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CHALLENGES AND OPPORTUNITIES IN REVERSE LOGISTICS: MANAGING PRODUCT RETURNS IN THAILAND

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ABSTRACT

This research article is based on the "Challenges and Opportunities in Reverse Logistics: Managing Product Returns in Thailand". The Thailand economic growth is driven by the export, electronic goods and services and playing significant role in economic mobility and domestic development. The effective reverse logistics management is a crucial for reducing costs factors and maintaining services quality in Thailand. In this research the researcher focused on the key aspects of clear policy makers, efficient return policy and cost-effective procedures, waste disposal which enhance service quality. This research study analyzed the difficulties and potential solutions in reverse logistics, enhancing technical experts and modern trends. The researcher also emphasized the key challenges and opportunities to handle the reverse process intelligently and in a more efficient way with technical help. The key challenges includes, fluctuating return policy inspections of return goods, optimizing stock levels, unpredictable reason for return and processing return for customers satisfaction. The process of logistics return is important and challenging in Thailand such as damage, inventory changes, restocking, salvage, recall and excess stocks. The many of industries in Thailand adapted to manage the reverse logistics will help manufacturers associated with return volumes and product diversity. This process amplified the significance of reverse logistics, with global return reaching a trillion dollars annually. To address these issues the researcher analyzed the challenges, potential solutions, including the adoption of advanced identifications systems and further development of technology such as IoT, block chain and AI.

KEYWORDS: Reverse Logistics, Recycling, Green Supply Chain, IoT AMS Classification: 90B06- Logistics Management.

1. INTRODUCTION

Reverse logistic management is the process to takeback the products from the customers and initiate the returning and exchanging process. In Thailand the reverse logistics management manage the process very intelligently and more efficient way. The researcher emphasized the analysis of challenges and potentials of reverse logistics. The potential of reverse logistics is the process to take back the goods and products in a more efficient way with the help of technological solutions. The researcher identified the issues and challenges which are facing by logistics management in production and manufacturing industries. (Saleh, 2011) stated the e-commerce product return rate – statistics and trends, inverse organization which are more significant in current situation in Thailand, day by day the exchange rate of increasing due to heavy demand of the products and services.

NChannel (2017) identified the problems and challenges of online traders which are improving their services with the help of technological help. The production and manufacturing industries have more options to exchange the products in case damage or wrong product deliver to customers' address. American Express (2021) stated that the multiple choices and frequently changes requirement of customers, in some cases the customers changes the products because of that they did not decide at the time ordering. Because of the flexibility of e-commerce and return options for the customers frequently changes their requirements. In case of damage that is a genuine reason to exchange the products or items with the customers.

Tibben-Lembke(2001) stated that the reverse logistics practices in reverse logistics management, this is very old study where e-commerce was very poor in service and reverse logistics. Now the current reverse process in Thailand to provide the flexible way to manage the reverse logistics process and easy way to return the products and items. Shear, H.W(2002) emphasized the happy products and return process were the biggest issues in product and manufacturing industries. The researcher identifies the key aspect of reverse logistics management in Thailand to simulate the reverse logistics process in more efficient manners. Farris, M.T(1992) stated that reverse logistics in plastics recycling which as more relevant and reliable for the production and manufacturing industries, the plastics and reusable products can be recycled in production and manufacturing industries in Thailand.

Thailand Pollution Report 2011; Pollution Control Department: Bangkok, this research report identifies the key issues of reverse logistics challenges and opportunity to control the business process in more efficient manners. The pollution control department found the key issues of reverse logistics and management process is playing a significant to role to increase the pollution rate in Thailand. Achapan(2012) identifies the behaviors of customer who are often returning the product and items in Thailand. In this study the researcher identifies the habitual behaviors in case of recycling of product in case of damage and broken. This is the real scenario in online marketing, while packing the transport the products can be damaged, and the industry has to take responsibility for the entire things.

2. LITERATURE REVIEW

The Thai Pulp and Paper Industries Association (2013) identified the key issues of reverse logistics process in production and manufacturing industries. The research team identify the key factors which are responsible for reverse logistics such as, in case of damaged product, delivered wrong products, sometimes, size issues and many other others which leads to play a significant role in reverse logistics. Wilson, D.Cet.al. (2006) identified the Corresponding waste management in development countries which significantly come from the reverse logistics process. The researcher emphasized the key factors of waste management and recycling which would benefit the future developing the product and items which would be reused for further application. Stock, J.R(1992) emphasized the key features which makes the biggest barriers with respect to council of reverse logistics management and techniques to handle the critical situation if the reverse of logistics initiated in return mode.

Fleischmann, M et.al.(2000) characterization of logistics networks for product recovery in case of reverse logistics processes are initiated in case of damage or wrongly delivered product. The most of cases are found that the reverse logistics would be initiated in case of wrongly product or damage is delivered. The researcher also identified the issues and challenges which are facing by the production and manufacturing industries. Thierry, M.C et.al. (2021) proposed the new Strategic issues in product recovery management in case of reverse logistics process are initiated or customer apply for reverse

logistics products. In this research study the researcher identify the significant research issues and challenges which are directly associated to reverse logistics process to exchange the product and return in case of damage and wrong products given to customers.

De Brito, M.P(2002) developed a framework to identify the key attributed of reverse logistics. During this research study the researcher tried to find out the reason behind reverse logistics. The researcher identified that customer satisfaction and their choice rapidly changes during the online process, it plays a significant role in simulating the entire process to initiate reverse logistics process. Presley(2007) defined the theory and practice of reverse logistics in the real world to handle the situation in a more efficient way in case of reverse logistics initiated. The current scenario is the production and manufacturing industries using Internet of Things (IoT) to identifydefective products and items which is not reliable for purchase.

Louwers, D et.al. (1999) emphasized the reused carpet waste management in Thailand. The researcher identified the key reason behind the reason for reverse logistic process to reuse the unused goods and products in case of damage and recycle into a new product that would again come into the market for sale. Mermaid 2008)stated that recycling and reuse of household plastics can be reused to design and restrict the new product and item. The researcher identified the significant research issues in the process reverse logistics and challenges. Some researcher developed a programming approach for plastic recycling in Thailand W. A(2019).

S.K. Srivastava (2020) proposed a green supply chain management for reverse logistics process for returning the products and items. The researcher identified the green supply chain management process to handle the reverse logistic process in more efficient and technological manners. The green supply chain management process is based on smart transport and smart reverse logistics process using Internet of Things (IoT). M.W. Toffel 2022) proposed strategic management of product recovery in case of reverse logistics process is initiated to return the product to the company. M. Mannella (2021) emphasized the reverse logistic process and its techniques for the company or mega marts to minimize the damage product and exchange rate of customers. From the customer's point of view the products can change in multiple conditions, in case of damage, not finalized, poor quality of product, used products and customer satisfaction.

D.S. Rogers (2020) focused on reverse logistics practices in production and manufacturing industries, the industries has to make a business policy the damage and wrong product should not be delivered to any customers, which is not possible in real life, but we can minimize. S. Zailani (2021) identify the mediating effects of product returns on the relationship between green capabilities and closed-loop supply chain adoption to enhance the services of reverse logistics management process with the technological supports. During the research study the researcher found that technology is playing a significant role in managing the reverse logistics process with more efficient ways to enhance returning and exchanging the products.

Y. Luo(2022) identifies the advantages of value creation in case of reverse logistics process initiated. The company goodwill and commitment in case of returning and exchanging the products or refunding money to customer in their account. The researcher also identifies the key issues if the product is based on the third party or any other association with products. M. Alkahtani et.al. (2022) proposed insight into reverse logistics with a focus on collection systems to handle the reverse process of products in more efficient ways. The researcher found that the current method is not suitable to handle the reverse logistics process, the current process is not able to handle the situation in case false return generated by customers.

E. Sundin (2023) stated the reverse logistic transportation and packaging concepts in automotive remanufacturing is the challenging process for production and manufacturing industries. The researcher identifies the challenging process in reverse logistics process in case if the customer wrongly selected products or particular item, and instant of the moment they change their mindset to change the product and want to purchase other products. K.C. Tan (2024) identify the biggest barriers to product returns and recovery management in a developing country: Investigation using multiple methods. The researcher used the machine learning approach to identify the defective products which are delivered to customers, or it is mismatched to customer ordered. This process that would be minimizes the reverse logistics process in Thailand.

K. Saleh(2022) emphasized the return rate of product from the customers in manufacturing industries and try to find out return rate of products

or items which are applied by the customer to exchange or return in any cases. The researcher analyzed the statistical process to collect the returning product data and its compliances how rapidly the customers are using the reverse logistics process in Thailand. As we know that Thailand is tourist place to attract the customer in place of any shopping difficulties to damage their business control.

2.1. The Reverse Logistics Process

The reverse logistics process starts the movement of goods and services at least one step forward and backward from the traditional supply chain. The multiple processes which includes products manufacturing in industries, move to warehouse and mega-marts for final selling process as per needs and requirement of the demand of operation management. The online shopping process, the customer ordered online without knowing that in case of exchange and returning how the product prices would be affected in future.

Figure 1: Reverse Logistics Process

The beverage industries are more concerned about their products' expiry date and commitment to customers and companies. It is more specific about reusing in case of damage or loss of products during transportation, rapidly changing customer's requirement. Many industries have its own rules and regulations to change the product policy and refund would be initiated in more efficient manners. The reverse logistics is responsible for the return packaging materials and pallets. The industries also grasp the managing rejected products (Figure 1).

3. CHALLENGES AND OPPORTUNITIES IN REVERSE LOGISTICS

3.1. Managing Complexity and Variability

The challenges and opportunities to replace or recycle is the complex and variability of handling different products and items, The researcher identifies the consistent and predictable flow to handle the reverse logistics process in more efficient way using machine learning approach. In case of unpredictable cases, it is very difficult to trace out customer satisfaction and interest.

3.2. High Costs of Processing Returns

The reverse logistics process is a high cost which would have to bear the organization or enterprises. In case of replacement or exchange by the customer there would be additional costs for the company including pick cost, sorting, re-packaging and re-transporting to at customer address with additional postal changes. All these activities involve the labor cost, efforts and other costs which is highly significantly affected on company benefits.

3.3. Lack of Specialized Expertise

In reverse logistics management there is a lack of expertise in handling cases such as recycling, returning products, exchanging, damage and other problems, and wrong orders by the customers. This is a crucial process for supply chain management to pick up and deliver to the same address. The lack of expertise would be suffering a lot to handle the reverse logistics process, strategic planning, and training to handle the successfully reverse logistics process in more efficient ways.

3.4. Best Practices for Successful Reverse Logistics

Best practices if the solution of all possible in real world. In case of reverse logistics number of process

will start from the end to start from warehouse. There is some specialized software process to help the reverse logistics to streamline and gain better visibility into your reverse supply chain management process.

3.5. Regulatory Compliance and Environmental Impact

Navigating the regulatory landscape and managing environmental impacts are significant challenges in reverse logistics. Companies must comply with various regulations related to the disposal of hazardous materials, recycling, and waste management. Failure to adhere to these regulations can result in legal penalties and harm to the company's reputation. Moreover, managing the environmental impact of returns through sustainable practices is essential for meeting consumer and regulatory expectations.

3.6. Data Management and Analytics

Data management and business analytics is technological tools to analyzed how rapidly returning rate is occurring in companies and mega-marts and what is reason behind them. Business analytics help the reverse logistics process to make an intelligent decision to reduce the return rate. Implementing robust data management systems and leveraging analytics tools can provide valuable insights and drive continuous improvement in reverse logistics operations.

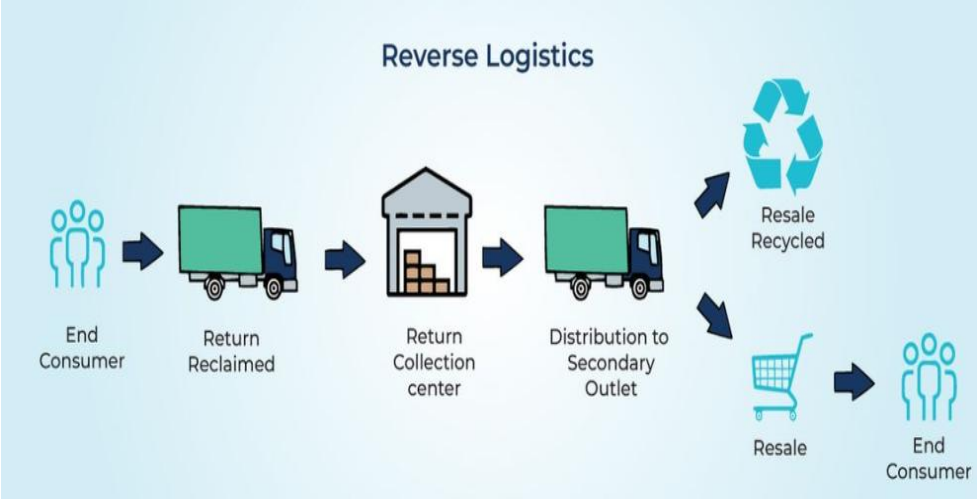


Figure 2: Reverse Logistics Process

The reverse logistics process started from the customer dis- satisfaction, in case of damage or changing the requirement, the customer can claim and responsibilities to handover to claim department and products send to warehouse. The researcher focused on the key aspect of reverse logistics process and management services to handle the defective and damage products in more efficient manners, in those situations the companies offering the exchange offers without shipping charges. In some cases of conventional logistics come into the picture but in reverse process (Figure 2).

4. RESEARCH ISSUES

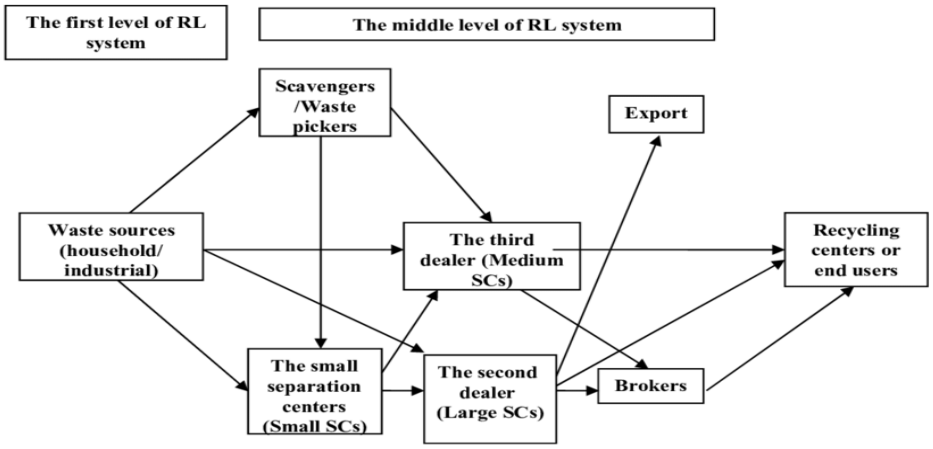
Overconsumption of resources has emerged as a pressing global issue, necessitating strategies to address resource depletion and mitigate related crises. The circular economy (CE) has been proposed as a promising approach to tackle these challenges. As the complexity of supply chains continues to increase, traditional performance metrics for CE are becoming insufficient. This underscores the need for new or refined performance measures to effectively manage CE initiatives. Block chain technology, with its potential to enhance transparency and traceability, may play a pivotal role in advancing CE. This chapter explores the intersection of block chain technology and CE, particularly focusing on performance measurement in reverse logistics activities. Notably, both block chain and CE performance metrics, especially those related to reverse logistics—are still evolving in both theoretical frameworks and practical applications (Kouhizadeh, M. et al., 2022).

Autry, C.W. (2001) highlights the growing importance that firms are placing on managing returned products. Reverse logistics programs are increasingly being utilized to recover assets that would otherwise be lost. Research in this area, particularly within the electronics industry and among catalog-based sales firms, reveals mixed results. Performance in reverse logistics is significantly influenced by sales volume, while satisfaction with reverse logistics services is

impacted by industry factors. However, the location of responsibility for disposition does not affect either performance or satisfaction.

In response to rising environmental and sustainability concerns driven by legislation and public awareness, companies are reevaluating their supply chain strategies to better manage reverse product flows. This shift has resulted in a significant increase in scholarly publications on the subject. The study identifies research gaps and suggests future research opportunities, offering a roadmap for managers seeking to align forward and reverse supply chains for comprehensive growth and development. The review provides valuable insights for researchers and practitioners in the field of RSC, highlighting areas that have been well-explored and those requiring further investigation (Mathiyazhagan et al., 2021).

4.1. Case Study: Computer Parts Study in Thailand



Adapted: DOI:10.3390/su6107048

Figure 3: The Process of Reverse Logistics in Thailand (Pumpinyo, Sumalee &Nitivattananon, Vilas. (2014).

Sirisawat, P. (2016) proposed a case study on five manufacturers in computer parts Industries in Thaland to apply the green concept in supply chain management in reverse logistics process to simulate all possible operation between customer to company. The researcher also focused on the environmental issues which are playing a significant role in government concern and developing environmental regulations. The main objective of this research study to explore current process and activities of green [42-50] procurement management in the computer parts Industries in Thailand. The researcher proposed the resultsof the research study that help to understand the green procurement management system and reverse logistics process in Thailand (Figure 3).

Pumpinyo, Sumalee &Nitivattananon, Vilas. (2014) proposed a research study on reverse logistics process end the products in case of damage [51] or defective products, by mistake it is delivered wrong product to wrong customers. This situation is very painful for the company or enterprises. The above framework of this study to control the entire business in case reverses logistics in Thailand. The reverse process started with the customers and handover to company with proper reason. The Thailand is the capital of customers or tourist, in case if neither it nor proper handle that situation would be very difficult and affected the huge loss of his economic [52]. In current scenario reverse logistics process using the green supply chain management policy with the help of technology such as Internet of Things (IoT) to change the dimension of reverse logistics process [53-55].

In this research study the research found that customer satisfaction is more important than the company loss. During this research study the researcher identifies the number of factors which are significant playing a role in reverse logistics such as changing demand of customer, requirement parameter changed, defective product, and poor quality of product, not as expected.

5. FUTURE RESEARCH STUDY

Reverse logistics is one of the challenging research areas toidentify the biggest barriers and technological help to simulate the entire process where customer loyalty and company benefits are involved. The researcher reviewed the number of research article on reverse logistics which high significant in Thailand for production and manufacturing industries. The researcher stated that some of the future research areas where further study can be applied.

1. To simulate the reverse logistics process there is a significant role in technologies to control entire operations, Internet of Things (IoT), block chain technology, advanced business analytics, robotics, and relocation technology.
2. Proper way to efficient waste management and recycling in case of plastics product or items.
3. Investigation of the barriers and factors which are directly affectedby reversing logistics process.

6. SUMMARY AND CONCLUSION

Finally, the researcher concluded that reverse logistics generally incurs higher costs compared to conventional logistics due to the complexity and variability of return processes. Key challenges include managing fluctuating return volumes, ensuring thorough inspection of returned goods, optimizing stock levels given the unpredictable nature of returns, and processing returns swiftly to maintain customer satisfaction.This process is essential for handling returns due to damage, seasonal inventory changes, restocking, salvage, recalls, or excess stock. It facilitates the movement of returns from consumers back to manufacturers, aligning with recovery schedules. Although reverse logistics can lead to higher costs due to increased return volumes compared to forward distribution. Manufacturers should focus on improving return processes, establishing effective organizational structures, and employing performance measurement techniques to control costs. These strategies will help manufacturers achieve sustainable transportation processes and manage the uncertainties associated with return volumes and product diversity

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