



Employee Perception of the Effectiveness of the Warehouses: With Special Reference to the Telecommunication Infrastructure Development Field, Sri Lanka

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ABSTRACT

Warehouse plays a major role in logistic operations especially in the telecommunication infrastructure development industry. Inefficient warehouse management makes huge cost to the company. Thus, it is important to manage warehouses especially in this industry as they are using very specific materials, machineries, equipment and tools. On the other hand, firms need to keep larger as well as costly inventories for the successful completion of the construction projects. This implies the differences with compared to other type of warehouses and also generates some specific requirements in warehousing for this industry. Thus, this research study focuses to identify and examine the factors affecting effectiveness of warehouses in telecommunication infrastructure construction industry. The study was carried out by performing a comprehensive survey and a questionnaire was used to get the feedback from the selected sample which comprises both executive and non-executive employees work in warehouses. For the purpose of analysis, descriptive statistics and other statistical tools were used to examine the factors. Through the study, environmental impacts, emergency unloading and safety & protection were identified as largely affecting factors to the warehouse effectiveness and their behaviours were further examined. Based on findings, the paper has given recommendations for telecommunication infrastructure construction firms to effectively manage their warehouses for the better performance in their construction projects.

KEYWORDS: Construction Industry, Sri Lanka, Telecommunication Infrastructure, Warehouse

INTRODUCTION

Warehouse management is a very important aspect for every organization since the proper warehouse management makes the works more efficient while the improper warehouse management makes some extra costs and inefficient. On the other hand, the importance of the warehouse management also increases with the value of handling materials, machineries and equipment in the warehouse. Telecommunication infrastructure construction field is such specific area where various types of valuable materials, machineries and equipment are handled.

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Hence, it is very important to study about the affecting factors on the effectiveness of the warehouses of telecommunication infrastructure construction field.

LITERATURE REVIEW

Construction is the one and only task in a production work in which the outcomes of the production process are static on the production floor. The following areas are considerable in this construction processes: processes are unique and significant for each and every production area and its environment; production floors do not adjust or change the design of the structure; the products which are produced by the production firm are assembled and implemented on an dynamic environment; the structures of the production floor exist for a long time without changing and are flexible to modify in order to changing demand; rules and regulations of the firm

have an essential place in the production (The Construction Sector System Approach, 2004).

Materials which are used in the constructions have a significant impact on the total expenses of the project where the 50-60 percent of the total cost of the project is born by the cost for those materials. Since this significance of the cost, it is needed to manage the cost of the materials in construction projects most importantly in inventory management. Tracking the materials delivery and locating them in the inventory efficiently are much important in that case. In effective tracking of construction materials and improper storing will lead to make the construction projects time consuming and unsuccessful (Kasim et al., 2012).

Nowadays, the advancements in digital telecommunication lead to improve the economic development in all over the world while improving the quality of living patterns of the people. Even though the investment in production sector was limited into where the information and the physical resources located in the past, there is no need to limit it only to the urban areas at present with the help of the technology and communication network developments. All there imply the importance of the telecommunication infrastructure developments (Egan, 1996).

Warehouses play a significant role in logistics activities as well as the supply chain which impact on the speed and the cost of those activities. Each and every single activity has huge impact on the effectiveness and the efficiency of the warehouses. The performances of the warehouses highly depend on the technological knowledge of the warehouse managements. By using statistical approach to identify influencing factors on the effectiveness of the warehouses will help to improve the quality of the assessments and researches on the warehouse management, further (Johnson, 2005).

Inventory management is the process of efficiently overseeing the constant flow of units into and out of an existing inventory. This process usually involves controlling the transfer in-off units in order to prevent the inventory from becoming too high, or dwindling to levels that could put the operation of the company into jeopardy. Competent inventory management also seeks to control the costs associated with the inventory, both from the perspective of the total value of the goods included and the tax burden generated by the cumulative value of the inventory.

In addition to maintaining control of the volume and movement of various inventories, inventory management also makes it possible to prepare accurate records that are used for accessing any taxes due on each inventory type. Without precise data regarding unit volumes within each phase of the overall operation, the company cannot accurately calculate the tax amounts. This could lead to underpaying the taxes due and possibly incurring stiff penalties in the event of an independent audit (www.barcodesinc.com, 2013).

RESEARCH PROBLEM

In construction field, warehouses play a significant role as it is essential to keep the raw material stock as required to run the construction processes smoothly and properly. Due to its uniqueness in these raw materials, warehouses need to have specific requirements according to the stored materials and machineries. For example, some of the materials required to maintain under some specific conditions such as chemicals and some instruments with digital measuring meters.

In telecommunication infrastructure construction field, those materials, machinery, equipment and tools are very specific. Some of them are Cable bracket accessories (Straight and angle clamps, One/Two side bolt brackets, Stay and Strut sets etc.), Chemicals such as Bentonite & Rheobuild 1000, machineries such as

Horizontal Directional Drilling (HDD) machine, handheld GPS Units etc. So the requirements in the warehouses in this type of construction field are very specific and different.

On the other hand, warehouse holding cost is one of the major cash outflows for any industry. Thus, it is important to maintain the stock levels at the required and sufficient level, Further, maintaining the quality of the specific warehouse materials and machineries in standard levels is also utmost important.

To reach the above mentioned requirements, warehouses need to modify their processes which are currently practicing in the telecommunication infrastructure development sector warehouses, in order to improve the effectiveness of the warehouses. Hence, the main objective of this research study was to develop a proper framework for the warehouses in telecommunication infrastructure development field including the mostly affecting factors on the effectiveness of those warehouses.

METHODOLOGY

Characteristics of the warehouses in telecommunication infrastructure development sector were identified through literature. Based on collected facts, questionnaire was designed aiming to identify affecting factors for the effectiveness of the warehouses. Meanwhile, required secondary data were gathered through the literature. Cluster sampling technique was applied when selecting the respondents for the questionnaire. There were 86 questionnaires distributed among both executive and non-executive level employees.

The collected data were analyzed to identify the influencing factors. Based on the findings, the recommendations to improve the effectiveness of the warehouses were made. To collect the data on the employees' perception on the level of the relatedness of those topics with the effectiveness of the warehouses, a questionnaire was designed covering all the

fields which were identified with the help of the citations, observations and reports & summary generated by the store keepers and the other parties.

DATA COLLECTION AND ANALYSIS

To go through the designed model of the research, the employees' perceptions of the factors affecting to the warehouses effectiveness were gathered from 86 employees covering both executive and non-executive level. These gathered data were categorized according to the variables and their basic statistical behaviour was measured and given in Table 1.

Table 1: Related Statistics of Identified Variables

	Mean	Std. Deviation
Space Utilization	0.5581	.67156
Safety and Protection	1.2291	.38956
Scrap Management	0.4442	.33663
Waste Management	0.5610	.39096
Environmental Impacts due to materials/machineries	1.6337	.37120
Emergency Unloading	0.9128	.41439
Continues Maintenance	0.5959	.44253

According to the 5 point Likert scale analyzing on selected variables, environmental impacts was ranked as mostly affected factor for the warehouse efficiency. All the variables' significance was tested statistically and the results have been given in Table 2.

Table 2: Variable's Significant

	t	Sig. (2-tailed)	Mean Difference
Space Utilization	7.707	.000	.55814
Safety and Protection	29.259	.000	1.22907
Scrap Management	12.237	.000	.44419
Waste Management	13.308	.000	.56105
Environmental Impacts due to materials /machineries	40.815	.000	1.63372
Emergency Unloading	20.427	.000	.91279
Continues Maintenance	12.488	.000	.59593

According to the analysis, it shows that all the factors are having significant behaviours towards warehouse effectiveness. But according to their impact, environmental impact due to materials/machineries is the highest affecting factor for the warehouse effectiveness. It means that most of the employees think that there exists an environmental impact due to warehouse related works and activities. Safety & protection and emergency unloading are the next, significantly encountered factors for warehouse effectiveness.

Though scrap management shows significant behaviour, according to the perception of the employees, Scrap Management is not significantly affecting for the effectiveness of the warehouse. Similarly, waste management, space utilization and continuous maintenance are also not significantly affecting for the effectiveness of the warehouse.

After analysing the results through descriptive statistic, further analysis was carried out on mostly impacted variables to identify their behaviours on the basis of demographic factors. Analysis was carried out on following demographic factors.

- Employee Category
- Educational Level
- Service Duration

Table 3: Independent Samples Test for Environmental Impacts due to Materials/Machineries

	t	df	Sig. (2-tailed)	Mean Difference
Employee Category	0.640	84	0.524	.06607
Educational Level	0.691	84	0.492	.05777
Service Duration	0.028	84	0.977	.00275

According to employee category in demographic factors, there is no significant difference on their perception of impact on warehouse management relates to the environmental impacts. Also, it is same with the service duration and education level of the employee.

Table 4: Independent Samples Test for Safety & Protection

	t	df	Sig. (2-tailed)	Mean Difference
Employee Category	-8.205	84	.000	-.66382
Educational Level	-2.310	84	.023	-.19716
Service Duration	.560	84	.577	.05690

According to the analysis, significant differences among employee category and their education level have been shown in employee perception of safety and protection on warehouse effectiveness. Further analysis was carried out to identify the groups showing such differences. The analysis on those two factors is shown in the Table 5.

Table 5: Group Statistics for Safety and Protection

Description		N	Mean	Standard Deviation
Employee Category	1	16	0.6888	.41412
	2	70	1.3526	.25786
Educational Level	≥ 2	55	1.1580	.43226
	< 2	31	1.3552	.26069

According to the analysis, though executive employees are having less concern on safety and protection on warehouse effectiveness, non-executive members are concerning that as a highly affected factor for warehouse effectiveness.

Table 6: Independent Samples Test for Emergency Unloading

	t	df	Sig. (2-tailed)	Mean Difference
Employee Category	-3.247	84	.002	-.35357
Educational Level	-1.197	84	.235	-.11114
Service Duration	-1.040	84	.301	-.11194

According to the analysis on employee perception of emergency unloading, significant differences among different employee categories were identified. Thus, further analysis was carried out and the results are given in Table 7.

Table 7: Group Statistics for Emergency Unloading

Description		N	Mean	Standard Deviation
Employee Category	1	16	.6250	.34157
	2	70	.9786	.40321

The analysis shows that the non-executive employees are having higher significant concern on emergency unloading relates to the warehouse effectiveness with compared to executive personals.

RESULTS AND DISCUSSION

According to the above analysis, environmental impact due to materials/machineries, safety and protection and emergency unloading, have been significantly affected to the warehouse effectiveness.

According to further analysis, in factor of 'Environmental Impacts due to Materials/Machineries', a difference cannot be identified against any of the demographic factors of 'Employee Category' or 'Educational Level' or 'Service Duration'.

But, in employees' perception on the factor of 'Safety and Protection' there is a difference, against 'Employee category' and 'Educational level of the employees'.

When concerning on the employee perception on 'Emergency Unloading' against all the three demographic factors of Employee Category, Educational Level and Service Duration, a difference can be identified only against 'Employee category'.

CONCLUSION

Through the findings of the analytical part of the study, it can be concluded that the Environmental Impacts due to Materials/Machineries is a significant factor in increasing the effectiveness, as the telecommunication infrastructure sector deals with many chemical and hazardable materials and equipment. Hence, the warehouse layout should be developed in order to be capable to maintain a good quality on the chemical using processes and

all the other activities which will impact on the environment as well as the employees.

Secondly, the Safety and Protection is also highly influencing factor for the effectiveness of the warehouses, hence the warehouse layout should be modified in order to make the working environment more safely where the tools and equipment usage, very high. In the same factor, to make the working environment more safely, the employees should properly be made aware and influenced to wear the safety equipment when they work.

Emergency unloading makes a huge effect on the effectiveness of the warehouse as well. Even though the warehouse is properly designed, if there is no any place for the emergency unloading, it will eliminate the effective process of the warehouse. Hence, there should be a place for emergency unloading while considering the working shifts as well as the warehouse layout.

When demographic factors are considered, there is no much difference in all the considered three demographic factors on the factor of 'Environmental Impacts due to Materials/Machineries'; one of the affecting factors on the effectiveness of the warehouses in the considered field.

As the employees' perception on the factor of 'Safety and Protection' is different against 'Employee category' and 'Educational level of the employees', it is needed to make aware the employees who are not educated about the effect of Safety and Protection while creating a good understanding among two employee category regarding 'Safety and Protection' to make the working environment much safer to work.

Since third factor which is affecting on the effectiveness of the warehouses in the considered field; 'Emergency Unloading' is different only against the 'Employee category', again the need of good understanding is raised among two employee category where the expected

outcome is more feasible to implement in the warehouses. Otherwise, even though the emergency unloading point is appointed, it will not work if there are any conflicts regarding the perceptions of the employees.

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