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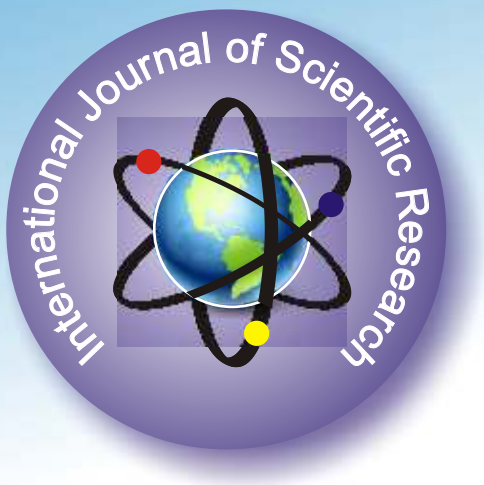

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Connotation Of Systematised Warehouse Management System In Supply Chain Of Small Scale Firms

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Abstract

Appropriate warehousing contributes to numerous benefits such as healthier protection of goods, improved profitability, improved customer service etc. The present study explores the benefits acquired by implication of systematised warehouse management system in 44 small scale units operating in district Udhampur of J&K State. The research framework was examined by empirical analysis of primary data collected. Validity and reliability of the scales in the construct were assessed through BTS and Cronbach-alpha. The results of ranking tables revealed that systematised warehousing ensures availability of goods in markets besides safety of goods & availability of stock all the times.

Keywords : Warehousing, Supply Chain, Small Scale Industries (SSIs)

Introduction

Warehouses are regarded as reservoirs that assist the firms in copiousness of ways as it helps in protecting the actual value of goods. Proper warehousing management in Supply Chain attributes for general sales growth by potential improvements in productivity, order accuracy, reduced space requirements, increased volume capacity, control of inventory and increased customer service (Tarn et al., 2003) "The efficiency and effectiveness in any distribution network in turn is largely determined by the operation of the nodes in such a network i.e. the warehouses". Reduction in material handling, increase accuracy levels, improvement in service consistency & availability, increase speed of service are the main decision criteria in warehousing management (Drury & Falconer, 2003). Customer service failings at the warehouse level can have significant impacts on companies in terms of sales & profits, market share, brand switching, competitive capabilities (Stalk et al., 1992) and picking efficiency (Gibson & Sharp, 1992). Warehousing management is defined as "the direct control of handling equipment producing movement and storage of loads without the need for operators or drivers" (Rowley, 2000).

Review Of Literature

The literature related to warehousing management in the context of supply chain is scarce, though few things quoted by eminent authors had been taken care of. Warehouses are the final point in the supply chain for order assembly, value added services and despatch to the customer. A survey of large warehouses in the United Kingdom indicated that over 50 per cent of the floor area is generally taken up by storage, with most of the remaining area being used for the associated goods-in, order picking, packing and despatch activities (Baker, 2004). De Koster et al. (2007) broaden the ambit of warehouses for storing or buffering products (raw materials, goods-in-process, finished products) at and between points of origin and points of consumption. The continuing importance of warehousing appears to warrant further research, particularly as the literature is somewhat equivocal in this subject. The present research deals in implication of systematised warehouse management system in supply chain of small scale firms in District Udhampur of J&K State.

Research Methodolgy

Sampling and data collection

The primary data for the study were collected from 44 functional manufacturing SSIs registered under District Industries Centre (DIC), Udhampur of J&K State sub-divided into ten lines of operation comprising cement (8), pesticide (3), steel (3), battery/lead/alloy (5), menthol (2), guns (2), conduit pipes (2), gates/grills/varnish (5), maize/atta/dal mills (3) and miscellaneous (11). Census method was used to elicit response from owners/managers of the SSIs. Information was collected by administering self developed questionnaire which comprised of general information ranking questions and 19 statements of warehousing management. The data collected was further analysed with the help of SPSS (Version 16.00) for purification, checking validity and reliability. Ranking tables were used to elicit meaningful responses from the data.

The Survey Instrument

The survey instrument was based on ranking and ordinal scale (5<---->1) ranging from 'strongly disagree' (1) to 'strongly agree' (5). The primary data were collected by making three to four visits for getting response from managers. The secondary information was collected from various sources namely books, empirical papers from online & hard copies of journals.

Reliability and validity of the instrument

Reliability: As evident from the Table 1.1, the alpha reliability coefficients for F_1 (0.833), F_2 (0.853) and F_3 (0.846) is higher than the criteria of 0.77 obtained by Gordon and Narayanan (1984) indicating high internal consistency. F_4 (0.631) is also at a minimum acceptable level of 0.50 as recommended by Brown et al. (2001) thereby obtaining satisfactory internal consistency.

Validity: The four factors obtained alpha reliability higher & equal to 0.50 and KMO value at 0.671which indicate significant construct validity of the construct (Hair et al., 1995).

Data Analysis And Interpratation

Factor analysis was applied to the collected data and the suitability of data was examined through Anti-image, KMO value (0.671), Bartlett's Test of Sphercity (456.51) (p-value = 0.000), Principal Component Analysis and Varimax Rotation (Dess et al., 1997 & Field, 2000).

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The process of R-Mode Principal Component Analysis (PSA) with Varimax Rotation brought the construct to the level of 18 statements out of 19 statements. Therefore, factor loadings in the final factorial design, are consistent with conservative criteria, thereby resulting into four-factor solution using Kaiser Criteria (i.e. eigen value ≥1) with 67.01% of the total variance explained, i.e. 18 items got grouped in four factors. The communality for 18 items ranged from 0.58 to 0.90, indicating moderate to high degree of linear association among the variables. The factor loadings range from 0.621 to 0.892 and the cumulative variance extracted ranges from 20.37 to 67.01 percent. The percentage of variance explained by each factor came out to be F_1 (20.37%), F_2 (18.94%), F_3 (17.93%), and F_4 (9.97%) and is displayed in the Table 1.1.

Table 1.2 evinces the significance of Systematised Warehouse Management System. The variables taken into consideration are "Minimum investment in inventory", "The correct stock is available", "Ensures availability of goods in markets", "The goods are kept safe" and "Warehouse capacity is economical". The variable "Ensures availability of goods in markets" is accorded first rank by almost all the firms except for battery/lead/alloy, menthol and those falling under miscellaneous due to low market share. The variable "The goods are kept safe" is given second rank, the variable "The correct stock is available" is ranked third, "Minimum investment in inventory" scored fourth rank followed by "Warehouse capacity is economical" with fifth rank. Thus, from the responses of managers, it can be inferred that warehouse management ensures availability of goods in markets and also assists in protecting the goods from uncertainties.

Table 1.3 avows the ranking of warehousing activities performed by managers' of SSIs. The different activities performed in descending order are "Receiving" (I), "Picking' (II), Storing (III), "Packing" (IV) and "Handling" (V). In the nutshell, each activity contributes a lot in proper warehousing management and control.

Conclusion

Effectual warehousing management in supply chain management paves way for proper storage and protection of goods, meeting timely demand of the market, ensuring unremitting supply of goods etc. The study revealed that systematised warehousing ensures availability of goods in markets besides safety of goods & availability of stock all the times. The findings of the study is limited to small scale industries of district Udhampur of J&K State, so results drawn cannot be generalized for medium or large scale industries functioning in other parts of country having dissimilar business environment.

Table 1.1: Results Showing Factor Loadings and Variance Explained After Scale Purification (Rotated Component Method) Regarding Warehousing Management

Factor-wise Dimensions	Mean	S.D	F.L	Eigen Value	Variance Explained %	Cumulative Variance %	Comm-unality	α
F1Competitive strength	**4.07**	**.379**		**6.021**	**20.373**	**20.373**		**.8333**
Handle multi-stockroom inventories	4.06	.397	.823				.791	
Space utilization & flexibility of arrangement	4.06	.333	.793				.710	
Ready availability of stocks	4.06	.333	.786				.750	
Outperforms competitors on customer service	4.13	.462	.664				.625	
Material deterioration and pilferage	4.04	.370	.638				.650	
F2 Enhanced preservation and control	**4.02**	**.391**		**2.438**	**18.940**	**39.313**		**.8533**
Complete storage to various items	4.00	.373	.892				.867	
Distribution of goods economically	4.02	.340	.862				.803	
Meets demands of consuming departments	4.04	.370	.857				.874	
Goodwill & invites business	4.04	.480	.624				.582	
F3 Effective purchase planning	**4.12**	**.391**		**1.769**	**17.732**	**57.045**		**.8464**
Supply timely goods to markets	4.15	.428	.788				.782	
Avoids unnecessary waiting time	4.06	.333	.783				.907	
Results in shorter path philosophy	4.06	.333	.780				.774	
Codification & preservation	4.11	.386	.681				.867	
Assists in effective purchase actions	4.22	.475	.621				.683	
F4 Overall cost reduction	**4.19**	**.499**		**1.388**	**9.970**	**67.015**		**.6317**
Reduces overall costs	4.06	.399	.815				.784	
Ensures smooth inflow & outflow of goods	4.31	.601	.671				.625	

Footnotes: KMO Value = .671; Bartlett's Test of Sphercity = 456.511, df = 136, Sig. =.000; Extraction Method Principal Component Analysis; Varimax with Kaiser Normalisation; Rotation converged in 9 iterations; 'FL' stands for Factor Loadings, 'S.D' for Standard Deviation and 'α' for Alpha.

Table 1.2: Unit-wise Ranking of Significance of Systematised Warehouse Management System

Units/Significance	Minimum investment in inventory	The correct Stock is available	Ensures availability of goods to markets	The goods are kept safe	Warehouse capacity is economical
Cement	4.1 (IV)	3.5 (III)	1.1 (I)	1.8 (II)	4.2 (V)
Battery/Lead/Alloy	4.5 (V)	3.5 (III)	1.6 (11)	1.4 (I)	4 (IV)
Pesticides/Insecticides	5 (V)	3.5 (IV)	1.6 (I)	1.6 (II)	3 (III)
Conduit pipes	5 (V)	3 (III)	1.5 (I)	1.5 (II)	4 (IV)
Menthol	3 (III)	3 (II)	3.5 (IV)	1 (I)	4.5 (V)
Guns	3 (III)	4 (IV)	1 (I)	2 (II)	5 (V)
Steel	4.6 (V)	3.6 (III)	1.3 (I)	1.6 (II)	3.6 (IV)
Gates/Grills/Varnish/Paint	3.6 (III)	4 (IV)	1.2 (I)	1.8 (II)	4.3 (V)
Atta/Maize/Dal mills	3 (III)	5 (V)	1 (I)	2 (II)	4 (IV)
Others (Miscellaneous)	3 (III)	3.2 (IV)	1.9 (II)	1.6 (I)	4 (V)
Mean & Rank	3.8 (IV)	3.6 (III)	1.5 (I)	1.6 (II)	4.06 (V)

Note: Where 1 denotes "highest rank" and 5 denotes "lowest rank"

Table 1.3: Unit-wise Ranking of Activities Performed in Warehouse Management by SSIs

Units/Activities	Receiving	Storing	Picking	Packing	Handling
Cement	1 (I)	3 (III)	2 (II)	4 (IV)	5 (V)
Battery/Lead/Alloy	1 (I)	3 (III)	2 (II)	4 (IV)	5 (V)
Pesticides/Insecticides	1.6 (I)	3 (III)	3.6 (IV)	2 (II)	4.6 (V)
Conduit pipes	1 (I)	3 (III)	2 (II)	4 (IV)	5 (V)
Menthol	1 (I)	3 (III)	2 (II)	4 (IV)	5 (V)
Guns	1 (I)	3 (III)	2 (II)	4 (IV)	5 (V)
Steel	1.3 (I)	3.3 (IV)	2.3 (II)	3 (III)	5 (V)
Gates/Grills/Varnish/Paint	1.4 (I)	3 (III)	1.8 (II)	4 (IV)	5 (V)
Atta/Maize/Dal mills	1.6 (I)	2.6 (III)	2.6 (II)	3 (IV)	5 (V)
Others (Miscellaneous)	1.5 (I)	2.7 (III)	2.3 (II)	3.2 (IV)	4.7 (V)
Mean & Rank	1.2 (I)	2.9 (III)	2.2 (II)	3.5 (IV)	4.9 (V)

Note: Where 1 denotes “highest rank” and 5 denotes “lowest rank”

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