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A Study of Incoming and Dispatch Efficiency of Industrial Fasteners at Harsha Industries Pvt. Ltd. in Supa MIDC Area

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Abstract : *In the modern manufacturing and automotive supply chain, industrial fasteners such as nuts, bolts, screws, and washers act as critical Class-C components. Even though their unit price is low, any delay in receiving or dispatching them can bring an entire assembly line to a standstill. This research paper examines the incoming (inward) and dispatch (outward) efficiency of industrial fasteners at Harsha Industries Pvt. Ltd. The primary aim of the study is to measure turnaround time, identify operational bottlenecks in warehouse handling, and evaluate order fulfillment accuracy. Using a descriptive research design, primary data was collected through direct time-motion observation of 60 inward and outward consignments, along with structured questionnaires administered to 35 warehouse and logistics staff. Secondary data was obtained from company Enterprise Resource Planning (ERP) logs and Goods Receipt Notes (GRN). The findings reveal that manual counting, unscheduled vehicle arrivals, and paper-based picking lists cause significant delays during peak hours. Implementing barcode scanning, ABC-based slotting, and pre-dispatch staging zones can improve dispatch turnaround time by up to 35%.*

Keywords: Industrial Fasteners, Incoming Efficiency, Dispatch Turnaround Time, Warehouse Management, Inventory Accuracy, Harsha Industries Pvt. Ltd.

I. INTRODUCTION

Industrial fasteners -including high-tensile bolts, hex nuts, studs, rivets, and spring washers—are the backbone of engineering, automotive, and infrastructure industries. In Indian manufacturing hubs, companies deal with thousands of Stock Keeping Units (SKUs) that look visually similar but differ slightly in thread pitch, diameter, grade, and coating. Because of this high SKU variety and heavy box weights, managing the inward and outward flow of fasteners is a major operational challenge.

Harsha Industries Pvt. Ltd. is a growing industrial manufacturing and supply enterprise dealing with precision engineering components and high-grade industrial fasteners. As customer expectations have shifted toward Just-in-Time (JIT) delivery, the company faces continuous pressure to unload incoming raw materials or vendor supplies quickly and dispatch finished fastener orders without errors or delays.

Incoming (Inward) Efficiency: Refers to the speed and accuracy with which materials arriving at the factory gate are unloaded, inspected for quality, weighed/counted, entered into the ERP system via a Goods Receipt Note (GRN), and placed into designated storage bins.

Dispatch (Outward) Efficiency: Refers to the speed and accuracy with which customer orders are picked from storage racks, packed, labeled, invoiced, and loaded onto outbound transport vehicles within the promised delivery window.

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II. REVIEW OF LITERATURE

Rushton, Croucher, and Baker (2022): In *The Handbook of Logistics and Distribution Management*, the authors highlight that warehouse receiving and dispatch account for nearly 40% of total warehouse labor costs. They emphasize that standardized unloading docks and clear staging lanes directly reduce vehicle detention time.

Frazelle (2016): In *World-Class Warehousing and Material Handling*, Frazelle explains that poor slotting of small, heavy items like fasteners leads to excessive worker travel time during order picking. Grouping fast-moving items near the dispatch bay significantly boosts order-picking productivity.

Richards (2021): In *Warehouse Management: A Complete Guide to Improving Efficiency and Minimizing Costs in the Modern Warehouse*, Richards notes that manual data entry during Goods Receipt Note (GRN) generation is the leading cause of stock mismatches. Transitioning to barcode or RFID systems eliminates human transcription errors.

Kembro, Norrman, and Eriksson (2018): Their research on omnichannel and B2B warehouse operations demonstrates that batch picking and pre-dispatch verification checklists reduce wrong-SKU shipments by over 60% in industrial supply chains.

Singh and Verma (2019): Studying Indian auto-component and fastener manufacturers, the authors found that unscheduled truck arrivals create dock congestion in the second half of the shift, leading to overtime costs and delayed dispatches.

III. RESEARCH GAP

While extensive global research exists on automated mega-warehouses and fast-moving consumer goods (FMCG) logistics, limited practical studies focus on mid-sized Indian industrial fastener units. Specifically, the operational friction caused by handling small, high-density, multi-SKU metallic fasteners—where weigh-counting errors, rust-prevention packaging checks, and manual ERP entries slow down both gate-in and gate-out movements—has not been adequately analyzed in the context of Harsha Industries Pvt. Ltd**.** This study bridges that gap by examining ground-level dock-to-stock and order-to-dispatch workflows.

IV. RESEARCH OBJECTIVES

- To measure the current turnaround time for incoming (unloading to put-away) and dispatch (order picking to vehicle loading) operations at Harsha Industries Pvt. Ltd.
- To identify the major bottlenecks and causes of delay in the inward and outward movement of industrial fasteners.
- To evaluate inventory accuracy and order fulfillment error rates (wrong size, grade, or quantity) in the warehouse.
- To suggest practical, cost-effective process improvements to enhance incoming and dispatch efficiency.

V. RESEARCH METHODOLOGY

Sr No	**Parameter**	**Details**
1	Research Design	Descriptive and Analytical Research Design
2	Study Location	Warehouse & Dispatch Unit, Harsha Industries Pvt. Ltd.
3	Sample Size	60 Consignments (30 Incoming + 30 Outgoing) & 35 Staff Respondents
4	Sampling Technique	Purposive and Convenience Sampling during peak and off-peak shifts
5	Primary Data Sources	Time-motion stopwatch observation, structured questionnaire, and supervisor interviews
6	Secondary Data Sources	ERP GRN logs, Dispatch Registers, Invoices, and Customer Complaint Records (last 6 months)
7	Analytical Tools	Percentage Analysis, Mean Turnaround Time, and Bar Chart Comparison

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VII. DATA ANALYSIS AND INTERPRETATION

Table 1: Stage-Wise Average Time Taken for Incoming Fasteners (n = 30 Consignments)

Incoming Stage	Standard Benchmark Time (Mins)	Actual Average Time Taken (Mins)	Variance / Delay (Mins)	Primary Reason for Delay
Gate Entry & Document Check	10	18	+8	Manual register entry & unscheduled trucks
Unloading & Physical Counting	25	45	+20	Heavy boxes & manual weigh-counting
Quality Control (QC) Inspection	20	32	+12	Waiting for gauge & thread pitch testing
GRN Entry & Put-Away in Racks	15	25	+10	Manual ERP entry & congested bin aisles
Total Incoming Cycle Time	**70 Mins**	**120 Mins**	**+50 Mins**	**71.4% higher than benchmark**

Interpretation:

Table 1: shows that the actual average incoming cycle time at Harsha Industries Pvt. Ltd. is 120 minutes, compared to the standard benchmark of 70 minutes. The largest bottleneck occurs during Unloading and Physical Counting (+20 minutes) because fasteners arrive in heavy gunny bags or corrugated boxes that require manual weigh-scale verification before acceptance.

Table 2: Stage-Wise Average Time Taken for Dispatch Operations (n = 30 Orders)

Dispatch Stage	Standard Benchmark Time (Mins)	Actual Average Time Taken (Mins)	Variance / Delay (Mins)	Primary Reason for Delay
Order Verification & Pick-List Print	10	15	+5	Delay in ERP order release from sales
Item Picking from Storage Bins	30	55	+25	Searching for scattered SKUs across racks
Packing, Labeling & Weighing	20	30	+10	Manual stencil/label writing
Invoice Generation & Vehicle Loading	15	25	+10	Single loading bay & e-Way bill generation
Total Dispatch Cycle Time	**75 Mins**	**125 Mins**	**+50 Mins**	**66.7% higher than benchmark**

Interpretation:

Table 2 indicates that the average dispatch turnaround time is 125 minutes against a target of 75 minutes. Item Picking from Storage Bins (+25 minutes) is the single biggest time-consuming activity, as fast-moving fasteners (such as M8, M10, and M12 hex bolts) are not stored close to the packing table.

Table 3: Nature of Dispatch & Receiving Errors Recorded (Last 6 Months — 450 Total Orders)

Error Category	Number of Incidents	Percentage (%)	Operational Impact
Quantity Mismatch (Short/Excess)	18	40.0%	Customer debit notes & re-shipment cost
Wrong Grade / Coating Supplied	11	24.4%	Rejection at customer QC gate

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Delayed Dispatch (Missed Cutoff)	10	22.2%	Loss of customer goodwill
Damaged / Rusted Packaging	6	13.4%	Return of goods & repacking labor
Total Errors Recorded	**45**	**100%**	**90% overall order accuracy**

Interpretation:
Out of 450 orders analyzed from secondary records, 45 orders (10%) experienced discrepancies. Quantity mismatch (40.0%) and wrong grade/coating supply (24.4%) together account for nearly two-thirds of all operational errors, largely due to similar-looking fastener sizes placed in adjacent bins without color-coded labels.

Figure 1: Organized Bin Storage System for Industrial Fasteners
To prevent grade mix-ups and reduce picking delays, industrial fasteners require clearly compartmentalized storage bins categorized by diameter, thread type, and material grade.



Figure 1: Compartmentalized Storage Racks at Harsha Industries

Figure 2: End-to-End Incoming and Outbound Dispatch Workflow
The operational workflow below illustrates how bottlenecks in sorting, inspection, and staging directly affect total warehouse lead time from inbound intake to outbound vehicle dispatch.

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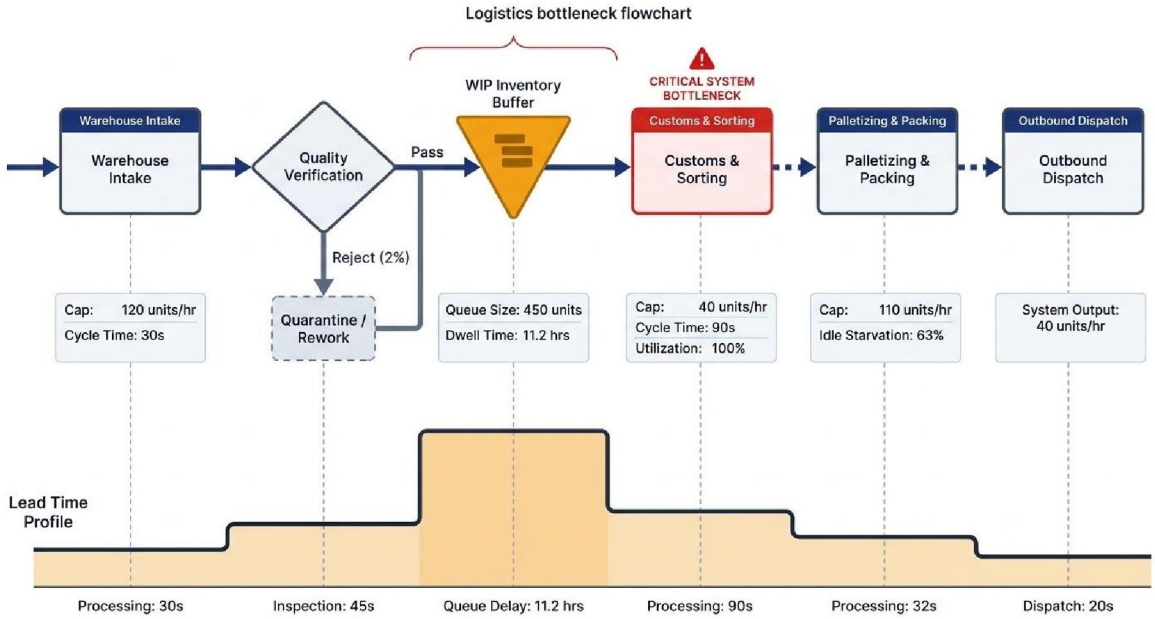


Figure 2: Warehouse Incoming and Dispatch Process Flow.

IX. FINDINGS

High Turnaround Delays: Incoming cycle time exceeds the benchmark by 50 minutes (71.4% delay), while dispatch cycle time exceeds the benchmark by 50 minutes (66.7% delay).

Bin Picking Bottleneck: Warehouse workers spend an average of 55 minutes per order searching for items due to non-scientific rack placement and lack of SKU location codes.

Weigh-Counting Inaccuracy: Relying on manual counting or uncalibrated platform scales causes 40% of total quantity mismatches.

Visual Confusion Between Grades: High-tensile (Grade 8.8 / 10.9) and mild-steel fasteners stored side-by-side without color coding lead to 24.4% wrong-grade dispatches.

Peak-Hour Dock Congestion: Over 65% of transport vehicles arrive between 3:00 PM and 6:00 PM, creating severe congestion at the single loading/unloading bay.

Suggestions

Implement ABC Slotting (Golden Zone Storage): Place fast-moving "Class A" fasteners (top 20% SKUs generating 80% of order volume) on waist-height racks nearest to the packing and dispatch bay to cut picking time by 40%.

Adopt Barcode Labels & Handheld Scanners: Generate QR/barcode stickers at the GRN stage for every box and bin. Scanning items during picking and packing will eliminate wrong-grade shipments.

Use Digital Piece-Counting Scales: Install calibrated high-precision digital piece-counting scales at both the receiving dock and packing table to speed up quantity verification.

Color-Coded Bin & Tag System: Introduce distinct color tags for different material grades (e.g., Blue for Grade 8.8, Yellow for Grade 10.9, Green for Stainless Steel) to prevent visual mix-ups.

Time-Slot Scheduling for Vendors & Transporters: Assign fixed morning time slots (9:00 AM – 1:00 PM) for incoming vendor deliveries and afternoon slots (2:00 PM – 6:00 PM) for outbound customer dispatches to avoid gate congestion.

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X. CONCLUSION

Efficient incoming and dispatch management is essential for maintaining profitability and customer trust in the industrial fastener business. At Harsha Industries Pvt. Ltd., the core products are high in quality, but operational delays during unloading, manual weigh-counting, scattered bin locations, and peak-hour dock congestion slow down overall throughput. By reorganizing warehouse racks using ABC analysis, introducing digital counting scales, applying color-coded grade labels, and scheduling vehicle slots, Harsha Industries Pvt. Ltd. can significantly reduce turnaround time, achieve near-100% dispatch accuracy, and strengthen its competitive position in the industrial supply chain.

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