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Minimizing Human Error in the Supply Chain: A Case Study of the Fresh Bakery Division at PT Lotte Mart Indonesia, Bandung

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Abstract

This applied research and community service initiative addresses the critical issue of operational inefficiencies driven by human error within retail supply chains. To resolve this problem, the research team aims to identify the root causes of human error in the supply chain process and deliver actionable mitigation strategies tailored for the Fresh Bakery Division at PT Lotte Mart Indonesia, Bandung. The study employs a qualitative research methodology, mobilizing a collaborative team of university lecturers and students to gather field insights. The data collection process relies on semi-structured interviews and observations with corporate business actors and front-line operational executors who serve as key informants. The empirical findings reveal that specific communication gaps and manual entry steps trigger frequent PO discrepancies, which subsequently disrupt inventory flows. Based on these insights, this study provides structured protocols, digital double-check mechanisms, and targeted training interventions that effectively minimize human error.

Keyword: *Supply Chain, Human Error, Purchase Order, Fresh Bakery, Qualitative Approach, Retail Management*

Introduction

Supply Chain Management (SCM) operates as an integrated managerial approach that orchestrates all activities across the supply chain, encompassing raw material procurement, manufacturing processes, warehousing, and final product distribution to consumers. Jaboob et al. (2024) establish the fundamental foundation of SCM within operations management, demonstrating that seamless coordination across the network directly equips modern business ventures with the structural agility required to navigate competitive markets. Far beyond merely controlling the physical movement of goods, SCM synthesizes the parallel flows of data, communication, and financial transactions throughout the network. Within operations management frameworks, SCM functions as a critical system that links suppliers, distributors, retailers, and customers into a single interdependent network. This systemic integration strategically minimizes operational friction, enhances market responsiveness, and fosters long-term sustainability. (Foster & Sidharta, 2019; Manik et., 2023) To achieve this responsiveness, companies increasingly upgrade their coordination tools, Khedr (2024) highlights how integrating machine learning and deep learning techniques into SCM optimizes data flows, accurately predicts logistics demands, and actively prevents operational disruptions.

Beyond technological tracking, modern SCM practices must absorb external disruptions as Ngo et al. (2024) prove that dynamic SCM practices significantly mitigate sustainability-related supply chain risks, shielding overall corporate performance from unexpected market and environmental shocks. The integration connects resource flows with environmental responsibility as Karmaker et al. (2023) demonstrate that embedding Industry 4.0 technologies within SCM practices drives green supply chain performance and supports a circular economy, validating that smart integration creates highly efficient and sustainable industrial lifecycles.

Based on the situational analysis of the Fresh Bakery Division at PT Lotte Mart Indonesia, precise execution of the Purchase Order (PO) process proves vital to avoid stock surpluses or deficits. Errors within this workflow

directly damage product quality, sales figures, and customer satisfaction. However, operational practices show that the PO process frequently suffers from human errors, such as manual data-entry mistakes, duplicate orders, or miscalculated order quantities.

These human errors trigger severe bottlenecks across the supply chain, including delivery delays, inventory accumulation, and escalating operational costs. Furthermore, such mistakes actively undermine the efficiency and responsiveness of the supply chain in meeting consumer demand. If management fails to resolve these inefficiencies, they will ultimately degrade overall corporate performance. Therefore, the team must identify these systemic issues and deliver targeted solutions to minimize human error during the purchase order process.

Method

To achieve the research objectives, this study employs a qualitative research methodology based on an empirical fieldwork design. A collaborative research team consisting of university lecturers and students directly executes the project to investigate real-world operational challenges. The study establishes the Fresh Bakery Division at PT Lotte Mart Indonesia, Bandung, as the primary object of research. To gather deep, contextual insights into daily workflows, the research team selects key informants through purposive sampling. These informants include corporate business actors, managers, and front-line operational workers who directly handle the day-to-day logistics and procurement processes. The team collects primary qualitative data by conducting structured on-site observations and extensive, semi-structured interviews with these informants.

The core research variable focuses on Supply Chain Management (SCM), specifically examining the efficiency, accuracy, and vulnerability of information and material flows during the procurement cycle. Finally, the

study utilizes qualitative thematic analysis to process the gathered data. The research team transcribes the interviews, codes the operational observations, and categorizes the findings to map specific human error patterns within the Purchase Order process. This analytical technique allows the team to identify systemic vulnerabilities, diagnose root causes of supply chain disruptions, and formulate actionable, structured solutions to minimize human error in the bakery's retail operations.

Results and Discussion

Although advanced technologies like Enterprise Resource Planning (ERP) systems, warehouse automation, and data digitalization significantly enhance Supply Chain Management (SCM) efficiency, human intervention remains irreplaceable. In practice, direct human involvement across various operational stages continuously introduces the potential for mistakes, widely known as human error. These errors represent systemic deviations resulting from human factors—whether intentional or unintentional—that directly compromise overall supply chain performance.

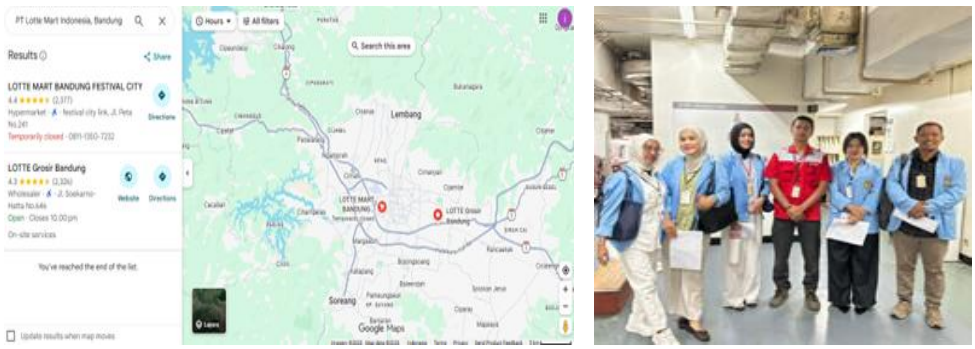

Figure 1. The Fresh Bakery Division at PT Lotte Mart Indonesia, Bandung.

Human errors in SCM occur across multiple critical phases. For instance, employees frequently make manual data-entry mistakes when processing purchase orders, miscalculate physical inventory levels during stock counts, pick incorrect items from warehouse racks, or fail to communicate effectively during distribution cycles. The consequences of

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these slips ripple severely throughout the entire logistical network. Specifically, human errors trigger delivery delays, cause inventory discrepancies, escalate operational costs, and ultimately erode customer satisfaction.

Figure 2. The Fresh Bakery Division at PT Lotte Mart Indonesia, Bandung.

Consequently, modern businesses must analyze the root causes, types, and impacts of human error within their supply chains. By developing a comprehensive understanding of these vulnerabilities, companies can design and implement targeted mitigation strategies. Enterprises can successfully minimize manual operational risks and secure a highly reliable supply chain by systematically upgrading employee competencies, enforcing strict Standard Operating Procedures (SOPs), and deploying fail-safe technologies that eliminate unnecessary manual touchpoints.

Figure 3. Stock at the Fresh Bakery Division

In contemporary Supply Chain Management (SCM), competitive success depends on more than just the rapid physical distribution of goods; it requires a firm to maintain a delicate balance between product availability, minimal operational costs, and high customer satisfaction. At PT Lotte Mart Indonesia, the supply chain plays an exceptionally critical role because the company operates in a modern retail sector that processes thousands of product lines under highly dynamic consumer demand. Overall, the operational landscape at PT Lotte Mart Indonesia demonstrates that seamless system integration, robust stakeholder coordination, and strategic technology adoption serve as the primary drivers for maintaining operational efficiency and elevating customer satisfaction. By optimizing these supply chain flows, the enterprise successfully protects its market share and secures a sustainable advantage in a fiercely competitive retail industry.

Technological Integration and Advanced Analytics

To maintain the required balance between inventory and demand, modern retailers must move away from reactive logistics and adopt proactive, tech-driven frameworks. Oyewole et al. (2024) demonstrates that integrating predictive analytics into SCM allows firms to forecast volatile consumer trends accurately, thereby optimizing stock levels and preventing the financial losses associated with overstocking or stockouts. This analytical

foresight thrives on digital infrastructure; as Mohsen (2023) notes, recent developments in digital technologies—such as cloud platforms, IoT, and automated tracking—directly revolutionize SCM by providing real-time data visibility across the entire corporate network, which allows retail giants like Lotte Mart to synchronize their operations instantaneously.

Overcoming Disruptions and Building Core Necessities

However, maintaining a smooth retail flow requires constant vigilance against operational friction. Kanike (2023) identifies the various internal and external factors that frequently disrupt supply chain management, warning that manual process bottlenecks, communication silos, and coordination failures can severely degrade logistical performance. To buffer against these vulnerabilities, organizations must treat technological and collaborative integration not as optional upgrades, but as foundational prerequisites. This perspective aligns with the theoretical framework of Bokrantz & Dul (2023), who utilize necessity theories to prove that specific operational capabilities—such as tight system integration and accurate information sharing—act as absolute necessities; without them, a supply chain simply cannot achieve high performance or survive market disruptions.

Based on the operational analysis, even though PT Lotte Mart Indonesia utilizes an Enterprise Resource Planning (ERP) system to manage its Purchase Order (PO) process, human errors such as order duplication and manual data-entry mistakes still occur. To eliminate these vulnerabilities, the company must optimize its system capabilities and strengthen operational controls through the following strategic interventions:

Activate Automated Validation Features in the ERP. Management must leverage the built-in validation features within the ERP system to actively prevent duplicate POs. Specifically, the system should automatically detect any incoming orders that share identical items, dates, and quantities. When the system flags a potential duplication, it must trigger an immediate

notification or warning screen. Furthermore, the ERP should automatically reject any data entry that exceeds predefined inventory thresholds.

Implement Multi-Level Approval Workflows. Every Purchase Order—especially high-value or large-volume orders—must undergo a strict verification process. The company needs to institute a tiered approval system within the ERP, requiring supervisors or divisional managers to electronically review and sign off on orders before final transmission to suppliers.

Enforce Strict Access Controls. The company must restrict full access to the PO system to prevent unauthorized changes. Implementing a clear separation of roles ensures that different employees handle inputting, reviewing, and approving orders. Additionally, the system must block users from editing or altering PO data once submitted, completely locking the dataset after final approval.

Standardize SOPs and PO Checklists. Because employees frequently make mistakes when working under time pressure or without clear guidance, the company must establish rigid Standard Operating Procedures (SOPs). Mandatory, step-by-step checklists will guide operators through the verification process, ensuring accuracy during high-volume periods.

Conduct Regular Employee Training and Evaluation. Since the human factor remains crucial to supply chain success, management must conduct routine ERP training sessions. These programs should include simulations of common PO error scenarios to sharpen employee troubleshooting skills. Furthermore, HR should track individual performance metrics, specifically monitoring error frequency to identify where workers need additional support.

Leverage ERP Data for Demand Forecasting. To reduce procurement mistakes, the division should utilize historical sales data stored within the ERP. By analyzing daily and seasonal demand patterns, the system can automatically or semi-automatically calculate and adjust purchase order quantities, matching actual inventory needs.

Establish Routine Monitoring and Audits. Finally, the enterprise must perform regular audits of all PO data. By continuously tracking error patterns—such as duplicate orders and incorrect inputs—the management team can conduct productive weekly or monthly evaluations to continuously improve supply chain reliability.

The studies confirm that PT Lotte Mart Indonesia's focus on digital tools and synchronized coordination matches global best practices. By mitigating internal operational risks through technology, the enterprise systematically eliminates supply chain friction, protects its profit margins, and delivers consistent value to the modern consumer.

Conclusion

This field research demonstrates that while PT Lotte Mart Indonesia, Bandung, utilizes an Enterprise Resource Planning (ERP) system, the Fresh Bakery Division still suffers from frequent human errors during the procurement cycle. Specifically, the team identified recurring operational slips, including duplicate orders (double POs), incorrect data-entry quantities, and delayed order placements. These mistakes primarily stem from a lack of employee precision, high operational workloads, and underutilized ERP control features. Consequently, these human errors severely damage supply chain performance by creating costly overstock situations that lead to product waste, while simultaneously reducing responsiveness through unexpected stockouts that trigger lost sales.

This study enriches operations management literature by exploring the intersection of human factors and technology within retail logistics. It proves that advanced software like ERP systems cannot guarantee operational efficiency unless an organization pairs the technology with robust human-centric validation protocols and workload balances. For retail managers, these findings highlight a direct link between front-line administrative

precision and bottom-line financial health in the fresh food sector. By resolving procurement mistakes, the store can simultaneously protect its profit margins, eliminate perishable waste, and maintain consistent product availability on the shelves. To mitigate human error and optimize supply chain stability, the management of PT Lotte Mart Indonesia should implement the following targeted actions: Optimize ERP Automated Defenses; Redesign Workflows and Workloads; Enforce Multi-Level Approvals.

Several boundary conditions limit the scope of this study. First, the qualitative field insights reflect the specific operational landscape of a single fresh bakery division within one retail branch in Bandung, which restricts the direct generalizability of the findings to non-perishable departments. Second, the study focuses heavily on internal administrative errors within the Purchase Order process rather than tracking external supplier disruptions. Future researchers should expand this investigation by analyzing human error across multiple retail branches or comparing different fresh food departments (such as produce or meat) to identify broader industry patterns. Additionally, future studies should employ quantitative or mixed-method designs to precisely measure how specific workload levels mathematically correlate with data-entry error rates.

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