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Employee Perception of the Effectiveness of the Warehouses: With Especial 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: Warehouse, Construction industry, Telecommunication Infrastructure, Sri Lanka

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Introduction

Warehouse management is a very important aspect for every organizations 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 the 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. Hence, it is very important to study about the affecting factors on the effectiveness of the warehouses of telecommunication infrastructure construction field which handle various types of valuable materials, machineries and equipment.

Literature Review

Construction is the only one task in a production work in which the outcomes of the production process are static on the production floor. The following areas are considerable is 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 produced by the production firm are assembled and implemented on an dynamic environment; the structures of the production floor exists for a long time without changing and are flexible to modify in order to changing demand; rules and regulations of the firm has 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 present of the total cost of the project bares 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 is 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 in to where the information and the physical resources located in the past, there is no need to limit only to the urban areas in the present with the help of the technology and communication network developments. Those all implies the importance of the telecommunication infrastructure developments (Egan, 1996).

Warehouses place 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 the affecting 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 of 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.barcode sinc.com, 2013).

Research Problem

In construction field, warehouses do a great roll 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 an example, some of the materials required to maintain 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 & Rheobiuld 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 major cash outflow 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 above mentioned requirements, warehouses need to modify their processes which are currently practicing in the telecommunication infrastructure development sector warehouses to improve the effectiveness of the warehouse. 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 analysed to identify the affecting factors. Statistical tools such as correlation were carried out for the statistical analysis. 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 while covering all the fields which were identified with the help of the citations, observations and reports & summery generated by the store keepers so on.

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 was categorised according to the variables and their basic statistical behaviour was measured and given in Table 1.

Table 1 Related Statistics of Identified Variables

Variable	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 lickeret scale analysing on selected variables, environmental impacts was ranked as mostly affected factor for the warehouse efficiency. All the variables' significant was tested statistically and the results have given in Table 2.

Table 2 Variable's Significant

Variable	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 all the factors having significant behaviours towards warehouse effectiveness. But according to their impact, environmental impact due to materials/machineries is highly affected factor for the warehouse effectiveness. It means 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 other most largely, significantly encountered factors for warehouse effectiveness.

Though scrap management shows significant behaviour, according to the perception of the employees, Scrap Management is not affecting too much for the effectiveness of the warehouse. Similarly, waste management, space utilization and continuous maintenance are also not affecting too much 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. Demographic factors' that were used are;

- Employee Category
- Educational Level
- Service Duration

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

Description	t	Sig. (2-tailed)	Mean Difference
Employee Category	0.640	0.524	0.066
Educational Level	0.691	0.492	0.057
Service Duration	0.028	0.977	0.002

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

Description	t	Sig. (2-tailed)	Mean Difference
Employee Category	-8.205	.000	-0.663
Educational Level	-2.310	.023	-0.197
Service Duration	0.560	.577	0.056

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 carried out to identify the groups which showing such differences. The Analysis on those two factors is shown in Table 4.

Table 5: Group Statistics for Safety and Protection

Description		Mean	Standard Deviation
Employee Category	1	0.688	0.414
	2	1.352	0.257
Educational Level	>= 2	1.158	0.432
	< 2	1.355	0.260

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

Table 6 Independent Samples Test for Emergency Unloading

	t	Sig. (2-tailed)	Mean Difference
Employee Category	-3.247	0.002	-0.353
Educational Level	-1.197	0.235	-0.111
Service Duration	-1.040	0.301	-0.111

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 were given in Table 7.

Table 7 Group Statistics for Emergency Unloading

Description		Mean	Standard Deviation
Employee Category	1	0.625	0.341
	2	0.978	0.403

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

Results and Discussion

According to the above analysis, environmental impact due to materials/machineries was identified as most significantly and largely affected factor for the effectiveness of the warehouse. Interestingly, whatever the demographic group represents, all employees are having similar type of perception.

Safety and protection is another significant factor identified through this study. Even though, different groups of employees, based on their employee category and education level have shown significantly difference perception over warehouse effectiveness. Clear difference was identified in between executives and non-executive employees. While executives were agreeing on issues related safety and protection, non-executives were largely concerns its impact on effectiveness.

Also, identified third most affecting factor was emergency unloading. According to the employees' perception, this also largely affected for the warehouse effectiveness. Interestingly, significant difference perceptions were recorded according to the employee category. Non-executive employees were largely concern on this factors affect while executives were marginally concerned.

Conclusions

Through the findings of the study, it can be concluded that the "Environmental Impacts due to Materials/Machineries" is the most 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 minimize environmental impacts due to storing items. Thus, management should take necessary steps to eliminate all the related activities which have 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 which is the tools and equipment usage, very high. This can be done by making the working environment more safety, and providing awareness on machineries and working procedures. .

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.

As there were different perceptions among different groups of employees, management should focus and study on these areas to make things correct. As there was higher concern on mostly affected factors from non-executive employees, it is required

to have proper understanding among two employee categories to make the working environment much safer and affective to work. If all groups having similar perception, it will be easier to establish effectiveness in warehouses. Otherwise, it will not be worked out if there were any conflicts regarding the perceptions of the employees.

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