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STOCKOUTS AS SYSTEMIC INDICATORS: OMNICHANNEL CONSISTENCY AND INVENTORY MANAGEMENT IN PARAGUAYAN RETAIL

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ABSTRACT

Paraguayan retail is undergoing a change that goes beyond the adoption of digital channels: it extends to how companies coordinate work, share information, and make decisions. Tensions emerge when the commercial promise exceeds what operations can deliver, and they intensify when processes, systems, and decisions remain fragmented. Among the symptoms of this misalignment, stockouts stand out because they affect operational performance and erode customer trust. The conventional interpretation treats them as inventory-control failures. This study proposes an organizational and systemic perspective. Its purpose is to examine how omnichannel consistency, inventory management, and stockouts are related in Paraguayan retail, with attention to the organizational conditions that facilitate or hinder consistent execution. The study adopts a qualitative, documentary-analytical approach, complemented by professional experience in the sector. The analysis suggests that stockouts function as systemic indicators arising from three conditions: fragmented processes, inconsistent information, and decisions based on divergent objectives. Thus, omnichannel

consistency does not depend exclusively on technological investment and can be understood as an emergent property of organizational coherence. The study contributes a framework that reframes stockouts as structural signals.

Keywords: Omnichannel retail. Inventory management. Stockouts. Organizational alignment. Paraguay.

INTRODUCTION

The retail sector has changed substantially over the past ten years. Digital channels have expanded, e-commerce has moved from a niche to the mainstream, and customers now move across platforms within a single purchase decision (Brynjolfsson et al., 2013; Verhoef et al., 2015). The pace of this change varies by market, but its direction is consistent.

Customer expectations have followed. Today, customers expect to find the same product, at the same price, with the same delivery promise, wherever they search. Omnichannel strategies, once a differentiator, are now a competitive baseline. Implementing them, however, is a different challenge from describing them.

Effective omnichannel retail depends on the integration of processes, systems, and organizational structures to deliver a frictionless customer experience (Berman & Thelen, 2018; Hübner et al., 2016). Many organizations struggle at this point, and the gap widens in emerging markets, where digital tools often arrive faster than the organizational capabilities needed to use them effectively.

Paraguay is also experiencing the progressive adoption of digital channels in the retail sector. However, this evolution creates challenges related to the coordination of internal processes. The result is hybrid: digital interfaces layered over operating routines designed for another era. This friction is visible in inventory management, particularly in recurring stockouts.

Stockouts matter in omnichannel environments because they expose the gap between what is promised and what is delivered. That gap affects operational efficiency and, more enduringly, customer trust (Heizer et al., 2020; Christopher, 2016). A customer who finds a product advertised as available and then discovers during the purchase process that it is not may lower expectations and become less inclined to purchase again.

The conventional view treats a stockout as an inventory-control failure. This interpretation is insufficient to explain the complexity of the phenomenon.

It reasonably explains isolated incidents, but it does not account for why stockouts persist in organizations that have invested in better tools.

This study proposes that stockouts can be understood as visible manifestations of a deeper organizational misalignment. Three conditions contribute to their occurrence: fragmented processes, inconsistent information across sources, and decision structures based on divergent objectives. Together, they shape the organization's ability to sustain omnichannel consistency over time.

This article analyzes the relationship among omnichannel consistency, inventory management, and stockout reduction in Paraguayan retail. The objective is to provide an integrated organizational perspective that can inform both academic research and the day-to-day decisions managers actually face.

METHODOLOGY

This study adopts a qualitative approach with a documentary-analytical design and exploratory scope, complemented by accumulated professional experience in the Paraguayan retail sector as a contextualization resource. This choice reflects the nature of the research problem, because understanding stockouts as organizational phenomena requires interpreting the interaction among processes, information, and decisions.

The documentary corpus integrates peer-reviewed contributions from three converging fields: supply chain management, omnichannel retail, and organizational theory. These sources were selected for their conceptual relevance to the relationship among channel consistency, inventory

management, and organizational alignment. They were subsequently examined through a critical reading aimed at identifying recurring conceptual categories and relationships. The analysis followed an iterative conceptual coding process in which recurring themes were grouped into three organizing dimensions: process integration, information consistency, and decision alignment.

Professional experience was used exclusively as a resource for contextualizing and interpreting the phenomenon in the Paraguayan market. This component does not constitute fieldwork or an independent empirical source. Because this is a conceptual and exploratory study, its purpose is to build an integrated framework rather than test hypotheses or establish causal relationships. The limitations of the approach and the conditions required for subsequent empirical validation are addressed in the final considerations.

THEORETICAL FRAMEWORK

Omnichannel retail as a transformation of the management model

Omnichannel retail is not simply a stage that follows the multichannel approach; rather, it represents a structural change in how retail management is organized. Whereas multichannel approaches allow channels to operate in parallel with limited coordination, omnichannel approaches seek to provide consistent, frictionless interaction across the different customer touchpoints (Verhoef et al., 2015).

This transformation goes beyond the adoption of digital technologies because it entails reconfiguring organizational structures, processes, and decision-making mechanisms. Berman and Thelen (2018) note that effective omnichannel implementation requires alignment among marketing, operations, and information systems to maintain consistency in value delivery.

Distribution systems must also be redesigned. Options such as in-store pickup, home delivery, and cross-channel returns add operational complexity and require coordination among functions that previously operated independently (Hübner et al., 2016).

There is also a shift from channel-centered structures to customer-oriented structures. Although this transition may appear straightforward conceptually, in practice it challenges existing organizational silos because sales, logistics, and customer service must act as parts of an integrated system rather than optimizing only their own performance indicators.

Available evidence suggests that this transformation is often incomplete. Some organizations add digital channels without comprehensively redesigning their processes, resulting in hybrid configurations that can create execution inconsistencies. Inventory management and service delivery are two areas in which these inconsistencies become particularly visible.

Omnichannel consistency as an organizational outcome

Omnichannel consistency describes the degree of coherence perceived by customers in areas such as pricing, product availability, service conditions, and the overall shopping experience. Although it is manifested in the customer experience, the conditions that explain it are also found within the organization.

Berman and Thelen (2018) point out that consistency does not arise solely from integrating customer-facing interfaces. Internal processes and systems must also be synchronized. In this sense, what the customer perceives reflects the organization's internal ability to coordinate its resources, processes, and information.

Melero et al. (2016) show that inconsistencies across channels reduce customer trust and

negatively affect purchase intention. Differences in availability data between digital channels and physical stores, as well as discrepancies in prices or service conditions, do not always result from isolated errors. They may also be related to structural causes, such as fragmented information systems, insufficiently integrated processes, and the absence of shared decision-making criteria.

From this perspective, omnichannel consistency is not merely an outcome of channel design but an emergent property of organizational alignment. Consequently, the analytical focus shifts from customer-facing interfaces to the underlying organizational dynamics that help shape the customer experience.

Inventory management in omnichannel environments

Traditionally, inventory management has been understood as a balance between holding costs and service levels. In omnichannel environments, this balance becomes more complex because inventory becomes a central element of the value offered to customers rather than merely a component of operating cost.

Chopra and Meindl (2019) argue that inventory decisions should consider responsiveness and flexibility in addition to efficiency. Demand variability across multiple order-fulfillment and delivery options makes the traditional optimization logic insufficient.

Complexity increases because the same inventory must simultaneously serve transactions conducted through physical and digital channels. Simchi-Levi et al. (2021) identify the lack of integrated inventory visibility as one of the main sources of inefficiency in modern retail systems.

In the Paraguayan market context, the problem is not always related exclusively to the physical absence of the product. It may also arise from its location, allocation, or visibility across channels. In these cases, the inventory exists but is not available to the channel or customer demanding it.

Real-time data and analytics have increased requirements for inventory accuracy. However, the effectiveness of these tools depends on the quality of the data they process. In fragmented environments, data-driven systems may amplify existing inconsistencies rather than resolve them by generating technically precise reports from unreliable underlying information.

Stockouts as systemic indicators

A stockout occurs when a product is unavailable at the time demand arises. The traditional perspective focuses its analysis on replenishment processes and demand forecasting.

Omnichannel environments broaden this concept. In this context, a stockout may also include situations in which the information presented to the customer does not match actual inventory, such as when a product appears available in one channel but cannot be delivered, or when it physically exists but is not visible to the channel that requires it.

Heizer et al. (2020) document the direct impact of stockouts on customer satisfaction and operational performance. Christopher (2016) examines the same phenomenon from a supply chain perspective and notes that supply chain inefficiencies can manifest as service failures, among which product unavailability is one of the most visible.

From a systemic perspective, a stockout may indicate deeper deficiencies. It can help identify points at which coordination among processes, systems, and decision structures is experiencing difficulties.

For example, discrepancies between inventory data in physical and digital channels may be related to delayed system updates or insufficient data-governance practices. Likewise, promotional

campaigns implemented without first verifying inventory availability may generate demand that operations are unable to meet. In both cases, the stockout is the visible event, while organizational misalignment represents a possible underlying cause.

This perspective shifts the analytical focus from reactive correction to structural diagnosis. The question is no longer limited to how to correct a specific stockout; instead, it focuses on identifying which organizational elements contribute to its recurrence.

Process management and organizational alignment

Process management offers a way to overcome traditional functional silos. This approach proposes organizing work around value streams that cross different functional areas rather than structuring it exclusively around departments that optimize their results independently. In omnichannel retail, this perspective is especially relevant because the customer experience depends on processes that integrate sales, logistics, information technology, and customer service.

A process-oriented organization is structured around end-to-end workflows. Predominantly functional organizations, by contrast, may encourage each department to optimize its own performance indicators even when doing so negatively affects the system as a whole. This fragmentation creates barriers to coordination and encourages inconsistencies.

Moving toward process integration is not merely a structural exercise. It also requires cultural change that enables roles to be redefined, shared performance indicators to be established, and sustained collaboration practices to be developed among organizational units. Without these conditions, improvements implemented in inventory, digital platforms, or logistics may remain confined to specific areas and lose continuity over time.

Data governance and decision-making

Data governance plays a less visible but decisive role in this discussion. Its purpose is to help ensure that the information used in decision-making is reliable, consistent, and aligned with organizational needs. In omnichannel environments, where decisions increasingly depend on near-real-time data, information quality becomes an important condition of organizational performance.

Davenport and Ronanki (2018) maintain that advanced analytics and artificial intelligence produce meaningful results when supported by high-quality data and clearly defined processes. Without these conditions, technology can generate apparently precise results from unreliable inputs.

Sharda et al. (2020) extend this argument to organizational structure. Data-driven decision-making requires not only technical capability but also structures that support integration and shared interpretation of information across different functions.

In fragmented environments, these gaps may appear in everyday operations. Demand forecasts may differ across departments, inventory records may be inconsistent, and decisions may be based on incompatible versions of the same reality. As a result, some channels may experience overstock while others experience stockouts.

Therefore, data governance should be considered a fundamental element of omnichannel consistency rather than merely a maintenance function belonging to the information technology department. Proper implementation helps maintain accurate, accessible, and consistent information, providing a foundation for coordinated decision-making.

PRESENTATION AND ANALYSIS OF RESULTS

The analysis begins by questioning a common assumption: that technological capability is the primary driver of omnichannel performance. The review shifts attention toward organizational alignment as a central condition for achieving operational coherence. This relationship is particularly relevant in the Paraguayan context, characterized by the progressive adoption of digital channels and tools in the retail sector.

The growing availability of digital tools and advanced analytics solutions has not automatically translated into greater operational coherence. In some cases, new technologies are added to existing organizational structures with insufficient levels of integration, which may reinforce preexisting inconsistencies rather than resolve them.

Inventory management and recurring stockouts make this phenomenon visible. Although these events manifest at the operational level, their causes may be related to broader organizational conditions.

From this perspective, omnichannel retail is not exclusively a technological challenge but an organizational transformation that requires the simultaneous alignment of processes, information, and decision-making mechanisms.

The organizational nature of omnichannel challenges

The conceptual analysis suggests that several of the main barriers to omnichannel consistency are organizational rather than exclusively technological. Functional areas such as marketing, logistics, and operations may work with different objectives and performance indicators. This fragmentation limits coordination capacity and may affect consistency across channels.

A representative example is the design of promotional strategies without adequate coordination with inventory availability. This situation may produce increases in demand that operations cannot meet, customers encountering out-of-stock products, and items advertised in digital channels that ultimately are unavailable. As a result, service-level failures arise for which responsibility may not be clearly defined. At the same time, logistics operations may meet their efficiency indicators in isolation even when those indicators conflict with omnichannel service expectations.

These misalignments are not merely isolated operational errors; they may reflect structural tensions within the organization that manifest as failures perceived by customers. Addressing them requires moving from functional optimization toward systemic coordination, a transformation involving deeper changes than the simple acquisition of technological tools.

Inventory management as a point of organizational integration

Inventory management is a critical point of integration between commercial strategy and operational execution. In omnichannel environments, inventory is not a passive resource but an active component of value creation whose performance reflects the degree of coordination within the organization.

Effective inventory management depends on technical accuracy, but also on its integration with broader organizational processes. When inventory systems operate independently from commercial planning or customer service, the likelihood of inconsistencies increases.

One situation that may occur in practice is the existence of multiple, uncoordinated inventory records across different systems. These records represent the same physical reality but may provide divergent information. As a result, products may appear available when they actually are not,

transactions may fail, and customer trust may deteriorate. Likewise, inventory-allocation logic may respond to internal priorities rather than customer needs. This demonstrates the need to treat inventory management as a cross-functional process rather than an exclusively logistics activity.

Stockouts as manifestations of systemic misalignment

Stockouts can be reinterpreted from a systemic perspective. Traditionally, they have been considered operational inefficiencies. Although this interpretation is valid, it is insufficient to explain their recurring nature. Their persistence may reflect organizational difficulties in maintaining coherence among processes, information systems, and decision-making mechanisms.

The analysis identifies three main sources of misalignment. The first is process fragmentation, which occurs when commercial, logistics, and digital processes are not integrated end to end. The second is information inconsistency, generated when data from different systems do not agree. The third is decision-making misalignment, which occurs when decisions are made without shared criteria across the organization's different areas.

Figure 1. Three Dimensions of Organizational Misalignment

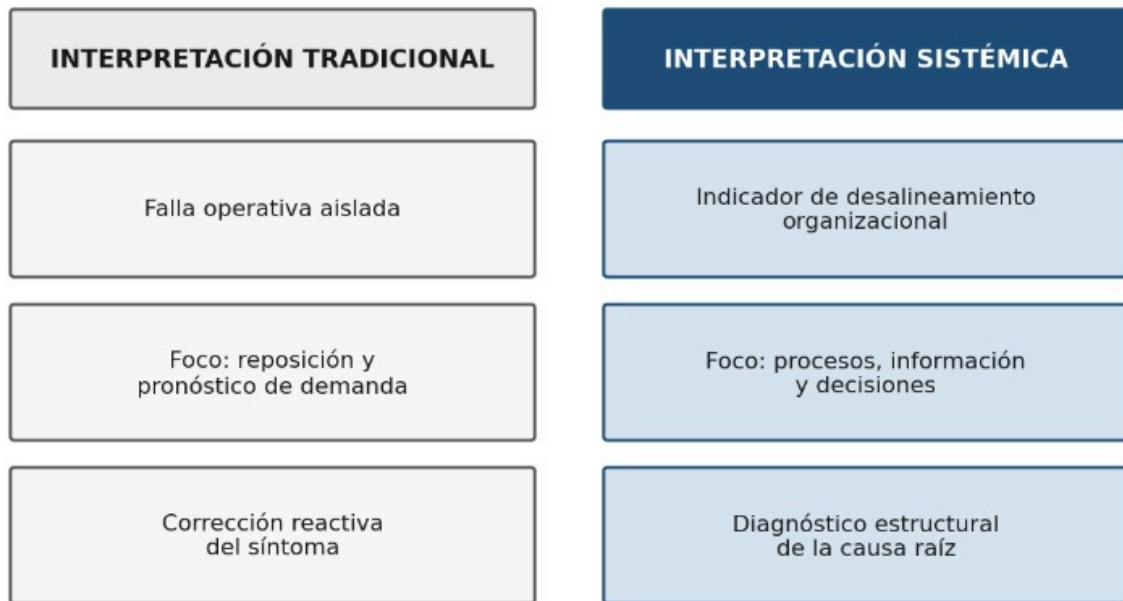


Source: Authors' own work (2026).

These dimensions do not operate in isolation; rather, they form an interconnected system in which deficiencies in one dimension can spread to the others. For example, inaccurate inventory data may feed inadequate demand forecasts, lead to poor replenishment decisions, and ultimately generate stockouts. This sequence is not always visible to customers, although its effects may be directly manifested in their shopping experience.

The systemic perspective changes how organizational interventions are interpreted. Correcting individual symptoms, such as making a one-time adjustment to a forecast or accelerating a replenishment, may be insufficient to address the underlying mechanisms. Therefore, sustainable stockout reduction requires strengthening organizational alignment in addition to implementing specific operational adjustments.

Figure 2. Traditional versus Systemic Interpretation of Stockouts



Source: Authors' own work (2026)

A systemic interpretation of omnichannel inconsistency

Based on the analysis developed, omnichannel inconsistency can be interpreted as an emergent manifestation of organizational misalignment. Problems perceived by customers, such as inaccurate availability information, delivery delays, and price differences across channels, may constitute observable outcomes of structural deficiencies related to the management of processes, information, and decisions.

This perspective challenges approaches focused exclusively on optimizing individual components. As an alternative, it proposes an integrated intervention that considers the organization as an interdependent system. From a managerial standpoint, this entails reviewing organizational design, redefining roles, and establishing effective coordination mechanisms among different areas that are capable of responding appropriately under operational pressure.

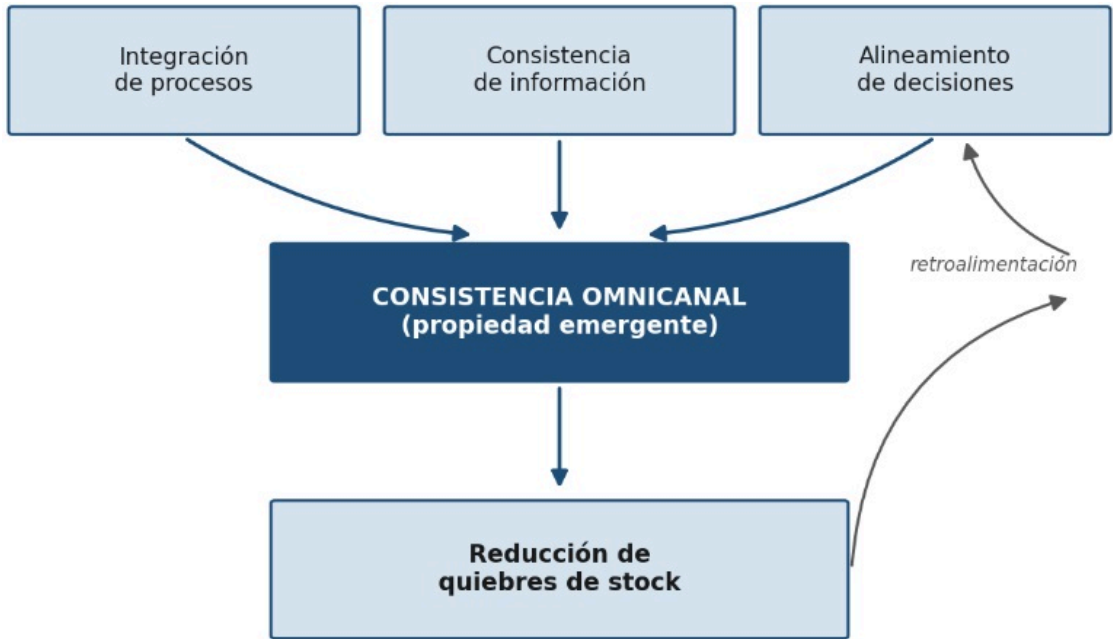
A conceptual framework: stockouts as systemic indicators

Based on the analysis, a conceptual framework is proposed in which stockouts function as systemic indicators of organizational misalignment. The framework is structured around three central dimensions: (1) process integration, (2) information consistency, and (3) decision alignment.

These dimensions interact dynamically. A weakness in any one of them may produce distortions in the others and subsequently manifest as an operational inconsistency, including stockouts. Within this framework, omnichannel consistency is not considered a direct and exclusive result of technological implementation, but rather an emergent property that becomes stronger when the organizational dimensions are aligned.

The framework provides a structure for diagnosing organizational problems and directing interventions toward their possible underlying causes rather than focusing solely on their visible manifestations. In this way, it can help identify difficulties that limit the implementation and continuity of improvement programs in the retail sector.

Figure 3. Systemic Organizational Alignment Framework for Omnichannel Consistency

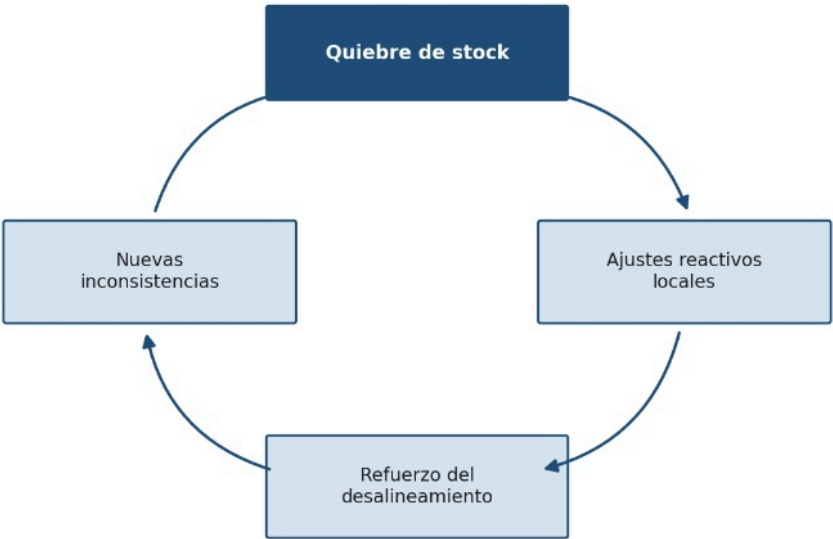


Source: Authors' own work (2026)

Figure 3 represents the proposed systemic logic. Stockouts are not interpreted solely as isolated operational failures but as possible outcomes of misalignment among organizational dimensions. Process integration, information consistency, and decision alignment interact to promote or constrain omnichannel consistency. When alignment weakens, inconsistencies may arise that ultimately manifest as stockouts.

The feedback loop represents a potentially recurring dynamic. Stockouts not only reflect existing problems; they may also influence subsequent decisions and adjustments. If these responses are limited to correcting the specific event without addressing its organizational causes, they may contribute to reproducing the same misalignment that caused the problem. Consequently, the system should not be interpreted as a static structure.

Figure 4. Feedback Loop: Stockouts and Organizational Adjustment



Source: Authors' own work (2026)

Managerial implications

Several implications for managerial practice follow from the proposed conceptual framework.

First, approaches focused exclusively on technology have limitations when they do not consider organizational alignment. Investments in digital tools and analytics should be accompanied by process integration and alignment of decision structures. Otherwise, they may intensify preexisting organizational deficiencies.

Second, data governance requires priority attention. The availability of reliable, consistent, and accessible information provides a foundation for effective decision-making and for maintaining coherence across channels.

Third, inventory management should be regarded as a cross-functional process. This requires close coordination among commercial, logistics, and digital functions, as well as a clear definition of responsibilities related to end-to-end process management.

Finally, the required transformation is both cultural and structural. Collaboration and shared accountability across functional areas are practices that take time to consolidate. Therefore, omnichannel transformation should be approached as a medium- and long-term organizational process rather than merely as a limited-duration initiative.

CONCLUSION

The analysis of the transformation of Paraguayan retail supports the conclusion that omnichannel consistency does not depend exclusively on the adoption of technology. Although digital tools and advanced analytics are increasingly accessible, their effectiveness is conditioned by organizations' ability to integrate processes, maintain consistent information, and coordinate their decisions.

From this perspective, stockouts can be interpreted as systemic manifestations of organizational misalignment rather than merely as isolated operational failures. Their recurrence may signal structural deficiencies related to fragmented processes, inconsistent information, and insufficiently coordinated decisions, which are unlikely to be resolved through isolated technological investments.

Under this interpretation, inventory management takes on a strategic role. It connects commercial intent with operational execution, and its effectiveness depends both on technical accuracy and on integration with organizational processes and structures.

Consequently, omnichannel consistency can be understood as an emergent property of organizational coherence. Improving retail performance requires complementing technological strategies with actions aimed at process integration, information consistency, and decision alignment.

Theoretical contribution

The study's main theoretical contribution is to propose interpreting stockouts as systemic indicators of organizational misalignment.

The literature has examined stockouts primarily from operational and logistics perspectives. This study integrates contributions from supply chain management, omnichannel retail, and organizational theory to provide a broader interpretation. By considering stockouts as phenomena emerging from the interaction among process integration, information consistency, and decision alignment, the study broadens the theoretical discussion through a multidimensional view of retail performance.

The proposed framework also helps connect operational and organizational approaches applied to the study of retail. From this perspective, internal coherence, in addition to technological capability,

is a central condition for service reliability in omnichannel environments. The framework provides a conceptual structure for analyzing this relationship.

Managerial contribution

From a managerial standpoint, the study offers several guidelines for organizational practice.

First, isolated technological solutions have limitations. Investments in digital tools and analytics should be complemented by actions aimed at integrating processes and aligning organizational structures. Otherwise, technology may become a costly and underused resource.

Second, data governance needs to be strengthened. The availability of reliable and consistent information is essential to support informed decisions and maintain alignment across channels. Therefore, this dimension should receive attention proportional to its importance within the omnichannel strategy.

Third, inventory management should be reframed as a cross-functional process. Coordination among commercial, logistics, and digital functions is an essential requirement for omnichannel management and requires a clear definition of responsibilities.

Finally, organizational transformation is a fundamental condition. Cultural change, shared performance indicators, and collaboration across functional areas help sustain structural changes over time.

Limitations and future research

Several limitations should be considered when interpreting the results of the analysis.

The study adopts a qualitative documentary-analytical approach, complemented by professional experience as a contextualization resource. This combination allows for a contextualized interpretation of the phenomenon but does not permit statistical generalizations or the establishment of causal relationships. Consequently, the framework should be considered an interpretive proposal rather than an empirically tested causal model.

The focus on Paraguayan retail also limits the direct transferability of the results. Other markets, with different levels of maturity, regulatory environments, and organizational cultures, may exhibit variations in these dynamics. Although the framework may serve as a reference in other contexts, its application will require adaptations and subsequent validation processes.

Future research can extend this work in several directions. Case studies and quantitative analyses could empirically evaluate the relationships proposed in the conceptual framework. Likewise, comparative studies across countries or retail formats could strengthen its transferability. Finally, analyzing emerging technologies, such as artificial intelligence and predictive analytics, under different organizational conditions could provide deeper insight into aspects that this study addresses only exploratorily.

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