A STUDY ON CROSS DOCK OPERATIONAL FEASIBILITY IN SGS LOGISTICS CHENNAI

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ABSTRACT

Cross-docking is a practice in logistics of unloading materials from an incoming semi-trailer truck or railroad car and loading these materials directly into outbound trucks, trailers, or rail cars, with little or no storage in between. This may be done to change the type of conveyance, to sort material intended for different destinations, or to combine material from different origins into transport vehicles (or containers) with the same or similar destinations. Cross-dock operations were pioneered in the US trucking industry in the 1930, and have been in continuous use in less-than-truckload (LTL) operations ever since. The US military began using cross-docking operations in the 1950s. Wal-Mart began using cross-docking in the retail sector in the late 1980s. In the LTL trucking industry, cross-docking is done by moving cargo from one transport vehicle directly onto another, with minimal or no warehousing. In retail practice, cross-docking operations may utilize staging areas where inbound materials are sorted, consolidated, and stored until the outbound shipment is complete and ready to ship.

1. INTRODUCTION

A growing number of communities and economic interests in our state recognize that efficient freight movement is directly associated with the health of their local and regional economies, successfully balancing the demand for transportation capacity and service with the quantity supplied of those services and capacities. As a result, the public sector has made strategic investments that improve freight mobility through operational improvements and new public infrastructure. Cross dock warehouses and truck-rail facilities, where goods are transferred between truck and rail for shipment to markets, are intermodal examples of these improvements to freight movement in the region. The Project Team, led by Qvigstad & Associates, Inc., was retained to conduct the cross-dock feasibility study efforts in coordination with SCJ Alliance and a Port executive-level policy committee. The general purpose of this research was to investigate the potential economic viability of cross-dock, warehousing and/or intermodal truck-rail facilities for tree fruit growers in North Central Washington. The study was intended to help decision makers evaluate the need for a new cross-dock facility and other strategic investments or strategies that would increase the competitiveness of the region. After initial meetings, the Port Steering Committee agreed to center the study on the apple industry due to the volume and value of fruit shipped from the state.

1.1. ADVANTAGES

- Streamlines the supply chain, from point of origin to point of sale
- Reduces labor costs through less inventory handling
- Reduces inventory holding costs by reducing storage times and potentially eliminating the need to retain safety stock
- Products reach the distributor, and consequently the customer, faster
- Reduces or eliminates warehousing costs
- May increase available retail sales space
- Less risk of inventory handling

1.2. APPLICATIONS

- "Hub and spoke" arrangements, where materials are brought in to one

central location and then sorted for delivery to a variety of destinations

• Consolidation arrangements, where a variety of smaller shipments are combined into one larger shipment for economy of transport

• Deconsolidation arrangements, where large shipments (e.g., railcar lots) are broken down into smaller lots for ease of delivery Retail cross-dock example: using cross-docking, Wal-Mart was able to effectively leverage its logistical volume into a core strategic competency.

• Wal-Mart operates an extensive satellite network of distribution centers serviced by company-owned trucks

• Wal-Mart's satellite network sends point-of-sale (POS) data directly to 4,000 vendors.

• Each register is directly connected to a satellite system sending sales information to Wal-Mart's headquarters and distribution centers.

1.3. FACTORS INFLUENCING THE CROSS DOCK OPERATION

• Cross-docking depends on continuous communication between suppliers, distribution centers, and all points of sale
• Customer and supplier geography, particularly when a single corporate customer has many multiple branches or using points
• Freight costs for the commodities being transported
• Cost of inventory in transit
• Complexity of loads
• Handling methods
• Logistics software integration between supplier(s), vendor, and shipper
• Tracking of inventory

2. COMPANY PROFILE

We are in the shipping field for the last 23 years and have been successfully doing Clearing and Forwarding, Freight Forwarding & Trailer Transportation business. Since that time we have served the community through hard work, dedication, innovation and technology. We are committed to continuous improvement of our services and ourselves. We believe that our commitment to our purpose and mission has shaped an organization well suited for today's business environment.

2.1. The Mission

The mission of SGS is to continually expand and improve our services to meet and exceed customer requirements, and accommodate their evolving growth and success. We will accomplish our mission with integrity, morality, and a team approach that allows us to continue to be a distinctive leader in the Shipping & Logistics industry, while providing good earnings and security for team members. We are dedicated to our industry. It is our duty as a Documentation and transportation intermediary to be aware of the Foreign Trade Policies, best lanes, routes, rates, classifications and other components of successful freight movement and apply them daily for the benefit of our clients and carriers.

2.2. Our Corporate Concept

As a growing C&F company, the corporate philosophy of SGS is:

• To protect clients' customers from any inconvenience related to freight delivery
• To be a single source convenience for every Logistics need of our clients
• To continually expand and improve service to meet and exceed client requirements and accommodate their evolving growth and success
• To address our jobs with complete integrity and morality
• To use a team approach for maximum efficiency and effectiveness
• To maintain a level of reasonable profitability that allows reinvestment into people, processes, systems, training, infrastructure, physical facilities and technology to accommodate growth smoothly

2.3. Experience

We have been in shipping field since 1991 and work almost all part of shipping activities. In our experience we have handled uncountable General box, ISO tankers, flat track containers, reefer, over dimensional cargo(ODC), open top container, one door open containers, Car carrier vessel break bulk movements and Air Shipments. We have well efficient staff who can work for you round the clock. Our operation team functions 24/7 at our office near PORT

DOCKS OFFICE to track given tasks also with the customs filling of bill for 24 hrs.

2.4.Summary

SGS is applying new rules for success. Good basic service is no longer enough. We believe in continuous incremental improvement -- raising the bar, each day, every day. We understand that with all the technology that surrounds us, this is still a people business. We cultivate relationships not only with our customers and carriers but also with our fellow team members. Every great company, every great brand and every great career has been built in exactly the same way -- bit by bit. If every element gets a little better every day, then that organization or that person becomes unstoppable. An organization that builds that kind of momentum will soon evolve into a market leader.

3. REVIEW OF LIETRATURE

Alpan, G., Ladier, A. L., Larbi, R. and Penz, B., "Heuristic Solutions for Transshipment Problems in a Multiple Door Cross Docking Warehouse," Computers & Industrial Engineering, 61, 402-408 (2011). Alpan, G., Larbi, R. and Penz, B., "A Bounded Dynamic Programming Approach to Schedule Operations in a Cross Docking Platform," Computers & Industrial Engineering, (2010).

Cross docking is a warehouse management concept in which items delivered to a warehouse by delivery trucks are immediately sorted out and reorganized based on customer demands and are routed and loaded into shipping trucks for delivery to customers without actually being held in inventory in the warehouse. If any item is to be held in storage, it is only for a brief period of time that is generally less than twenty-four hours. This way, the turnaround times for customer orders, inventory management cost, and warehouse space requirements are reduced. Because accuracy in material management is required in such operations, a cross docking operation is heavily dependent on accurate flow of information.

Baptise, P. and Maknoon M. Y., "Cross-docking: Scheduling of Incoming and Outgoing Semi Trailers," 19th International Conference on Production Research ICPR, (2009).

Crossdocking is defined as an operational strategy that moves items through consolidation centers or cross docks without putting them into storage. As the need to move inventory faster increases, more logistics managers are turning to cross docking but the ability to execute such strategy well depends on good planning, dynamic scheduling and coordination. This paper introduces our research and development work on cross docking solution in three aspects: optimized planning on container grouping, clustering, sequencing and allocating containers to docks; real-time scheduling handles the dynamics of container arrivals and actual pallet transfers; and cross-docking coordination conducts real-time task assignment/sequencing and resource management to deal with dynamic cha

Boloori Arabani, A. R., Fatemi Ghomi, S. M. T. and Zandieh, M., "Meta-heuristics Implementation for Scheduling of Trucks in a Cross-docking System with Temporary Storage," Expert Systems with Applications, (2011).

4. DATA COLLECTION

4.1. Primary Sources:

Tool used: Structured Questionnaire Conducting QWL study required the preparation of a detailed questionnaire which could capture all possible areas of their agreed levels. Prior to preparation of questionnaire I circulated a questionnaire to all SGS international logistics service pvt ltd customers and staff regarding the objectives of my study. The questionnaire included twenty two questions. There were questions on a 5 point scale, where 1 is the least agreed level and 5 is the most agreed level.

4.2. Secondary sources:

The major sources of secondary data were the documents and records of the organization, the annual reports and the literature review.

4.3. Data collection

Data collection done through interactions with Customer's staff, office workers and employees.

Research Instrument

A well structured distinguished Questionnaire is used to collect the primary data. It consists of closed ended questions.

4.4. CONCEPTUALIZATION

FORKLIFT:

A **forklift** (also called **lift truck**, **fork truck**, **fork hoist**, and **forklift truck**) is a

powered industrial truck used to lift and move materials over short distances. The forklift was developed in the early 20th century by various companies, including Clark, which made transmissions, and Yale & Towne Manufacturing, which made hoists.[1][2][3] Since World War II, the use and development of the forklift truck have greatly expanded worldwide. Forklifts have become an indispensable piece of equipment in manufacturing and warehousing.[4] In 2013, the top 20 manufacturers worldwide posted sales of $30.4 billion.

ODC:

- In simplest terms, ODC or **Over Dimensional Cargo is a cargo that protrudes outside the loading deck of the vehicle transporting the cargo.** If a truck with loading platform length of 20 feet is loaded with cargo like TMT bars of length 22 feet, then the TMT bars qualifies as Over-Dimension Cargo. If the same TMT bars were loaded on a vehicle with platform length of 22+ feet, it would have been classified as Normal Cargo rather than ODC. This definition of ODC is to resist industry from transporting Normal Cargo unnecessarily as ODC for small economic benefits compromising road user's safety.

BUMPERS

- a device for absorbing shock or preventing damage (as in collision) specifically a bar at either end of an automobile
- one that bumps
- a brief interval on radio or television filled with music, video shots, or voice-overs that marks a break between a program and a commercial

TRUMP

In bridge whist, and similar card games. a playing card of the suit chosen to rank above the others, which can win a trick where a card of a different suit has been led. 'declarer ruffs the opening lead and plays a trump'

4.5. HYPOTHESIS

H0: There is no significance relationship between turnover of the company and volume of goods export

H1: There is a significance relationship between turnover of the company and volume of goods export

H0: There is no significance relationship goods are handled with and there is no delay in the unloading and loading of goods

H1: There is a significance relationship goods are handled with and there is no delay in the unloading and loading of goods.

5. DATA ANALYSIS AND INTERPRETATION

The term analysis refers to the computation of certain measures along with searching for patterns of relationship that exist among data groups. The data after collection has to be processed and analyzed in accordance with the outline laid down in research plan or research design. This is essential for a scientific study and for ensuring that we have all relevant data for making comparisons and analysis. Technically processing of data implies editing, coding, classification and tabulation of collected data so that they are available for analysis. "Thus in the process of analysis, relationships or differences supporting or conflicting with original or new hypothesis should subject to statistical tests of significance in order to determine with what validity data can be said to indicate any conclusions."

DESCRIPTIVE STATISTICS

Descriptive statistics is the term given to the analysis of data that helps describe, show or summarize data in a meaningful way such that, for example, patterns might emerge from the data. Descriptive statistics are simply a way to describe our data. "Descriptive analysis is largely the study of distribution of one variable. This study provides us with profiles of companies, work groups, persons and other subjects on any of a multiple characteristics such as size, compositions, efficiency, preferences etc."

Descriptive analysis is more specific in that they direct attention to particular aspects or dimensions of research target. Such studies reveal potential relationship between variables, thus setting the stage for more elaborate investigation later. It is a search for broader meaning and research findings. It is the device through which the factors that seem to explain what has been observed by researcher in the course can be better understood and provides theoretical conception which serve as a guide for further researches. It is essential because it will

lead towards findings of the study and proper effective conclusions of the study. Descriptive approach is one of the most popular approaches in these days. In this approach, a problem is described by the researcher using questionnaire or schedule. This approach enables a researcher to expose new

5.1 **Type of Goods**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Perishable	11	11.0	11.0	11.0
	non perishable	22	22.0	22.0	33.0
	Toxic	23	23.0	23.0	56.0
	industrial goods	44	44.0	44.0	100.0
	Total	100	100.0	100.0	

INTERPRETATION

In the above specified table 11% of respondent's specified perishable, 22% respondents specified non perishable, 23% of respondents specified Toxic, 44% of respondents specified industrial goods. Therefore the most of the respondents are specified daily.
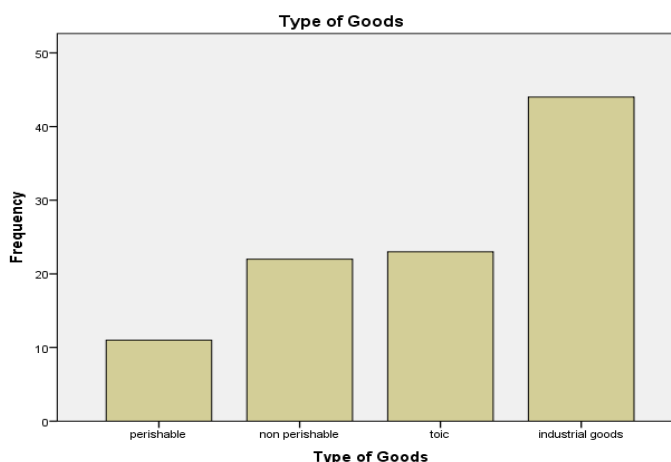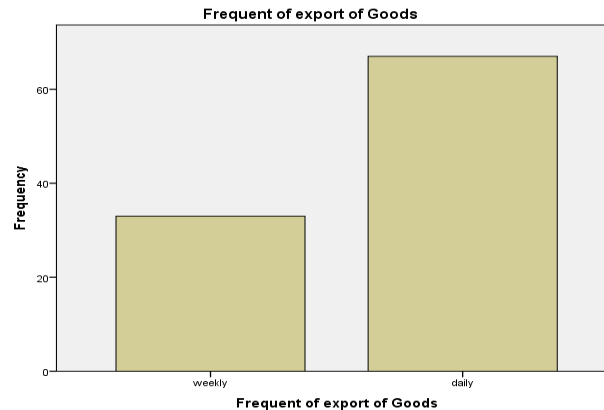

5.2 **Frequent of export of Goods**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	weekly	33	33.0	33.0	33.0
	daily	67	67.0	67.0	100.0
	Total	100	100.0	100.0	

INTERPRETATION

In the above specified table 33% of respondents specified weekly, 67% respondents specified daily. Therefore the most of the respondent are specified daily.

Frequent of export of Goods

6. CONCLUSION

Cross-docking is a technique firstly proposed to reduce the storage space and flow time, simultaneously. This paper addresses a truck scheduling problem, in which a position-based learning effect is taken into consideration for unloading and loading tasks done by human labors in many related environments. The goal of the given problem is to minimize the mean completion time of outbound trucks. Cross-docking is a system, in which the concepts of both warehouses and distribution centers are considered. In such systems, delivered goods to cross-docking centers by inbound trucks should be unloaded, sorted, and labeled to prepare required items for outbound truck. As a result, the paper, on hand, considers a truck scheduling problem at cross-docking terminals, in which there is a learning effect for unloading/loading processes in shipping and receiving doors. In fact, it is desired to develop a mathematical model for this aim and solve that by using statistical tool in it.

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