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A STUDY ON CHALLENGES FACED IN IMPORTING CMRL TRACK

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Abstract: The importation of track components for the Chennai Metro Rail Limited (CMRL) system presents a complex array of challenges that impact project timelines, costs, and quality. This study aims to identify and analyze the key obstacles encountered in the import process of CMRL track materials, including logistical constraints, regulatory compliance issues, customs delays, currency fluctuations, and supplier-related problems. By conducting a detailed review of procurement documents, interviews with logistics and procurement professionals, and case analyses of past import activities, this research highlights the root causes of delays and inefficiencies. The findings suggest that improved coordination among stakeholders, adoption of digital tracking systems, and strategic sourcing policies can significantly mitigate import-related risks. This study contributes valuable insights for infrastructure project managers and policymakers involved in large-scale rail transport systems, helping streamline future procurement and importation processes for metro rail projects.

Keywords: Break Bulk Cargo, CMRL Tracks, Freight Forwarders, Cargo Handling

I. INTRODUCTION

The term "breakbulk" describes goods that is conveyed in separate parts rather than in bulk or in containers. Usually, this kind of cargo consists of big, heavy, or asymmetrical objects like construction materials, steel, machinery, or automobiles. Using cranes or other specialized equipment, breakbulk items are frequently lifted straight onto ships or other transport vehicles because they cannot be placed into regular shipping containers. Compared to containerized items, breakbulk freight requires more time and effort to handle and transport because each item needs to be carefully loaded, secured, and unloaded independently. Transporting extremely enormous, heavy, or oddly shaped objects is known as project cargo. These are not your normal consumer goods; rather, they are frequently large pieces of machinery, equipment, or parts required for large-scale operations. It could be massive mining machinery, bridge construction equipment, or equipment for a power plant, for instance. Project cargo requires far more preparation and specific treatment than typical shipment, when goods fit into standard containers. They may require special transport vehicles, big cranes, or ships with customized decks to accommodate these large objects because they may not fit into standard shipping containers. The actual transportation is more difficult. You must identify routes that can accommodate enormous loads because you cannot simply put huge things on any ship, plane, or road. To sustain the weight of the goods, roads may occasionally need to be modified, or bridges strengthened.

The Chennai Metro Rail system is constructed on 1435 mm (4 ft 8.5 in) wide standard gauge tracks. Metro systems all around the world use standard gauge because of its benefits in terms of stability, efficiency, and lower maintenance cost. Urban rapid transit systems, or metro rails, are usually defined by trains that travel on specially constructed tracks, either elevated or subterranean, in crowded cities. Within urban regions, these systems are made to effectively move a lot of people over short to medium distances. In addition to lowering pollution and traffic congestion, metro rail systems are designed to offer a quicker and more dependable option to other urban transportation options like cars or buses. Metro rails are a type of fast transportation system made to effectively transport lots of people inside cities. The tracks on which these systems run can be elevated (sky trains), subterranean (subways), or at ground level. Since they run mostly on electricity, they are an eco-friendlier mode of transportation than cars and buses. Metro train systems offer a practical means of getting around crowded cities because of their high regularity, dependability, and speed. Metro Rail's primary advantage is its capacity to ease traffic jams and offer a dependable, quick mode of transit, particularly during rush hours. By providing a dedicated, unbroken path that is less impacted by traffic or bad weather, they contribute to increased

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urban mobility. The ability of metro systems to swiftly move huge numbers of people is crucial for meeting the transportation demands of expanding metropolitan populations.

The reduction of private automobiles on the road, which lowers air pollution and greenhouse gas emissions, is another way that metro systems support environmental sustainability. Several contemporary metro systems use renewable energy sources, and many are built with energy efficiency in mind. The Delhi Metro, Tokyo Metro, London Underground, and New York City Subway are important instances of metro systems. In order to lessen traffic and enhance the standard of living in cities, these systems are essential parts of the public transit systems in those cities.

1.1 PROBLEM OF THE STUDY

The successful implementation of metro rail infrastructure projects, such as those undertaken by CMRL, is highly dependent on the timely and efficient procurement of essential components like rail tracks. However, the process of importing these specialized tracks from international suppliers often encounters multiple challenges, including bureaucratic delays, customs procedures, fluctuations in foreign exchange rates, logistical bottlenecks, and compliance with technical and quality standards. These issues can result in project delays, cost overruns, and operational inefficiencies. Despite the critical importance of smooth track importation, there is limited empirical research analyzing the specific obstacles faced in this domain. This study aims to bridge that gap by identifying and examining the key challenges in importing CMRL tracks, thereby contributing to more effective planning and risk mitigation in future infrastructure projects.

1.2 NEED FOR THE STUDY

- To ensure timely import of metro track components crucial for CMRL's ongoing and upcoming infrastructure projects.
- To identify and analyze logistical challenges that cause delays and cost escalations.
- To study the role of customs procedures and documentation accuracy in avoiding shipment hold-ups.
- To highlight the importance of regulatory compliance in international shipping and its effect on delivery schedules.
- To support CMRL in developing better logistics planning and risk mitigation strategies.

1.3 OBJECTIVE OF THE STUDY

Primary Objective

- To analyze the logistics procedures involved in importing metro tracks, including handling, transportation, and storage.

Secondary Objective

- To identify the key challenges encountered during the importation of metro track components for CMRL (Chennai Metro Rail Limited).
- To study the impact of documentation errors, regulatory compliance, and shipping regulations on timely delivery.
- To identify delays and bottlenecks in international shipping routes and customs clearance affecting CMRL imports.
- To assess the efficiency and feasibility of different shipping methods and port operations for breakbulk cargo.

1.4 SCOPE OF THE STUDY

- This study covers the import process of metro track components specifically for Chennai Metro Rail Limited (CMRL).
- It includes all logistics procedures handling, transportation, storage, and documentation.
- This study analyzes the challenges faced during customs clearance and regulatory checks.
- The scope of the study extends to international shipping routes and their impact on timely imports.
- Its Focuses on identifying bottlenecks and suggesting improvements in import logistics.

II. LITERATURE REVIEW

- **May Thu Thu Khine(2022):** The study primarily concentrates on the challenges faced by logistics service providers in the Yangon Region with respect to maritime imports. Structured questions are employed to acquire primary data from 260 logistics service providers in Yangon, out of a total of 743 logistics service providers. The investigation reveals that there are infrastructural bottlenecks, including physical transportation restrictions and a shortage of container vehicles for imports. Furthermore, the sea import logistics industry in Yangon undergoes an absence of an efficient technical system. Government policies and regulations are inadequate to sustain the logistics sector, according to the

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investigation. Additionally, there is a scarcity of skilled labor in the logistics industry, which presents obstacles to the recruitment and retention of qualified personnel.

- **K. Tamizh jyothi (2022):** Clearing and forwarding agents are facing lots of problems which have direct impact in their business performance. Though, the problems are more in every field, but in C&F agents, they totally depend on customers, customs and shipping companies. The problems faced by them are grouped into four categories namely, finance problems, logistics problems, problems related to government policies, and customs problems. This industry runs mainly of logistics related activities and hence, they face several problems related to logistics. Of course, finance problems are major issues in any company, and this industry is not an exemption. Clearing and forwarding agents are facing lots of problems in their day to day activities. Competition persists everywhere in the logistics and shipping industry.

- **Melkamu Tamrie Temesgen. (2021):** The general objective of this study is to assess the opportunities and challenges of import substitution in Ethiopia. More specifically, the study has tried to achieve the following specific objectives: to review the different policies, rules and regulations that are undertaken to stimulate import, to appraise the implementation of import substitution and its effectiveness, to describe the economic benefit of import substitution to the economy and to determine the role of manufacturing sector in relation to facilitating import substitution. Descriptive research design was used because it helps to answer the research question and assess, identify, and describe the problem at hand. The study also adopted mixed research approach which includes qualitative and quantitative research approaches to obtain the desired results of the study. The target population of the study is exporters, manufacturers, and government (public) workers.

- **Constantine S. Katsikeas (2020):** "Regulatory Frameworks in Break Bulk Logistics: Compliance and Challenges"**.** They examine how regulatory and policy frameworks influence break bulk logistics. Their study highlights the challenges posed by inconsistent customs regulations across different countries, delays caused by excessive documentation requirements, and the necessity of standardized international procedures to guarantee compliance while reducing bureaucratic inefficiencies.

- **Alfahd, Osamaabdulhakeem Hezam (2019):** "Sustainable Break Bulk Shipping: Environmental Challenges and Solutions". They explores the effects of break bulk shipment on the environment, paying special attention to carbon emissions and fuel use. The authors discuss how the adoption of eco-friendly port operations, cleaner fuel alternatives, and sustainable cargo handling practices can reduce the environmental footprint of break bulk logistics. They also highlight legislative efforts and regulatory pressures that promote the use of environmentally friendly shipping methods.

- **Deepa Rajesh, Sandeep Kumar Gupta (2018):** "This research was undertaken with the sole aim of understanding some of the challenges and Factor Influencing the Freight Forwarding Business in the organizations involved the Forwarding and distribution of shipper Cargo encounter in their logistics operations. A freight forwarder is a person or company that organizes shipments for individuals or corporations to get large orders from the manufacturer or producer to market or final point of distribution. Forwarders will contract with a carrier to facilitate the movement of goods. A forwarder is not typically a carrier but is an expert in supply chain management. In other words, a freight forwarder is a "travel agent," for the cargo industry, or a third-party (non-asset-based) logistics provider. A forwarder will contract with asset-based carriers to move cargo ranging from raw agricultural products to manufactured goods. The term Logistics Management or supply chain management is that part of Supply Chain Management that plans, implements, and controls the efficient, effective, forward, and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer's requirement.

III. RESEARCH METHODOLOGY

Research methodology is the methodical approach used in a research study to collect, analyze, and interpret data in a structured and scientific manner. It entails establishing research problems, developing hypotheses, picking a good research design, and figuring out how best to gather and analyze data. Selecting a sample strategy, guaranteeing the authenticity and reliability of the data, and resolving ethical issues like informed permission and confidentiality are further components of the process. A clearly established research technique guarantees the study's objectivity, reliability, and reproducibility. It assists researchers in solving difficult problems, coming to well-informed conclusions, and adding significant information to their disciplines. Methodologies may be qualitative, quantitative, or a mix of the two, depending on the type of study. For any research project to be successful and produce accurate data, a solid technique is essential.

3.1 Research Design

Descriptive Research Design

Descriptive research design is a systematic method for collecting, analyzing, and presenting information about a specific phenomenon, group, or situation. It aims to provide a thorough understanding of a subject by answering questions like

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"what," "who," "where," "when," and "how." It is commonly used in social sciences, business, healthcare, and market research to investigate habits, trends, and traits.

3.2 Sampling Techniques

Purposive Sampling

Purposive sampling is a non-probability sampling technique where researchers deliberately choose participants based on predetermined standards like experience, knowledge, or study relevance.

Sample Area

Freight forwarding, Chennai.

Sample Size

45 samples from freight forwarding.

3.3 Method of Data Collection

Primary Data

Primary data is information that has been collected directly from the source for a specific purpose.. It is obtained using techniques like surveys, interviews, experiments, and firsthand observations. Since original data is gathered directly from the source, it is typically accurate, current, and pertinent to the goals of the researcher. However, because acquiring primary data necessitates enough preparation, resources, and effort, it can be expensive and time-consuming. Primary data offers insightful information, but there are drawbacks to take into account, including biased responses, trouble reaching a large sample, and high expenses. Primary data is frequently used by organizations, researchers, and businesses to make well-informed decisions.

Secondary Data

Secondary data is information that has already been collected and published by others. Research papers, periodicals, corporate records, government reports, and internet databases are some of the sources from which it is gathered. When primary data collecting is impractical or unneeded, secondary data is frequently employed since it saves money and time. Its precision is dependent on the validity of the original source, though, and it might not always be tailored to the researcher's requirements. Companies frequently use secondary data for market research, such as examining historical sales data to forecast future demand or relying on public reports to analyze industry trends. Before using secondary data to inform decisions, researchers should confirm its validity and applicability, even though it can be helpful for comprehending broad trends and historical Insights.

IV. ANALYSIS & INTERPRETATION

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
What is the most frequently reported issue in importing metro track components?	45	1	4	2.24	1.048
Which documentation error is most commonly encountered during metro track imports?	45	1	4	2.38	.960
What is the biggest challenge in using breakbulk method for metro track transport?	45	1	4	2.24	1.026
What are the common reasons for delays during customs clearance at Indian ports?	45	1	4	2.29	.968
How does the lack of proper communication between the supplier and logistics partners affect the import process of CMRL tracks?	45	1	4	2.69	1.221
Valid N (listwise)	45				

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INFERENCE:

The data shows that issues in importing metro track components are generally consistent, with mean scores ranging from **2.24 to 2.69**. The most significant challenge is the lack of proper communication between suppliers and logistics partners (**mean = 2.69**), while other issues, such as documentation errors and customs delays, are similarly important but slightly less critical.

Correlations

		Which mode of transportation is primarily used for importing metro tracks for CMRL	What solutions can improve last-mile delivery of imported tracks to construction sites
Which mode of transportation is primarily used for importing metro tracks for CMRL	Pearson Correlation	1	.094
	Sig. (2-tailed)		.539
	N	45	45
What solutions can improve last-mile delivery of imported tracks to construction sites	Pearson Correlation	.094	1
	Sig. (2-tailed)	.539	
	N	45	45

INFERENCE:

If the data shows a correlation of **0.094** with a **significance of 0.539**, this suggests a **very weak and non-significant relationship** between the variables. In other words, there is little to no correlation, and the relationship is not statistically significant (since the p-value is higher than 0.05).

ANOVA

What is the average delay time in customs clearance at Chennai port

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.714	3	.238	.255	.857
Within Groups	38.264	41	.933		
Total	38.978	44			

INFERENCE:

The ANOVA results show no significant difference in average customs clearance delay times at Chennai port ($F = 0.255$, $p = 0.857$), indicating that delay times are consistent across the groups.

V. SUGGESTIONS

- I suggest improving coordination with suppliers and manufacturers to ensure timely and accurate delivery of CMRL tracks and other essential components.
- I recommend implementing advanced tracking systems for better visibility of imported tracks from shipment to installation, reducing delays and improving project timelines.
- I propose enhancing the documentation process to streamline the customs clearance of CMRL tracks, ensuring all regulatory requirements are met without delay.
- I suggest strengthening relationships with shipping companies and port authorities to address port congestion, handling issues, and ensure smoother transportation of large and heavy CMRL track components.
- I recommend investing in specialized equipment for the safe handling and transportation of CMRL tracks, considering their size and weight, to prevent damage and delays during import.
- I propose establishing a dedicated team for the management and monitoring of CMRL track imports, ensuring compliance with safety standards and regulations throughout the entire process.
- I suggest conducting risk assessments to anticipate challenges such as customs issues, fluctuating tariffs, or transport strikes, and to develop contingency plans for these risks.
- I recommend enhancing collaboration with local authorities to speed up regulatory approvals and clearances needed for the installation and use of imported CMRL tracks, reducing waiting times.

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V. CONCLUSION

The process of importing CMRL tracks is faced with several significant challenges that impact the efficiency and timeliness of the project. One of the key difficulties identified is the lack of seamless coordination between suppliers, manufacturers, and transportation providers, leading to delays and mismanagement of critical deliveries. The complexity of handling large, heavy, and specialized components, such as CMRL tracks, requires specialized equipment and handling protocols, which are not always readily available. Additionally, documentation errors and customs clearance procedures present a persistent bottleneck in the importation process, often leading to further delays. Port congestion and inadequate infrastructure also contribute to delays and increased costs, affecting the smooth flow of imports. Despite these challenges, there is a clear need for better communication and planning across all parties involved, as well as investment in technology for real-time tracking and monitoring. By addressing these challenges, improving infrastructure, and enhancing coordination with local authorities and stakeholders, the efficiency of importing CMRL tracks can be significantly improved, supporting the timely completion of infrastructure projects.

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