International Journal of Scientific Research & Engineering Trends
Volume 4, Issue 5, Sept-Oct-2018, ISSN (Online): 2395-566X

Reverse Logistic Management in Construction

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Abstract -**Reverse logistics in construction refers to the movement of products and materials from rescued buildings at a new construction site. Given the various facets of the reverse logistics series, there is a large number of studies, but there is no systematic review of literature on this important topic applicable to the construction industry. Therefore, the purpose of this study is to integrate the fragmented body of knowledge on reverse logistics in the construction, with the aim of promoting the concept among the stakeholders of the industry and the wider construction community. Through qualitative meta-analysis, the study synthesizes the findings of previous studies and presents some of the tasks required by industry stakeholders to promote this concept in the context of real interest. First, the research and terminology tendency for reverse logistics has been introduced. Second, it detects the main advantages and constraints of reverse logistics in construction, while providing some tips for using these benefits and reducing these constraints. Finally, it provides future research direction based on the review. Unlike the manufacturing context, due to inadequate RL literature in the construction sector, this could be one of the reasons. Consequently, the knowledge of RL and its applications in the construction sector is limited. To solve this issue, this study attempts to identify and highlight the fundamental aspects of the RL concept, which dramatically affects its adoption and implementation through an integrated review of literature.**

Keywords- **Reverse logistics series**, s**ocio-economic environment, SCM system.**

I.INTRODUCTION

Reverse logistics is a relatively settled field in Manu facturing, its uptake in the construction industry is limited. Despite the interest in re-use, recycling and general environmental concerns, the industry suffers from not having well organized. Reverse logistic network that is connected to the traditional forward logistics. This is in the backdrop of construction industries' notoriety, being the largest contributor of waste to landfill adversely affecting urban and socio-economic environment. Implementing reverse logistic has proven to be an effective strategy to make organization more competitive in the manufacturing sector. However, the construction industry has been a laggard in harnessing the benefits of RL in comparison to the manufacturing industry.

The limited knowledge of RL practices within the construction context could be regarded as one of the main barriers of RL adoption in this industry. The paucity and fragmented nature of available research studies on RL in the construction literature could be deemed to be a contributor to the lack of knowledge and accordingly low-level adoption of RL. As opposed to the substantial body of knowledge of RL in the manufacturing context, RL has remained an overlooked area within the construction industry. As pointed out by Schultman, reverse logistic has received attention from academia in construction field only recently.

II.TERMINOLOGY

The basic terminology for reverse logistic management in construction management is described below.

The study attracts an integrated literature review approach and then synthesizes literature. This research methodology was selected due to evidence-based reports to achieve the following objectives:

- Identify musical variables affecting an event.
- Map relationships between recognized variables.
- Identify undiscovered areas in the body of knowledge to guide further research studies.

The above objectives are consistent with the purpose of this study. Apart from this, many references prove the novelty of RL literature, recommend the integrated literature review. The notion that synthesis the literature of any emerging event will add value to its body of knowledge by conceptualizing and categorizing relevant factors and consolidating current information into conceptual models. With the same token, previous studies have emphasized the need for existing literature

synthesis on RL in the integrated body of knowledge to clarify the strategic aspects of RL.

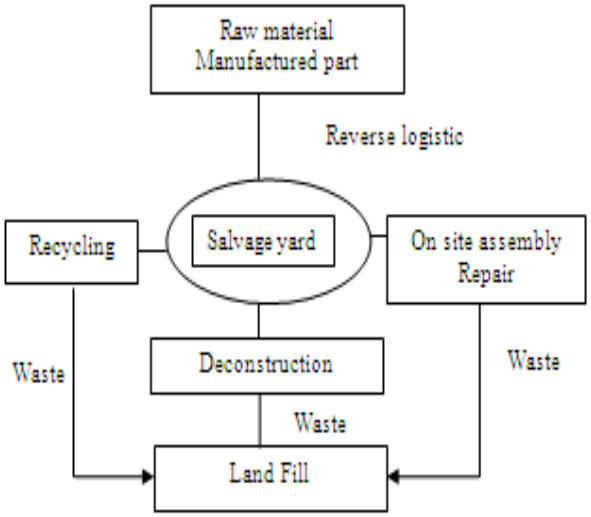

Fig.1 Terminology of RL.

Looking at the multi-dimensional nature of the study, the materials to be reviewed in the following two areas were discovered. To collect relevant texts from the construction sector, the method published in Yi and Chan's comprehensive review of the literature was adopted to search and select relevant literature. This included a complete search using the "Title / Abstract / Keyword" field. "Reverse Logistics", "Closed Loop Supply Chain", "Deconstruction" and "Material Reuse" were used as search description keywords for relevant review.

The journals reviewed for the construction industry include: Construction Management and Economics (CME), Journal of Management in Engineering (JME), Engineering, Construction and Architecture Management (ECAM), Automation in Construction (AIC), International Journal of Project Management (IJPM), And Building Research and Information (BRI) [24] In addition, magazines in the construction sector include highly cited papers including the Journal of Computing, Building and Environment (BAE), Canadian Journal of Civil Engineering (CJSE) and Civil Engineering (JCC), which were added to the search list as And Chan's study applied the recommended strategy by Webster and Watson [25] and used by Pokharel in the first RL concept.

That is, for this study, the documents quoted in the publications found in the database were evaluated by at least two researchers for the purposes of the study. The relevant publications were included in the review process. A total of 96 articles were reviewed from the construction context and a total of 231 sources from the manufacturing industry were reviewed. The conceptual model was presented in a cozy loop diagram (CLD) format. The CLD is a useful and flexible tool to illustrate the system's response structure and to show the fundamental relationship between the elements of the system for any of the domains mentioned by Sterman. The Vensim PLE package was used to create models and casual charts.

III.PROBLEMS SURROUNDING LOGISTICS

Due to the lack of definition for RL in the construction context, there have been misconceptions and confusion about the real boundaries between RL and similar events like waste management or further logistics. To address this, the following sections discuss the general terms of the RL concept. On the contrary, construction industry is suffering from disruption of the lack of coordination between design, construction, operation, poor communication and involved parties. If existing buildings are not designed to design and destroy easily, then it can generate a challenge during dehydration, consequently the process will be expensive and only ending in removing some reusable materials.

There is another big obstacle for RL, a very long life of changing ownership buildings, which presents some saved items obsolete. Due to the unique and one-nature of buildings, differences in decline rate create uncertainty for RL. As the Schultman emphasizes, the structure of the buildings is not generally known at the end of their lives. Thus, RL stakeholders have to be forced to deal with different types of product properties after dehydration. The lack of infertility of the infra-structure, especially for recovery facilities, infrastructure, technology and market rescues, has been highlighted by many research studies.

1.RL versus Forward Logistics (FL)

Further logistics are mainly related to the movement of materials from points of origin towards points of consumption. On the contrary, RL manages the movement of goods, products and materials towards specific points of origin from [43] the normal consumption points. The intuitive assumption of RL indicates that the direction of the goods, materials and products in the reverse flow should be mirror exactly about the flow.

Nevertheless, RL is a symmetrical picture for logistics most of the time. In real SCM systems, materials, goods and products can be distracted by a reverse route towards a wide range of sites like potential channels and secondary markets, while still can be included within the RL system. In this view, returning materials, goods and products do not necessarily go back to the exact points of origin.

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5. Policy Makers

Avoid landfill costs to make RL a viable option

- Legal issues of dumping should be included in the issue.
- Introduce encouraging financial and regulatory incentives
- Use of materials rescued in new construction
- Introduce the standards for inclusion of the materials saved in the new construction.
- Promoting decisiveness by presenting the guidelines
- They will take care of risks in those operations

IV.CONCLUSION

RL has proved to be a durable exercise that many can offer Benefits for the construction industry However, it is yet to be done Fully exploited in the real world. Current study provides a profound practical effect Regarding adoption of this practice, for construction organizations. Challenges faced by building organizations in adopting RL have been revealed from existing literature Highlights potential economic, environmental and social benefits. Consequently, the study brings to the primary factors prior to adoption of RL in manufacturing organizations. Its main effect for construction practitioners The knowledge needed to make RL decisions (i.e. advantages and disadvantages) is synthesized from a broad list of publications and presented in a sensible style.

ACKNOWLEDGEMENTS

To enhance the quality of the author, the three creative reviewers and the editor of the waste management and research want to express their sincere gratitude for their creative and helpful comments.

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