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Evaluating Return Management and its Impact on Supply Chain Efficiency Towards Manufacturing Industry in Chennai

Ms. C.Logeshwari.B.Com.MBA.¹, Dr.M.Lavanya.M.B.A., M.Com.,M.Phil.,Ph.D.,²

¹Student, School of Management Studies, Sathyabama Institute of Science and Technology, Chennai, Tamilnadu, South India, Email: logeetha1234@gmail.com

²Associate Professor, School of Management Studies, Sathyabama Institute of Science and Technology, Chennai, Tamilnadu, South India, Email: lavanya3081@gmail.com

ABSTRACT:

In today's Fast-paced and sustainability-conscious world, managing product returns has become a vital part of supply chain strategy. This study dives into the real-world challenges and importance of return management, focusing on how businesses handle everything from returns and reverse logistics to bringing products back into circulation. We look at how smart return processes can boost both customer satisfaction and operational efficiency, all while supporting a more circular, eco-friendly economy. We break down key practices like inspecting returned items, restocking, refurbishing, recycling, or disposing of them. The study also explores the tools and strategies that make returns smoother—things like automation, good data systems, and collaboration across departments. By examining real industry examples across retail, manufacturing, and e-commerce, we highlight what works, what doesn't, and what companies can learn from each other. Our findings show that when companies take return management seriously, they not only cut costs and reduce waste but also build stronger relationships with customers. We also point out how technologies like data analytics and AI are changing the game—helping companies predict returns, fine-tune their processes, and shrink their environmental footprint. Overall, this research offers a practical roadmap for supply chain professionals who want to turn returns into a strategic advantage. It shows why return management shouldn't be treated as an afterthought, but rather as an essential part of a smarter, more sustainable supply chain.

Keywords: *Excess inventory, customer dissatisfaction, defective product, etc.*

INTRODUCTION

Return management in the manufacturing industry is all about handling products that customers, retailers, or distributors want to send back. Whether it's due to defects, dissatisfaction, or simply because the product didn't meet expectations, these returns form a crucial part of the supply chain. At first glance, returns might seem like a hassle or even a setback, but in reality, they present an opportunity to improve customer relationships, reduce waste, and boost overall efficiency.

In today's world, customers expect the convenience of easy returns, and manufacturers need to be prepared for that. It's no longer just about accepting returns; it's about managing them effectively. This includes handling the reverse flow of goods—ensuring that the returned products are processed quickly, efficiently, and with minimal cost. An efficient return process can help companies reduce unnecessary waste, recover valuable materials, or even refurbish products for resale, all while keeping customers happy.

In this competitive manufacturing world, getting products to customers efficiently is only half the battle. What happens when things don't go as planned—when products are returned due to defects, excess inventory, or customer dissatisfaction? This is where return management comes into play, a crucial yet often overlooked component of the supply chain. Return management isn't just about handling products that come back—it's about creating a smooth, cost-effective, and sustainable process that benefits both businesses and customers. As the manufacturing industry continues to evolve with new technologies, rising customer expectations, and increased environmental awareness, the way companies manage returns has become more important than ever. This study takes a closer look at how return management functions within the supply chain of the manufacturing sector. By exploring the challenges, strategies, and innovations in this area, we aim to uncover how manufacturers can turn returns from a logistical headache into a strategic advantage.

REVIEW OF LITERATURE:

Kumar and Saini (2021) highlighted something many manufacturers are starting to realize: returns don't have to be a burden. When managed well, they can actually give companies a competitive edge by boosting customer satisfaction and cutting down on unnecessary costs. Instead of seeing returns as just a problem to fix, businesses are beginning to treat them as a core part of their supply chain strategy. This shift has been made easier thanks to digital

advancements. Technologies like AI, machine learning, IoT, and blockchain are now playing a big role in making return processes faster, smarter, and more efficient. These tools help track products more accurately, assess their condition, and guide better decision-making throughout the return journey.

Jain and Raj (2022) discovered that when companies offer flexible return options, it can go a long way in building customer loyalty—especially in industries like electronics and automotive, where buyers often expect a smooth and hassle-free return experience. But while flexibility is great for customers, it can be tricky for manufacturers. If returns aren't handled properly, they can pile up, clog storage space, and create all sorts of logistical headaches. That's why many manufacturers are now turning to smarter solutions like centralized return hubs and automated inspection systems. These upgrades help make the return process quicker, more organized, and less costly in the long run.

Verma and Kumar (2021) pointed out that when companies embrace circular return strategies like reusing, refurbishing, or recycling returned products—they're not just helping the environment, they're also saving money. It's a win-win. This shift is becoming more common, partly because of stricter regulations, but also because today's consumers genuinely care about sustainability. People want to support brands that take responsibility for their products and the planet, and manufacturers are starting to respond to that expectation in meaningful ways.

Lee et al. (2023) highlighted how important teamwork has become when it comes to managing returns. Manufacturers, logistics providers, and retailers are now working more closely than ever to build return systems that are smooth, transparent, and connected from start to finish. By using shared data platforms and setting clear, consistent return procedures, they're able to cut down on delays and keep better track of products. This kind of collaboration is especially crucial in global operations, where returns can cross multiple borders and involve lots of different players. Without strong partnerships, things can quickly get messy.

Das and Mishra (2022) explored how having strong return policies and backup plans can really boost a company's ability to handle unexpected disruptions. Whether it's a sudden supply chain issue or a global crisis, businesses that stay ahead of the game and manage their returns proactively are in a much better position to adapt quickly and avoid major financial hits. It's all about being prepared, not just reacting when things go wrong.

OBJECTIVES OF THE STUDY:

1. To examine reasons for product returns, such as defective products, incorrect shipments, recalls, and customer dissatisfaction.
2. To evaluate how returns affect logistics, inventory management, and overall supply chain costs.
3. To investigate how digital solutions like automation, AI, and tracking systems enhance return handling.
4. To evaluate current return policies and their impact on customer retention and brand perception.

RESEARCH METHODOLOGY:

This study adopted a descriptive research design to effectively guide data collection. Primary data was gathered using structured questionnaires, which helped capture the responses of employees. A total of 107 respondents participated in the survey, all of whom were employees of the company and selected with a specific focus on their insights. The steps include describing problem, selecting variables to be used in the study, selecting the participant, collecting data and analyzing the findings of research. The inclusion criteria must be above 18 years of age. The survey is computer based Google form. To guarantee representation across several demographics, a stratified random sampling technique is used. The collected data was analyzed using percentage-based methods, visually represented through pie charts, along with statistical tests such as Chi-Square, conducted using SPSS software. The entire process was carried out systematically, with clearly defined, objective-driven questions.

DATA ANALYSIS

PERCENTAGE ANALYSIS

Table 1. Table indicating common reasons for return in manufacturing industry

PARTICULARS	FREQUENCY	PERCENTAGE
Defective products	79	73.8%
Customers dissatisfaction	28	25.2%

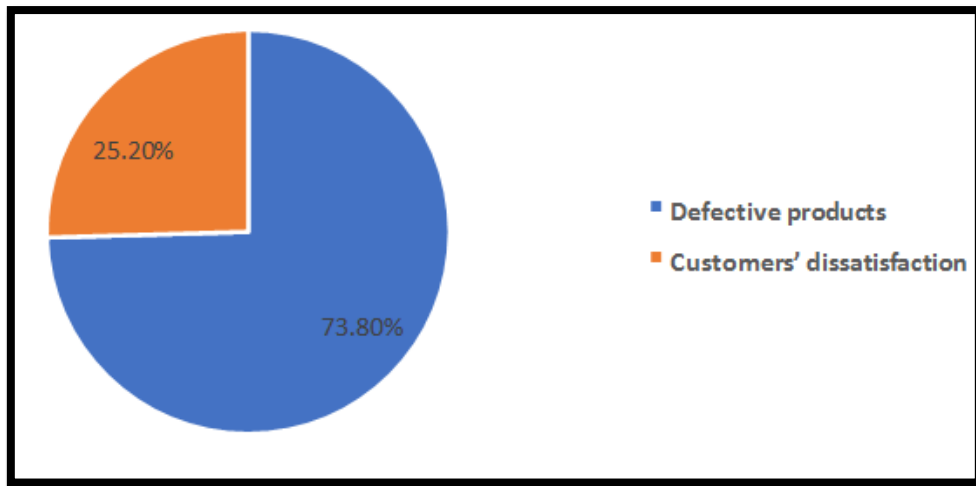


Figure 1. Figure representing common reasons for return in manufacturing industry

INFERENCE:

From the above table 73.8% of respondents accepted reason as defective products 25.2% accepted reason as customer dissatisfaction. This survey indicated that defective products are the most common reasons for returns.

Table 2. Table indicating Age of the respondents

PARTICULARS	FREQUENCY	PERCENTAGE
18-25	34	31.8%
26-30	61	57%
Above 30	12	11.2%
Total	107	100%

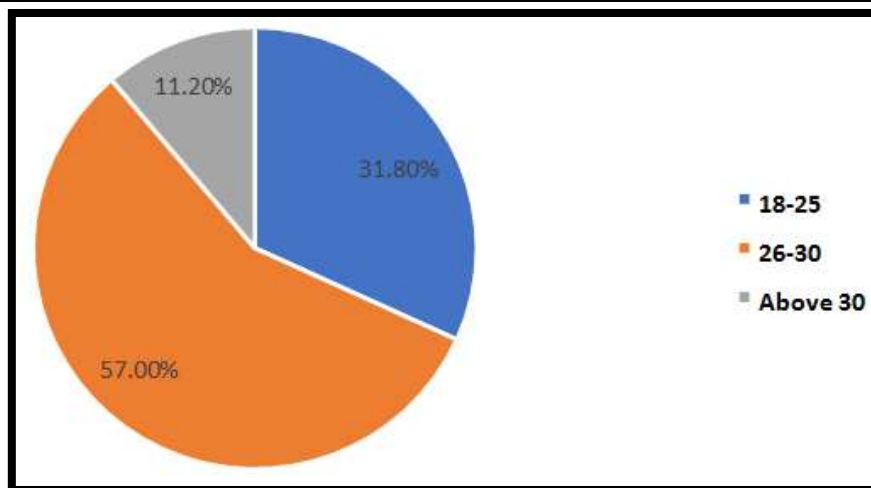


Figure 2. Figure representing Age of the respondents

INFERENCE:

From the above table it is inferred that 31.8% respondents are from age group of 18 to 25, 57% are from the age group of 26 to 30, 11.2% are from the group of above 30.

Table 3. Table indicating Gender of the respondents

PARTICULARS	FREQUENCY	PERCENTAGE
Male	73	68.2%
Female	34	31.8%
Total	107	100%

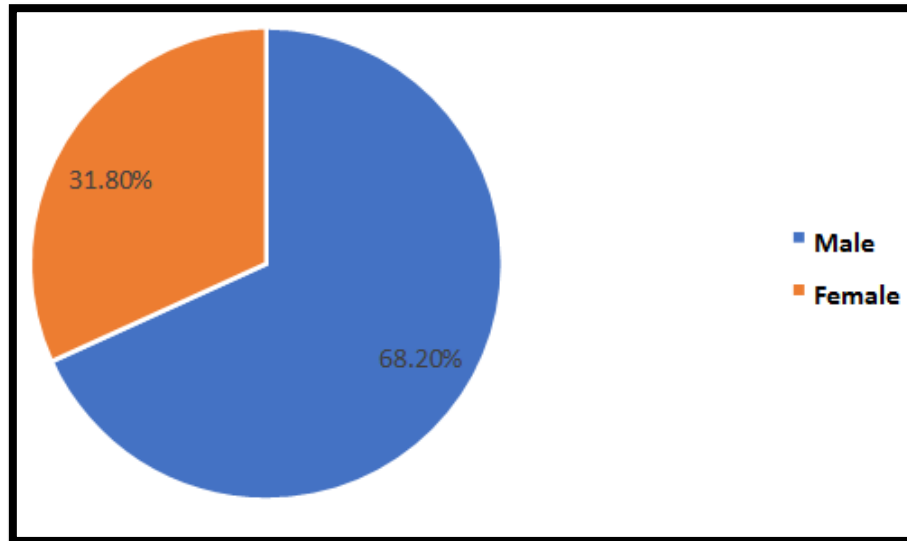


Figure 3. Figure representing Gender of the respondents

INFERENCE:

From the above table 68.2% are male and 31.8% are female respondents. It indicates that male respondents are highly participated in the survey.

Table 4. Table indicating Chi Square Test association between Age & Return Management

H_{01} : There is no association between Age & Gender and the reason for returning the product.

H_{11} : There is a association between Age & Gender and the reason for returning the product.

			Cases			
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
REASONS AGE	107	100.0 %	0	.0%	107	100.0 %

Chi-Square Tests

	Value	Df.	Asymp. sig. (2 – sided)
Pearson Chi-Square	7.011(a)	2	.030
Likelihood Ratio	6.967	2	.031
Linear-by-Linear Association	2.199	1	.138
N of Valid Cases	107		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 4.45.

Table 5. Table indicating Chi Square Test association between Gender & Return Management**Case Processing Summary**

			Cases			
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
REASONS * GENDER	107	100.0 %	0	.0%	107	100.0%

Chi-Square Tests

	Value	Df.	Asymp. Sig. (2 sided)	Exact Sig. (2 sided)	Exact Sig. (1 Sided)
Pearson Chi-Square	2.148(b)	1	.143	.162	.110
Correction(a)	1.512	1	.219		
Likelihood Ratio	2.084	1	.149		
Fisher's Exact Test					
Linear-by-Linear Association	2.128	1	.145		
N of Valid Cases	107				

a. Computed only for a 2x2 table b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.90.

INTERPRETATION:

After analyzing the data, we found that gender doesn't have a significant impact on why customers return products. Whether the customer is male or female, the reason for returning—whether it's a defective product or dissatisfaction—is pretty much the same. The statistical test (p-value = 0.143) shows there's no strong link between gender and return reasons.

INFERENCE:

$p = 0.143 > 0.05$, we fail to reject the null hypothesis. This means there is no significant association between gender and reason for return.

SUGGESTIONS:

- Sort returned items by condition to decide what can be resold, repaired, or scrapped.
- Use return trends to better plan logistics and avoid surprises.
- Keep track of why products are returned to spot common issues like defects or wrong items.
- Look into return patterns to fix problems at the source—whether it's in packing, shipping, or the product itself.
- Double-check quality before shipping to avoid sending out faulty or incorrect items.

CONCLUSION:

Return management is no longer just about handling unwanted products it's a key part of building a smarter, more efficient, and more sustainable supply chain. When done right, it helps businesses save money, keep customers happy, and reduce waste. This study shows that with the right systems, technology, and mindset, returns can shift from being a headache to a real opportunity. Moving forward, companies that prioritize return management as part of their overall strategy will be better equipped to compete, adapt, and grow in today's changing market.

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Author Contribution

Ms. C.Logeshwari designed the study, conducted data collection and theoretical framework and prepared the manuscript. *Dr.M.Lavanya* provided guidance on research design and methodology and contributed to critical revisions and final approval of the manuscript.

Conflict of Interest

The authors declare no conflict of interest in the publication of this research.

Ethics Approval

The study involves voluntary participation by respondents through informed consent.

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