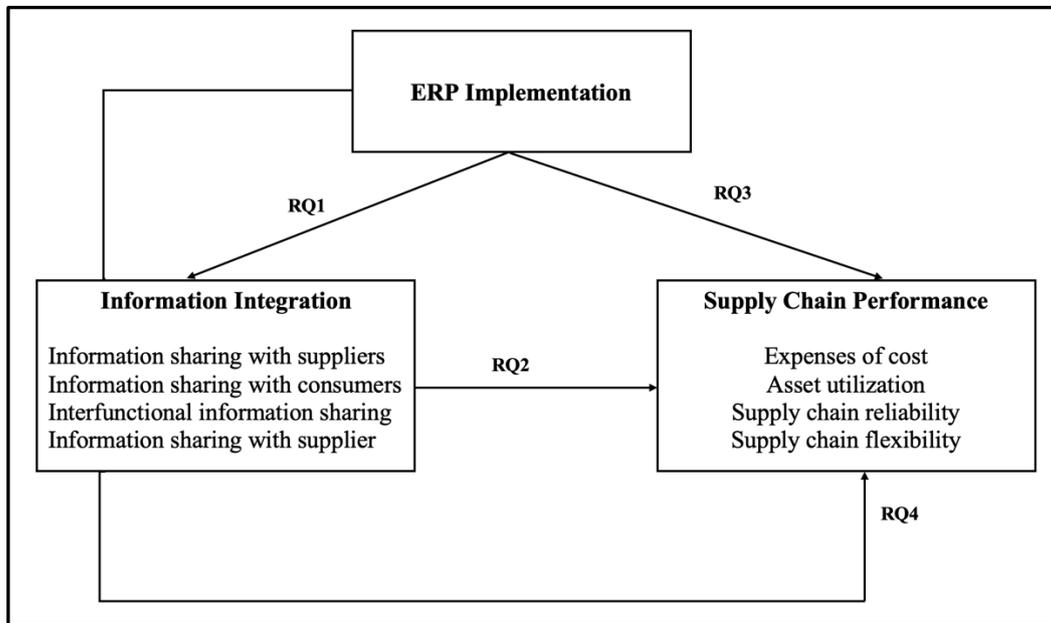
2. Research Model & Questions

Previous research has widely recognized the significant impact of ERP systems on enhancing efficiency in supply chain management through the integration of information (Thong and Yap, 1995; Chen et al., 2011; Kim and Lee, 2010). ERP systems play a crucial role in standardizing information across various departments within businesses. This standardization facilitates the integration of diverse systems, resulting in a unified structure. Consequently, the implementation of ERP systems reduces information gaps and enhances communication inside organizations (Bheshti et al., 2014; Oghazi, 2009). The use of ERP systems enables businesses to shift from a hierarchical decision-making strategy to a more decentralized and inclusive one. This transformation, as highlighted by Abubakar et al. (2019), Suprpto et al. (2017), Bento et al. (2020), and Pohludka et al. (2018), helps to break down departmental barriers and develop a cohesive data infrastructure throughout the whole company. ERP systems play a crucial role in consolidating data and facilitating the exchange of information between different departments. This data integration promotes more efficient decision-making processes, reduces

gaps in information for effective communication within and outside the organization, and enables real-time data sharing for timely decision-making and operational planning. Consequently, ERP systems have a positive impact on supply chain performance, as supported by various studies (Fiaz et al., 2018; Beheshti et al., 2014; Oghazi, 2009; Simchi-Levi et al., 2003; Laulita et al., 2022). The integration of suppliers is enhanced by ERP systems, which establish a robust informational framework that is crucial for achieving operational efficiency and ensuring customer satisfaction (Levi et al., 2003; Oghazi, 2009). When integrated with customer relationship management modules, ERP systems enhance customer relationships by facilitating a dynamic and interactive communication channel. This enables organizations to tailor their operations to meet customer requirements and gather valuable data. Consequently, firms are able to align themselves more effectively with customer expectations, resulting in improved supply chain performance (Simchi-Levi et al., 2003; Oghazi, 2009). ERP systems have the ability to eliminate obstacles to effective communication, promote greater transparency, and establish a centralized repository of information. These features have a profound impact on the dissemination of information within organizations, resulting in enhanced organizational performance and stronger relationships with external stakeholders (Abd Elmonem et al., 2016; Rajan & Baral, 2015). Based on the aforementioned factors, it becomes evident that the implementation of ERP instigates technological and organizational change within companies. This change fosters a collaborative and data-centric environment that is crucial for improving real-time decision-making and coordination in the intricate supply chain ecosystems of agri-food companies (Abd Elmonem et al., 2016; Fiaz et al., 2018; Suprpto et al., 2017). The study conducted by Koçoğlu et al. (2011) suggests that effective information sharing allows companies to gain valuable insights on how to leverage information sharing to improve their performance. Pandiya et al. (2020) examine the influence of information technology and information sharing on manufacturing supply chains. The results indicate that these elements have a favorable effect on supply chain integration and overall performance, particularly when businesses utilize information technology and engage in information sharing with their supply chain partners (Pandiya et al., 2020). Our study aims to investigate the impact of ERP systems on information integration and supply chain performance in the agri-food industry, building upon existing literature that has identified a significant correlation between these variables. Based on the foregoing rationale, and taking into account the validation of information sharing and supply chain performance measurements as

demonstrated by Koçoğlu et al. (2011) and Pandiya et al. (2020), we have conceptualized our research model, as shown in Figure 1 :

Figure 1 : Conceptual Framework



Source : Modified from Koçoğlu et al. (2011) and Pandiya et al. (2020)

The model proposes the following research questions to explore these specific relationships:

- **RQ₁:** What is the effect of ERP implementation on information integration within agri-food companies?
- **RQ₂:** How does enhanced information integration influence supply chain performance within agri-food companies?
- **RQ₃:** To what extent does ERP implementation directly affect the supply chain performance of agri-food companies?
- **RQ₄:** Does information integration serve as a conduit through which ERP implementation affects supply chain performance in the agri-food sector?

The relationships described above are explored qualitatively, aiming to comprehensively uncover the intricacies of how ERP system might impact information integration and overall performance in the agri-food supply chain.

3. Research Methodology

Qualitative research is a methodological approach that aims to understand the nature and quality of phenomena, examining their diverse manifestations and contextual factors. This type of research focuses on exploring people's direct experiences and seeks to uncover the underlying

reasons or motivations behind these experiences, rather than simply describing the observable facts. It employs various inquiry systems, such as case studies, ethnography, and discourse analysis, to gather and analyze data. In contrast, quantitative research primarily deals with numerical data and employs statistical analysis to derive insights (Bhandari, 2022; Elhami & Khoshnevisan, 2022; Fossey et al., 2002, Philipsen & Vernooij-Dassen, 2007; Punch, 2013 ; Ugwu & Eze, 2023). The utilization of interviews is a common practice in qualitative research as a means to obtain a deeper understanding of participants' perspectives (Barrett & Twycross, 2018; De Fina, 2019; Elhami & Khoshnevisan, 2022). Semi-structured interviews are frequently employed as a prevalent kind of interview methodology since they offer a combination of planned inquiries and opportunities for open-ended dialogue (Elhami & Khoshnevisan, 2022; Neergaard & Leitch, 2015; Nicholls, 2009). In comparison, structured interviews are characterized by a more inflexible approach, employing predetermined questions, while unstructured interviews are characterized by a more casual and adaptable nature, but they may deviate from the primary study objectives (Elhami & Khoshnevisan, 2022; Gillham, 2005; Neergaard & Leitch, 2015). The appropriate selection of interview methods plays a pivotal role in the efficient acquisition of essential data for qualitative research (Elhami & Khoshnevisan, 2022; Mason, 2002). Given our emphasis on the integration of information and the inherent intricacy of the agri-food supply chain, we have elected to employ a streamlined research strategy. The chosen research approach involved the utilization of one-hour semi-structured interviews to comprehensively comprehend and assess the influence of ERP system on supply chain performance within a Moroccan agri-food holding. The selection of this interview method was based on its flexibility and capacity to provide in-depth insights, enabling a systematic yet open-ended investigation of the relevant subject matter (Elhami & Khoshnevisan, 2022; Neergaard & Leitch, 2015; Nicholls, 2009). The company focused on various aspects of the agri-food industry, including cattle fattening, distribution, and meat processing. During the period from 2014 to 2016, the company employed separate information systems, resulting in a lack of integrated management software for efficient communication and coordination between departments and subsidiary companies. In 2016, the company diversified its operations to include more lucrative activities such as slaughtering and composting. Additionally, it effectively adopted a customized ERP system to accommodate its unique logistical requirements. This implementation was made possible through the guidance of the director and the competence of the well-trained workforce. Consequently, the integration of data from different subsystems was enhanced, leading to improved real-time tracking of

information. As a result, the holding achieved enhanced traceability, transparency, and data integrity. The point of theoretical saturation was reached after conducting 12 interviews with key personnel across the six companies within the holding. The interviewees included the general director of the holding, IT manager, supply chain manager, fattening & animal nutrition company manager, slaughtering company manager, offal & cutting company manager, distribution company manager, composting company manager, transformation company manager, finance and accounts manager, HR manager and quality assurance manager. The analysis of collected data in this study is conducted using thematic analysis, a method that aims to identify and establish connections between themes in order to derive comprehensive meanings from the data (Nowell et al., 2017; Braun & Clarke, 2006; Kampira, 2021). This approach is particularly valuable due to the exploratory nature of the research and the limited size of the sample. The analysis uncovers five main themes, which will be further examined in the next section.

4. Thematic Analysis Results

4.1. Analysis of Agri-food Holding's supply chain

The objective of this analysis is to get a comprehensive understanding of the many components and processes encompassed in Agri-food Holding's supply chain.

Theme 1. Upstream Supply Chain Activity

The initial phase of the supply chain process includes the procurement of cattle and sheep, which undergo a designated time of quarantine prior to being allocated to specific feedlots for the purpose of fattening. Upon the animals' arrival, their weights are measured and recorded. This data is then entered into a customized tracking system that generates daily estimations of weight increase, which are verified by monthly weigh-ins. The system records comprehensive data for each individual bovine, encompassing its identification, provenance, breed, gender, mass, immunization particulars, and allocation within the feedlot, until the animals attain the targeted weight for commercial transactions. Cattle of all origins are electronically recognized by an authorized authority, thus guaranteeing traceability across the whole supply chain, from the farm to the consumer. Suppliers can be provided with information pertaining to the origin and purchase specifics of cattle, whilst growth data can be disseminated to customers, hence fostering openness within the supply chain.

Theme 2: Slaughtering Phase

The slaughtering phase is a highly organized and strictly supervised component of the meat processing cycle, starting with the animals' offloading. In order to maintain traceability throughout the slaughtering process, each animal is methodically identified. After being verified, animals are sent to the spot designated for slaughtering, where they undergo a process that adheres to humane standards. Following this, a systematic approach is employed to execute the processes of dermabrasion, decapitation, and disembowelment, ensuring strict adherence to rigorous health and quality protocols. In this step, veterinary checks are carried out in order to ascertain the absence of illnesses and pollutants in the meat. Subsequently, the carcasses are divided according to specific criteria, meticulously weighed to ensure precise documentation and appropriate pricing, and ultimately transferred to refrigerated storage facilities in order to maintain their optimal freshness and quality. Every stage of the process, starting from the unloading phase to the cold storage phase, is carefully documented and closely monitored in order to guarantee compliance with established norms and uphold the exceptional quality and safety standards associated with premium meat products.

Theme 3: Distribution Phase

The logistics manager uses the functionalities of the ERP system to assign delivery assignments to staff members. The information system serves as a central database containing essential information and enables efficient communication between the logistics manager and the delivery infrastructure. Every driver is provided with a comprehensive delivery schedule that includes full information on the items and clients. In addition, ERP system is seamlessly incorporated with various vehicle systems, including Global Positioning System, refrigerator temperature monitoring, and vehicle status reporting. These integrations play a crucial role in facilitating the timely and accurate monitoring of deliveries in real-time; guaranteeing that items are transported in ideal conditions and delivered to clients within the designated timeframes, therefore upholding the holding's commitment to punctuality and product excellence.

Theme 4: Composting Activity

The composting operation involves the conversion of organic waste into compost, representing an environmentally conscious activity that contributes to the practice of sustainable resource management. This phase is now conducted externally to the ERP system.

Theme 5 : Meat Transformation

In the transformational phase, raw beef products undergo additional processing to assume a diverse range of shapes, influenced by either client preferences or market demand. This critical stage encompasses a variety of processes such as grinding, seasoning, and packing, among

others, to produce a diverse range of meat products. At the core of this undertaking lies a steadfast commitment to rigorous hygiene practices, stringent quality control methods, and meticulous operating processes. In pursuit of its commitment to innovation, the holding is currently conducting trials on a mobile integrated system with the objective of reinventing the meat transformation process. The proposed system aims to offer a platform for clients, including municipal authorities, restaurants, hotels, and other relevant entities, to make orders directly by inputting data into the database. This would result in improved efficiency and real-time monitoring of the transformation process. The current process of transformation is taking place in specific processing zones. However, the primary objective is to differentiate this activity and establish independent outlets in various regions. This will bring the transformation process closer to the customers and enhance the company's presence in the meat processing industry.

4.2. Analysis of ERP's impact on Supply Chain Performance via Information Integration

This analysis aims to assess the effects of ERP system on each component of the supply chain within the agri-food holding.

Theme 1: ERP & Fattening

Through the careful and systematic documentation and organization of many aspects pertaining to each animal, such as their identification number, origin, breed, weight, and immunization history, a comprehensive and resilient database is established. The database in question serves as more than a mere static repository; rather, it functions as a dynamic tool that facilitates essential tasks, including the estimation of daily feed consumption per animal, encompassing both cost and quantity considerations. The ability to effectively manage resources with precision is crucial in industries where profit margins are often narrow, since it enables efficient cost control. The capabilities of the ERP system extend beyond the basic function of data recording, encompassing the facilitation of inter-functional information interchange. The effective exchange of data throughout various departments, including as procurement, health management, and sales, is essential for optimizing operational efficiency. This facilitates the smooth coordination of activities, ensuring that each unit is equipped with the necessary information to work in harmony. Furthermore, it should be noted that the interdepartmental exchange of data is not a unidirectional process, but rather establishes a feedback loop that enhances the efficiency of overall operational processes. The input provided by the sales

department on market demand has the potential to affect procurement decisions. Consequently, this can impact health management plans, since it ensures that the supply chain remains sensitive and adaptive to dynamic conditions. The value of ERP also extends to facilitating real-time data sharing with suppliers on cattle origin, weight, and health status. The establishment of openness not only fosters confidence but also facilitates improved strategizing and collaboration with other parties. In addition, the metrics offered by the ERP system, such as monitoring asset usage and optimizing feed consumption, play a crucial role in minimizing operating costs and thereby improving the performance of the supply chain. The ERP system also offers a means to improve asset use. By effectively managing the available feedlots and guaranteeing their optimal usage, it mitigates resource inefficiency and guarantees that the activities are operating at maximum capacity. Furthermore, the comprehensive data management facilitated by the ERP system serves as the foundation for enhancing the adaptability of the supply chain. The alert stresses the need of immediately and effectively responding to operational challenges by leveraging real-time data on the weight and health of cattle. This attribute has great importance in a field where timeliness plays a critical role in upholding quality standards and fulfilling market requirements. The ERP system enables a systematic flexibility that goes beyond immediate responses to current circumstances. It also strategically positions the operation to effectively navigate future uncertainties. Consequently, the ERP system plays a crucial role in improving the holding's upstream supply chain performance.

Theme 2 : ERP & Slaughtering

ERP system provides real-time transmission of comprehensive information pertaining to slaughter schedules, quality control outcomes, and product accessibility between suppliers and buyers. The proper functioning of the ERP system relies heavily on inter-functional information sharing, entailing real-time transmission of data across several components, including slaughter processes, veterinary inspections, and inventory management. This particular functionality plays a key role in sustaining uninterrupted communication inside the information system, which guarantees that all components involved in the process of slaughter are effectively coordinated and equipped with the requisite information to facilitate seamless operations. Additionally, ERP system plays a pivotal role in the monitoring and documentation of every stage involved in the slaughtering process, ensuring precise data collection and immediate monitoring, which is essential for improving operational effectiveness and adhering to legal responsibilities. The ERP system provides the essential tools for verifying

the fulfillment of tasks, generating electronic documentation for individual animal components, and overseeing the entire process, hence assuring traceability and compliance with industry standards and regulatory requirements. Furthermore, the metrics supplied by the ERP system have a substantial impact on reducing operating expenses, efficiently controlling asset use, and improving the dependability and flexibility of the supply chain. The ERP system possesses several functions that make it an essential instrument for enhancing productivity, ensuring compliance with laws, and facilitating the production of high-quality meat products throughout the slaughter phase of the operation.

Theme 3: ERP & Offal/Cutting Activity

The ERP system enables the timely exchange of information between suppliers and customers on inventory levels and product availability. This functionality has significant importance in demand planning and enhancing customer satisfaction. The system enhances inter-functional information sharing by streamlining operations across the cutting, packing, and inventory management departments, hence ensuring a seamless and uninterrupted flow of information and activities between these phases. Making use of this integrated method facilitates operational efficiency, reduces costs, and optimizes resource utilization. The metrics of the ERP system offer valuable data that assists in the efficient management of inventory levels, ultimately guaranteeing the dependability and adaptability of the holding's supply chain. Further, the ERP system plays a key part in ensuring the precision of data entry, labeling, and monitoring for each product across all stages of production, including cutting, packaging, and storage. Such features are of utmost importance in maintaining quality control and traceability. The comprehensive monitoring and control of resources via the ERP system effectively addresses any inconsistencies that may occur during order processing. As a result, it ensures the precise packing and timely delivery of commodities, aligning with consumer demand. These added benefits not only enhance consumer satisfaction, but also significantly contribute to the dependability of the supply chain and the overall operational effectiveness. management.

Theme 4: Distribution

During the distribution phase, the ERP system becomes a centralized hub, which serves the purpose of consolidating all essential data related to distribution. This includes many aspects such as driver assignments, route planning, real-time tracking, and delivery confirmation. The process of centralization is not only a matter of convenience, but rather a fundamental requirement for effectively coordinating a complex system of real-time modifications as needed. Consequently, this leads to an improvement in the effectiveness of the distribution

process. The process of exchanging information takes on a reciprocal nature, wherein timely updates on delivery statuses and product tracking details are exchanged with consumers, hence promoting transparency and cultivating confidence. On the other hand, the exchange of status updates and inventory levels with suppliers can establish a reciprocal flow of information, therefore enhancing the reliability and flexibility of the supply chain. The ERP system is characterized by the presence of interdepartmental synergy among sales, logistics, and customer support, which serves as a distinguishing feature. This collaborative effort guarantees that all stakeholders are in agreement on the specified timeframes for delivery, leading to cost reduction, higher reliability of the supply chain through real-time monitoring, and more flexibility stemming from improved collaboration the supply chain stakeholders. ERP plays an essential role in consolidating delivery information, facilitating real-time tracking, and effectively managing the process of distributing goods in a timely manner. The inclusion of vehicle condition monitoring and delivery status tracking in the ERP efficiently improves asset utilization and decreases operational expenditures. This emphasizes the fundamental importance of ERP system in facilitating the smooth functioning of the distribution process, enabling it to effectively respond to the evolving requirements of the supply chain dynamics.

Theme 5 : ERP & Meat Transformation

ERP system enables the dissemination of information across different organizational functions, ensuring that pertinent departments are instantly notified of the advancements in the transformation process. This methodology facilitates the optimization of operational processes and the promptness of decision-making, both of which are crucial for fulfilling consumer demands and meeting the expectations of many stakeholders. As previously stated, the holding is carrying out trials on a mobile integrated system that aims to provide a platform for clients, such as municipal authorities, restaurants, hotels, etc., to directly submit orders by inputting data into the database. The adoption of the mobile application is expected to greatly improve the efficiency of the meat processing process. Hence, it is expected that integrating of these features will result in improved operational efficiency, reduced expenses, and enhanced reliability and adaptability across the entirety of the supply chain. ERP system provides the holding with a systematic framework to evaluate its performance based on pre-established criteria by optimizing its operational processes. In turn, this enables the identification of specific areas that require modification or adaptation to improve operational effectiveness. Using ERP system within the meat transformation process of the holding company is a strategic initiative aimed at attaining operational excellence, ensuring compliance with regulatory

standards, promoting transparency, and improving decision-making capabilities. This undertaking is in line with the general goal of increasing meat processing operations and emphasizes the potential advantages of incorporating technology to enhance and modernize methods within the red meat industry in Morocco.

Conclusion

The empirical evidence presented in the study indicates that the implementation of ERP systems has a significant influence on the degree of information integration within agri-food firms. Moreover, the enhanced information integration has been found to have a substantial impact on the enhancement of supply chain performance. This is accomplished through optimizing cost expenditures and asset usage, while also improving supply chain reliability and flexibility. In addition, the significant relationship between the successful adoption of ERP system and the enhancement of supply chain performance was demonstrated through the influence of information integration. The research findings collectively address and provide valuable insights pertaining to the research questions (RQ₁→RQ₄) and support the premise that ERP adoption has a substantial impact on information integration. This aligns with the central research question and provides evidence that ERP-mediated information integration plays a crucial role in enhancing supply chain performance in the agri-food sector. Consequently, this integration enhances transparency, asset utilization, and flexibility within the supply chain, resulting in an overall improvement in the performance of meat processing and distribution operations. The holding company's prominent position in the industry is a result of its unimpeded integration, rigorous planning, and a combination of historic techniques and current technology. The holding is committed to upholding health, safety, and quality standards. This progress is further demonstrated by inventive initiatives such as mobile integrated systems for meat processing and sustainable waste management strategies, showcasing a dedicated effort to not only fulfill current market requirements but also advance towards future sustainability in the agricultural and food industry. Despite the current operation of the composting activity being conducted externally to the ERP system, there is potential for its integration to reveal new opportunities for enhancing traceability and efficiency. This integration could potentially optimize the profitability of composting and expand the scope of the ERP in promoting operational sustainability and efficiency. It is essential to acknowledge that this particular field of study has been subject to restricted academic research. The results derived from the theme analysis demonstrate that the incorporation of information via ERP systems

leads to a significant influence on the performance of supply chains. Yet, it is important to recognize that this particular study solely concentrated on three distinct variables. This implies that a more complete investigation is required in order to have a comprehensive understanding of the magnitude of ERP's impact on supply chain performance. The primary aim of this research is to fill a gap in the existing literature by presenting empirical findings that substantiate the widely acknowledged correlation, predominantly observed in industrial sectors, between ERP systems and the supply chain performance, mediated by information integration. Hence, this research contributes to a deeper understanding of the correlation between ERP systems and the efficacy of supply chain activities within the agri-food sector. In addition, it underlines the value of carrying out further extensive and varied queries to unveil the complexities of this association in forthcoming scientific research.

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