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Urban Consolidation Centre – In Context with Construction Consolidation Centre a Comparative Analysis

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Abstract

Construction industry toiling with the adversarial relationship, competitive market, and low overall revenues continues to investigate, study and implement various frameworks that can enhance the relationship among the parties, standardize processes, and enhance productivity and profit margins. The paper takes into account the concept of lean manufacturing/production of waste minimization by the concept of UCC which dates back to 1970s, one of oldest and still functioning UCC is in Tenjin, Japan which was started in 1978. The study is done on UCC's at a different geographical location across the world trying to identify the factors that contribute to make it a success or failure. Based on the study-specific questions are prepared to analyse UCC's implementation in Asia's largest slum Dharavi situated in Mumbai the Financial Capital of India and will seek an answer to the question - can it help enhance the makeover of Dharavi

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1. Introduction

Construction is governed by low-profit margins and various studies had been done and continue in the future to adapt and implement various systems that can enhance the productivity and profit margins. One such approach is to explore the transfer of lean manufacturing/production from the Japanese manufacturing industry to the construction. The Japanese automobile Toyota developed the philosophy "Lean". Lean manufacturing concentrates on adding value by waste minimization ("MUDA"), an impossible task, and overburden on employees ("MURI"), unevenness, irregularity, non- uniformity ("MURA").

It is evident that the Construction industry generates tons of waste. As per NBS website the Department for Environment, Food and Rural Affairs (DEFRA). It reported in their Feb 2018 edition of "UK Statistics on Waste" that in 2014 the UK generated 202.8 million tonnes of waste.

Table 1 UK statistics on waste generation

Government Organization Report (CDE) Wastes	Data
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Construction Demolition and Excavation. “(DEFRA) Department for Environment, Food and Rural Affairs”	59% of 202.8 million tonnes
BREEAM Construction industry accounts for approximately	55%
OPERATIONAL WASTES (carbon emission)	
Building operation	50% of the total CO2
Global Industrial carbon emission due to the manufacture & processing of five key building materials:	
Steel	25%
Cement	19%
Paper	4%
Plastic and Aluminium	3%
The industry is also the primary consumer of the building material	The Industry consumes: Aluminium - 26% Steel - 50% Plastic - 25%

[1]

Therefore researchers are trying to optimize the wastes. These being the reason which attracts researches from the construction industry to try and minimize the waste at different stages/phases of construction. Construction has different stages/phases. One such stage/phases identified is the supply of materials for construction (that accounts for waste generation)i.e transportation and stacking of materials to the construction site. The fact is materials are wasted during transportation due to handling. The “MURA” which can be attributed to the reason for the existence of the seven wastes. It can be inferred that it leads to MUDA. For example, construction requires specific materials to be transported and stacked at the site as per scheduled requirement. Overstacking leads to unnecessary piling of material and not fulfilling the requirement which results in waiting. The construction activity can be adversely affected due to non-availability of materials on site which can result in project delays. Both over stacking and waiting are wastes. To avoid such scenario JUST IN TIME approach “KANBAN” came into picture which focuses on delivering the right material, at right quantity and at right time.

The transportation of materials offers a great challenge in Urban Areas (Urban area is the human settlement which is defined as having high population density & infrastructure of the built environment). The traditional method of freight delivery cannot address the intensification of transport freight through the inner- city areas as it may results in traffic congestion, environmental devastation, increased noise level and increase the probability of accidents. The freight delivery is based on the concept of direct delivery of the products to the recipient. Every delivery made by large size trucks in the city Centre is independent and causes traffic congestion thereby increasing the exhaust emission and environmental degradation. In recent years “Urban Consolidation Centre” has proved to be an alternative against traditional freight system. The concept of UCC dates back to the 1970s, one of the oldest and still functioning UCC is in Tenjin, Japan which was started in 1978. UCCs are among the emerging trends in most of the developed countries. Germany has about 12 UCCs operational. The countries like England and Italy have also opted for UCCs.

2. Literature review

The literature review is done to get the overview of Urban Consolidation Centers and it’s applicability some of the places where it had been operational are covered. The objective is to find out it’s working and operation and try to figure out how they function, a basic requirement, cost aspects etc. As per the understanding, the Construction

Consolidation Centre is the subset of Urban Consolidation and therefore the study is beneficial to have a greater understanding of the concept

It's a concept of logistics taking in the basic of Japanese philosophy. The problem in developing logistic management and find answers on how to improve the construction logistics in the urban area. The aim is to reduce the cycle's of transport and improve the time efficiency of delivery.

One of the major obstacles in obtaining the effective operation of construction logistics in the urban cities is the fact that they are urban cities having narrow streets, continuously growing traffic and narrow streets. More effective logistics will result in less traffic, lower sound and air pollution levels, which can be achieved by collaboration in the construction business. Although the collaboration is difficult to achieve due to fragmentation and adversarial nature of the business. If this redundancy is removed it can result in improved logistics in the construction sector.

Logistics gives economic advantage due to improved work efficiency. As per Council of Supply Chain Management Professional (CSCMP): Logistic Management is a part of supply chain management that is responsible for planning, implementation and controlling the efficiency, effective in both forward and reverse flow, storage of goods and services and also relating to the information between point of origin, point of consumption so that it could meet customer's requirements.

The city centre is under a large amount of pressure due to a large amount of traffic. The streets are narrow with a large number of vehicles, overcrowded pedestrians this all factors give limited space for freight transport. The figure below depicts the activities that are commonly performed in logistics management.

As stated above the obstacles and adversarial nature of the construction are not the only problem. The interview conducted at Stockholm revealed that many recipients was sceptical about the construction of permanent logistics centre in the outskirts. The capital size and the number of construction projects at the current and future situation were the reason for scepticism. According to Skanska's production manager, Simon Lindholm "the use of logistics centre would evidently happen if the number of projects was of the same type and in a range of each other". This statement was equally agreed by Eva Sunnerstedt at Stockholm of Environment and Health Department. The scepticism was due to large centre however many agreed for the temporary localcentre at a different scale of large projects. Norra Djurgardsstaden and Hammarby Sjostad are two such examples. The report depicts that the number of transports was reduced by 30- 40 %. [2]

3. Methodology

The methodology adopted is the comparative analysis of different construction consolidation centre and interview conducted on Quantity surveyor & site engineers, getting a response from the questionnaire. The responses were taken from people working in the construction industry, site engineers, students having relevant knowledge on the subject matter and the faculty members. The responses gathered were binary that is in yes or no and in some questions option of can't say and not sure were provided. The analysis is done by Chi-square method of hypothesis testing.

The following questionnaire was prepared to get the views/opinion on the specific question.

The questionnaire consists of three parts:

1. The first part to get information about the individual participating in the questionnaire. The information like:
 - I. Their current working under which party govt. , private etc.
 - II. Size of the project.
 - III. Experience
 - IV. Andthe type of project
2. The Second section focuses on Construction Consolidation Centre – The basic understanding and tries to get the views of the professionals on the following attributes:

Attributes/ variables	Reference
Size of the project for use of CCC	[13]
Financial viability.	[21][25]

Administration of CCC.	[21][13]
Financing party of CCC.	[21][13]
Secrecy and sharing of information.	[21]
Addressing questions regarding liability, theft etc.	[21]
Application of CCC in the long run.	[21]
Advantages of CCC. in the long run.	[13][21][14][3][1][10][25]It's used [13][21][14]
The party who should take responsibility to administer CCC.	[21]
The rigidity of Construction in the application of different concept	[3][21][9][10]

3. The Third section on the questionnaire tries to access the views of professional on “Mumbai Dharavi” can CCC be beneficial:
 - I. The advantage of CCC in Mumbai- lower traffic, reduce pollution
 - II. Can it be used for a longer period?

4. Discussion

The study done revealed that as per India industry small size of the project is not financially viable and due to the competitive market of industry there is fear that the secrecy of information can be revealed to the third party & the rigidity of construction industry to change remains the main drawbacks.

The solution can be increasing collaboration and cooperation, training, education, standardization in the sector. Another possible solution can be the use of trial projects. Further, the logisticscentre can be used for the long run that is it could be either permanent (serving for construction projects over a long period of time) or temporary serving single project for a limited time.

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