Structural Relation amongst Components of Container Management, Effectiveness of Container Management and Supply Chain Management

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Abstract

The present study elucidates that significant difference exists amongst profile of respondents and container management. Time of schedule, strategic leadership, cost control and vessel capacities have positive and significant influence on supply chain management. In addition, cost control, vessel capacity, time of schedule and strategic leadership have significant, positive and direct influence on effectiveness of container management, while, effectiveness of container management has significant, positive and direct influence on supply chain management. Therefore, all the hypotheses are supported by the findings of the present study. Therefore, it is essential to develop a model capable of predicting the time of arrival for vessels, providing terminal planners with accurate information to facilitate optimal berth planning and the owners of containers must improve container operations by implementing integrated operations, optimizing system dynamics, utilizing information sharing systems, and deploying advanced technology and process optimization. Integrated operations of separate container can lead to reduced vessel waiting time, balanced utilization across terminals, and increased overall profits. The owners of containers should improve capacity utilization of their containers and they must build dense packs outside of the confines of a container and load/unload in a single shot and use machinery with smart technology to load as closely to the container walls as possible and also use optimization techniques. Besides, the owners of containers should charge rationally for their services on par with market and they must avoid extra or additional cost for maintaining their competitiveness and margins in profit. The owner of containers should concentrate on networking that has to be executed immediately and it will help to balance demand and supply and allocate various tasks to employees in the cost effective ways. The vessel capacity must be increased or fully utilized by means of switching to floor loading and packing containers without pallets. Furthermore, the owners of containers must effectively collaborate with supply chain partners that will improve their business operations.
Key Words: *Container Management, Effectiveness, Employees, Supply Chain Management.*

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1. INTRODUCTION

The logistics Industry in India is experiencing a incredible change driven by advancements of technologies and innovations in different domains warehousing, namely transportation and inventory management. Warehouse automation, tracking systems in real-time and the use of Artificial Intelligence (AI) is restructuring supply chain ecosystem in India and these transformations have let to improvement in operation capabilities, expansion of networks of suppliers and enhancement in delivery capacities. In addition, logistics industry in India has understood the significance of flexible and strong supply chains and many companies are exploring new and innovative solutions and clinch newer opportunities. The big ticket projects namely cargo terminals, dedicated freight corridors, port modernization and connectivity, industrial corridors and green field expressways are contributing significantly to the development of logistics sector in India. This industry is anticipated to touch over $450 billion by the year 2030, providing a host of opportunities for warehouse developers, logistics service providers, material and equipment suppliers and technology providers.

Road transportation is one of the most widely used modes in logistics, especially for short to medium distances. Trucks, vans, and other vehicles transport goods directly from the point of origin to the destination. Its flexibility allows for door-to-door deliveries, making it highly convenient for businesses and customers alike. However, road transportation is limited by road infrastructure, traffic congestion, and environmental concerns related to emissions.

Rail transportation is an efficient mode for moving large volumes of goods over long distances. Trains can carry heavy loads and operate on fixed tracks, reducing the chances of accidents. This model is cost-effective and suitable for transporting bulk commodities such as coal, minerals, and grains. Railways are an environmentally friendly option compared to road transport, but their reach is limited, often requiring additional road transportation for last-mile delivery.

When speed is of the essence, air transportation becomes indispensable. Freight planes can quickly transport goods across long distances and even internationally. This model is highly reliable and preferred for high-value and time-sensitive shipments like perishable goods, pharmaceuticals, and electronics. However, air transport can be expensive, making it less suitable for bulk cargo and economically challenging for some businesses.

Maritime transportation is the backbone of international trade, enabling the movement of goods between continents and countries. Cargo ships can carry vast quantities of goods, making it a cost-effective option for bulk shipments like crude oil, automobiles, and consumer goods. Although maritime transportation is slower than air freight, its affordability and eco-friendliness contribute to its continued popularity.

Inter modal transportation combines multiple modes of transport to optimize efficiency and cost-effectiveness. It involves transferring goods from one mode of transportation to another, seamlessly integrating road, rail, air, and maritime transport. This method allows for faster movement of goods over long distances and enhances the flexibility of logistics operations. Inter modal transportation requires precise planning and coordination to ensure smooth transitions and timely deliveries.

Pipeline transportation is specifically designed for the movement of liquids and gases, such as oil, natural gas, and water. It offers a safe, continuous, and cost-effective method for bulk

transportation, especially over long distances. Pipelines are highly efficient for industries that rely heavily on the transportation of liquids, reducing the dependency on other modes of transport. However, pipeline infrastructure is expensive to build and maintain, limiting its use to industries with high transportation demands for fluids.

Further, container freight transport is one of the most crucial components of the global transport chain and global material flow. It is a cost-effective, flexible, and integrable transport system. Depending on these relative advantages, container freight transport has increased its share in international transportation in recent years increasingly. Although the container freight transport system is growing worldwide, some structural problems need to be solved. Container companies might make mistakes in ship evaluation and selection processes, as a significant part of their vessel fleet can stay idle despite high and ever-increasing demands. It can be accepted as a managerial failure and weakness of these companies because of the administrative liability of container companies and structural problems existing in decision making processes. The larger container companies stay insufficient concerning meeting the unit transport costs, and container companies face some difficulties operating these vessels.

The most Influential phase of constructing the container transport system for container companies is to generate an effective and productive container vessel fleet by selecting appropriate vessels with volumes. However, choosing proper container vessel types is not easy for decision makers because many conflicting criteria affect the evaluation processes. Also, decision makers responsible for determining suitable container vessels may have to decide with a lack of data and insufficient information due to highly complicated uncertainties in assessment processes carried out for determining container vessels. Existing conflicting criteria and complex uncertainties make it difficult to decide for decision makers in the field of the maritime industry. Moreover, there are also many alternatives related to container vessels for practitioners. Thus, selecting an appropriate container ship type alternative is exceptionally difficult and time consuming for decision-makers and continuous increasing size and emergence of various types of containers are also major issues for operators and consumers.

The logistics industry in India is witnessing faster growth in the recent past years because of digitalization, reforms in policy measures, development of infrastructure facilities and use of improved technologies. The logistics market is having worth of $250 billion and it is anticipated to growth at the rate of 10-12 % per annum. Nearly one third of logistics costs in India is due to transport and storage associated inefficiencies. The government plans to bring down the logistics cost from around 13% of the GDP to 8% in the coming years. The warehousing industry is emerged with a rising focus on large and sophisticated warehouses in the last few years and significant institutional investments are taking place for owing to the buoyant demand from e-commerce, 3PL and FMCG and effective policy measures including infrastructure status to the logistics sector and the introduction of the National Logistics Policy.

Warehousing has become one of the major segments contributing to a rapidly growing Indian logistics industry. The growth in international trade and a rapid rise in containerization levels have led to high demand for warehouses and a tremendous opportunity for the private sector. The demand for specialized services is expected to further drive the growth in the market. Several initiatives have been taken by the Government towards the development of warehousing sector.

The introduction of Goods & Services Tax (GST) regime and Warehousing Act 2007, investments in logistics parks and Free Trade Warehousing Zones (FTWZs) have aided in the development of infrastructural facilities. The change in tax policy has had significant impact on investments by the logistics providers in warehousing segment and has opened the gates for large scale investments. There is tremendous competition between major private and public players in the market. The continued development of warehouse infrastructure will go a long way in providing the necessary support to the logistics industry. The infrastructure development in the warehouse segment is expected to get further fillip with the introduction of new regulatory and development bill.

The air transport sector's contribution has been around 0.20% of the country's GDP, while the transport sector's contribution to the GDP has been growing over the last couple of years. India's air cargo is predicted to grow at over 11.50% per year in the next few years. The contribution of the marine transport sector is also around 0.20% to the country's GDP. The sector's contribution to the GDP has been increasing mostly because of the growing economic developments in the country. The Indian Railways has realized the necessity to improve the infrastructure provide better service. The plan to develop logistics parks or hubs has the potential to streamline and optimize the supply chain and reduce the costs. Currently around 80% of the goods in India move by road, the railways has to essentially devise plans to divert this traffic to the rail.

India's logistics sector attracted huge investments, leaving behind some of the major sectors including aviation, metals and consumer durables. The growths in the retail and manufacturing industry, commodity markets and development of SEZs have been key factors in the growth of Indian logistics industry. A number of infrastructural projects involving warehouse and logistics parks are being undertaken are expected to be operational in the next 2-3 years.

The setting up Special Economic Zones (SEZs) has led to increased logistics activities around them. Several logistics parks have come up at locations like Mumbai, Kolkata, Chennai and Hyderabad because of their excellent port, rail and road connectivity and are witnessing significant investment in infrastructure. Many of the large logistics players are in the process of setting up warehouses, container freight stations (CFS), inland container depots (ICD), logistics parks, distribution centres and other facilities to leverage the abundant opportunities. Increase in foreign trade is expected to further accelerate the demand for logistics services.

India is strategically located on the world's shipping routes with a coastline of approximately 7,517 km. India owns over 30% global market share in the ship breaking industry and is home to the largest ship-breaking facility in the world at Alang. To promote India's shipping and port industry, the government has also introduced various fiscal and non-fiscal incentives for enterprises that develop, maintain and operate ports, inland waterways and shipping in India.

India has 12 major and 200 non-major/intermediate ports (under state government administration). Jawaharlal Nehru Port Trust is the largest major port in India, while Mudra is the largest private port. Jawaharlal Nehru Port becomes first 100% Landlord Major Port. Moreover, India is one of the world's top 5 ship recycling countries. Amongst the Major Ports, Deendayal Port handled the maximum Cargo of 137.56 million tonnes with a share of 17.6% followed by Paradip Port (17.3%), JNPA (10.7%), Visakhapatnam Port (9.4%), Mumbai Port (8.1%), Chennai Port (6.2%), SMP Haldia (6.2%), Kamarajar Port (5.6%), NMPA (5.3%), VOC Port

(4.8%), Cochin Port (4.5%), Mormugao Port (2.2%) and SMP Kolkata (2.1%) during April-March, 2022-23. The role of the shipping industry in the growth of Indian economy has been very significant and major ports in India together have handled around 500 million tones of cargo in the last two years and this figure is growing significantly.

The Indian shipping fleet is primarily dominated by crude and product tankers, accounting for the majority of the overall capacity at 57%. Dry bulk carriers follow at 16%, while container vessels make up approximately 5% of the fleet. Given that globally crude and product tankers are expected to outperform the container vessel segment and given the dominance of these vessel types in the Indian fleet, the Indian Shipping Industry is expected to maintain a steady performance in the coming years.

The growth of the country's container market is being fuelled by the rising demand for containerized commodities, development of container terminals and digitization in container shipping. The high dependence on imported containers continues to remain a cause of concern for Indian exporters. Domestic manufacturing of shipping grade containers requires significant push from the government to break China's monopoly in this space. Containers are the main carriers for transport of goods and are largely used for movement of goods at global and also domestic transportation through different modes of transport namely trains, ships and air (Braekers et al. 2011). The logistics activity is highly simplified because of standardization and managing of containerization and it is increasing economies of scale of operations (Karmelic et al. 2012). Container management is largely focusing on planning and management of operating aspects to meet requirements of customers (Rizaldi et al. 2015) by means of best utilization of vessel capacity of containers (Shibasaki et al. 2017) and it is providing dependable services for attaining higher degree of profit and reducing cost of operations of containers (Song and Dong, 2012) and elements of container management are influencing effectiveness of container management significantly.

Supply chain management is act of managing various relations among different players in supply chain that provides opportunities to hold inter and intra organization coordination along with the objective of attaining excellence in business activities in cooperation with different components of chain (Lambert and Cooper, 2000). It is the orderly and strategic cooperation among functions of business within and away from organizations (Rao and Goldsby, 2009) and it aims at increasing performance and productivity of organizations (Blos et al. 2009) and it also comprises of different activities that is related with various operations of organizations (Boyson, 2014). It is including a group of multiple activities dealing all kind of features of functions (Pfohl et al. 2011) and their interdependencies of organizations (Trkman and McCormack, 2009).

Supply chain management is essential for effectively managing complications and various events associated with operations of organizations (Wu et al. 2013) and it is maintaining relations among partners in supply chain (Scannell et al. 2013). The proper management of containers is playing a significant role in supply chain and it is the reality that containers are operated by various kinds of modes of transport (Seo et al. 2015) and types of equipment related with handling and amenities from starting place to end destination along with the whole route of supply chain. However, there is no study is done relating to structural relation amongst components of

container management, effectiveness of container management and supply chain management in South India. Hence, this research is carried out in South India of India to fill a research gap.

2. THEORETICAL BACK GROUND

2.1 Container Management and Supply Chain Management

Vessel capacity, time of schedule, cost control and strategic leadership are the important components of container management. Vessel capacity is the capacity of vessel in terms of grain or bale capacity of containers to carryout cargo and or other materials (Haralambides, 2019). Vessel capacity is playing an important role in transport of cargo or materials from and in to port terminals (Kyu and Suh, 2019). Vessel capacity is determining quantum of cargo carried out and transported to various places form ports and it is having significant impact on storage and maintenance of materials (Cullinane and Khanna, 2000) and it is affecting productivity and efficacy of containers and they were moving through various transport modes (Tran and Haasis, 2015). The size of economies of scale of logistics operations is highly depending on vessel capacity of containers (Haralambides et al. 2002) and it is also influencing cost saving operations of shipment and logistics operations. The capacity of vessel is having influence on supply chain management (Mankowska et al. 2020).

Time of schedule is allocation of time for carrying out operations of containers (Song, 2012) and it is deciding plan and time of operation of containers and selecting alternative plan (Wang and Meng, 2012) and it is affecting various actions of networking and services to customers (Yin et al. 2011). Time of schedule is affecting departure and arrival timings of shipments in a systematic and planned manner (Wang et al. 2014). Time of schedule is pre planned activity that affects proper and accurate movement of cargo or materials in time (Salido et al. 2011) to reach customers and it is reduces overall cost of operations of containers and smoothens movement of goods from one place to another place and it is highly affecting supply chain management (Husein et al. 2021).

Cost control is the various practices for finding and decreasing cost related to operations and increasing profit of operations of containers (Chen et al. 2018). The effective control of cost is decreasing expenses associated with operations and functions of containers (Daehy et al. 2019) and it is also affecting management and maintenance of stock transported through containers (Santos et al. 2016). Cost control is influencing transportation and delivery of materials in time to customers (Lukinskiy et al. 2015). Cost control is an important method for increasing cost efficiency and optimum use of various resources related to operations of containers (Pettersson and Segerstedt, 2013) and it is also impacting profitability and supply chain management (Hofmann and Bosshard, 2017). Cost control is significantly influencing supply chain management (Alglawe et al. 2019; Rødseth et al. 2023).

Strategic leadership is the capacity to foresee, visualize, flexible and give powers to other players for creating strategic transformation if essential (Davies and Davies, 2014) and it is influencing process and assisting management of containers for improving performance to attain their goals (Bass, 2007). It is also influencing taking effective decisions for long term perspectives (Tutar et al. 2011) and it is also influencing sustainable competitive advantages. Future economic prosperity of the world is purely dpends on the maritime industry (Thiruvasagam and Vettriselvan, 2021;

Vettriselvan and Vinodhan, 2022). Strategic leadership is also effectively managing uncertain evens and activities of containers caused by considerable changes (Dess and Lumpkin, 2013) and it is also associated with efficient operations of containers (Kiyak et al. 2011) and it is also affecting supply chain management (Lear, 2012).

2.2 Container Management and Effectiveness of Container Management

Container management is also having significant and positive relation with effectiveness of container management (Yeo, 2010; Le-Griffin et al. 2011; Dan et al. 2013; Nyema, 2014; Carine, 2015; Shariff et al. 2017; Ech-Cheikh et al. 2021; Blazina et al. 2022; Moschovou and Kapetanakis, 2023).Vessel capacity (Meng et al. 2014), time of schedule, cost control and strategic leadership have positive and significant influence on effectiveness of container management (Mwisila and Ngaruko, 2018; Paing and Prabnasak, 2019; Jovic et al. 2022).

2.3 Effectiveness of Container Management and Supply Chain Management

Effectiveness of container management is having positive and significant relation with supply chain management (Wang and Cullinane, 2006; Roso and Lumsden, 2010; Muñuzuri et al. 2016; Shariff et al. 2017; Dias et al. 2019; Notteboom et al. 2020; Zhang et al. 2021)it has positive and significant influence on supply chain management (Lam andYap, 2011; Karthigeyan and Muthuraman, 2017; Song 2021). Through the above literature review, it is found that there is no study carried out on structural relation amongst components of container management, effectiveness of container management and supply chain management.

3. RESEARCH QUESTIONS

[i] To what extend the components of container management are influencing supply chain management?

[ii] How the components of container management are structurally related with supply chain management with moderating effect of effectiveness of container management?

4. HYPOTHESES OF THE STUDY

With the above theoretical background, the hypotheses are formulated and administrated for testing and they are:

H_1: Vessel capacity is positively influencing supply chain management.

H_2: Time of schedule is positively influencing supply chain management.

H_3: Cost control is positively influencing supply chain management.

H_4: Strategic leadership is positively influencing supply chain management.

H_5: Vessel capacity is positively and directly influencing supply chain management with moderating effect of effectiveness of container management.

H_6: Time of schedule is positively and directly influencing supply chain management with moderating effect of effectiveness of container management.

H_7: Cost control is positively and directly influencing supply chain management with moderating effect of effectiveness of container management.

H_8: Strategic leadership is positively and directly influencing supply chain management with moderating effect of effectiveness of container management.

5. METHODOLOGY

South India had selected for carrying out the present study and descriptive research design had employed for this study. Random sampling method had adopted to choose employees working in container operations in South India. The structured questionnaire had distributed among 950 employees working in container operations in South India and after careful examination of questionnaire, 320 usable questionnaires were considered and used in the analysis. The structured questionnaire had constructed on the basis of earlier studies and statements related to different components of container management, effectiveness of container management and supply chain management. Descriptive statistics, ANOVA test, correlation and regression analysis and Structural Equation Model (SEM) had used for analyzing the collected data from respondents. The research model is shown in Figure-1.
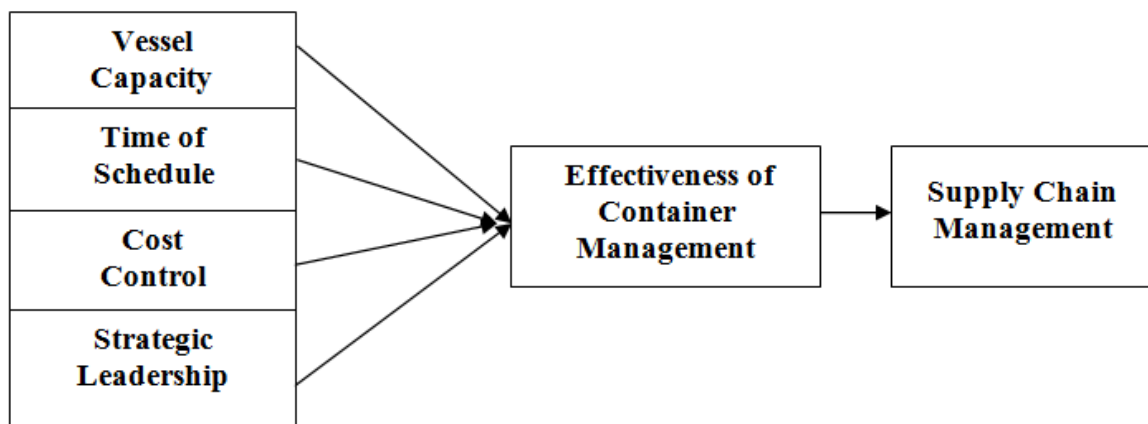

Figure 1: Research Model

6. DATA ANALYSIS

6.1 Background Information of Employees

With respect to age, 138 (43.12%) of employees are in 36-45 years, 94 (29.38%) are in 26-35 years, 64 (20.00%) are in more than 45 years and 24 (7.50%) are in less than 25 years. Regarding to educational level, 121 (37.81%) of them are having secondary, 85 (26.57%) are having diploma, 81 (25.31%) are having higher secondary and 33 (10.31%) are under graduates and 115 (35.94%) are having income between Rs.15,001 and Rs.20,000, 89 (27.81%) are having income between Rs.20,001 and Rs.25,000, 64 (20.00%) are having income of below Rs.15,000 and 52 (16.25%) are having income of above Rs.25,000 per month.

6.2 Confirmatory Factor Analysis

The results of Confirmatory Factor Analysis (CFA) are shown in Table 1. The composite reliability for components of container management and supply chain management is larger than 0.70, average variance extracted is greater than 0.50 and discriminant validity is higher than 0.60 showing that convergent validity is confirmed for all the measures in the study.

Table 1: Results of Confirmatory Factor Analysis

Constructs	CR	AVE	DV
Vessel Capacity	0.77	0.68	0.66
Time of Schedule	0.76	0.66	0.64
Cost Control	0.80	0.69	0.67
Strategic Leadership	0.74	0.65	0.63
Effectiveness of Container Management	0.79	0.72	0.68
Supply Chain Management	0.72	0.64	0.61

From the above table, it is observed that composite reliability for constructs is greater than 0.70, average variance extracted is higher than of 0.50 and discriminant validity is larger than 0.60 showing that convergent validity is excellent for constructs included in this study.

6.3 Descriptive Statistics of Constructs
The findings elucidate that relation among constructs is moderate in general and significant in 1% level. The higher degree of relation is there among effectiveness of container management and supply chain management and it is positive and significant in 1% level (r = 0.64). In addition, all the constructs are positively and significantly inter related among them in 1% level (Table 2). If the correlation coefficient is equal to or higher than 0.80, it is creating the problem of multicollinearity and in this case all correlation co-efficients are smaller than 0.80, the problem of multicollinearity does not prevail among constructs taken in this study and it is checked through VIF for all the independent variables and they show that multicollinearity is not prevailing since VIF values are less than 2.

Table 2: Descriptive Statistics and Correlation Coefficients

Constructs	M	SD	1	2	3	4	5	6
1. Vessel Capacity	3.84	0.41	1					
2. Time of Schedule	3.68	0.53	0.26**	1				
3. Cost Control	3.80	0.48	0.31**	0.38**	1			
4. Strategic Leadership	3.76	0.46	0.25**	0.33**	0.20**	1		
5. Effectiveness of Container Management	3.86	0.42	0.34**	0.36**	0.39**	0.41**	1	
6. Supply Chain Management	3.94	0.52	0.42**	0.53**	0.48**	0.34**	0.64**	1

** Significant in 1% level

6.4 Difference between Profile of Employees and Container Management
The ANOVA test is applied to study difference between profile of employees and container management and the outcomes are shown in Table 3.

Table 3: Outcomes of t and ANOVA tests

Profile	M	SD	F-Value	Sig.
Age				
Less than 25 years	63.23	5.10		
26-35 years	65.36	4.74	6.224	.000
36-45 years	67.08	3.75		
More than 45 years	65.68	4.56		
Education				
Secondary	62.88	5.32		
Higher Secondary	64.15	4.51	7.090	.000
Diploma	65.75	4.53		
Under Graduation	67.33	5.07		
Monthly Income				
Below Rs.15,000	63.53	4.19		
Rs.15,001- Rs.20,000	64.28	4.94	5.100	.001
Rs.20,001- Rs.25,000	68.38	4.90		
Above Rs.25,000	63.96	4.78		

Employees belonging to 36-45 years, holding under graduation and having income of Rs. 20,001-Rs. 25,000 per month opined that container management is better. The F-values are elucidating that there exists significant disparity in container management amid profile of employees.

6.5   Influence of Components of Container Management on Supply Chain Management
Regression analysis is employed to study influence of components of container management on supply chain management and the results are shown in Table 4.

Table 4: Results of regression analysis

Particulars	Regression co-efficient (Unstandardized)	t-Value	Sig.
Constant	1.129	12.762	.018
Vessel Capacity	.278	4.294	.000
Time of Schedule	.982	10.050	.000
Cost Control	.405	5.605	.000
Strategic Leadership	.526	6.714	.000
R Squared	0.78	-	-
Adjusted R Squared	0.76	-	-
F-Value	272.825	-	.000

The model is significant in 1% level (R Squared = 0.78; Adjusted R Squared = 0.76; F = 272.825) and it explains that 76.00% of variation in supply chain management is contributed by components of container management. Time of schedule, strategic leadership, cost control and vessel capacity have positive and significant influence on supply chain management in 1% level. Keeping other variables constant, 1% increase in time of schedule, there will be 0.98% increase in supply chain management, 1% increase in strategic leadership, there will be 0.53% increase in supply chain management, 1% increase in cost control, there will be 0.41% increase in supply chain management and 1% increase in vessel capacity, there will be 0.28% increase in supply chain management.

6.6 Structural Relation among Components of Container Management, Effectiveness of Container Management and Supply Chain Management

The Structural Equation Model (SEM) is built to study structural relation among components of container management, effectiveness of container management and supply chain management and the outcome is shown in Table 5.

Table 5: Structural Path Coefficients- Standardized

Path	Coefficients (Standardized)	CR	P-Value
ECM ← VC	.512	8.135	***
ECM ← TS	.467	7.682	***
ECM ← CC	.591	8.958	***
ECM ← SL	.409	6.746	***
SCM ← ECM	.623	11.724	***

The SEM shows that the standardized coefficient for Effectiveness of Container Management (ECM) against Vessel Capacity (VC) is 0.512, the standardized coefficient for Effectiveness of Container Management (ECM) against Time of Schedule (TS) is 0.467, the standardized coefficient for Effectiveness of Container Management (ECM) against Cost Control (CC) is 0.591 and the standardized coefficient for Effectiveness of Container Management (ECM) against Strategic Leadership (SL) is 0.409 and these are significant I % level. Thus, cost control, vessel capacity, time of schedule and strategic leadership have significant, positive and direct influence on effectiveness of container management in 1% level

Besides, the standardized coefficient for Supply Chain Management (SCM) against Effectiveness of Container Management (ECM)is 0.623 which is significant in 1% level. Hence, effectiveness of container management has significant, positive and direct influence on supply chain management in 1% level. The path diagram for supply chain management is shown in Figure-2. The Chi-square value is 4.358 and it is not significant explicating that the model is in good fit. GFI is 0.98 and CFI is 0.96 and these measures are explaining that the model is in good fit. RMR is 0.09 and RMSEA) is 0.07 and these values are illustrating the model is in good fit.
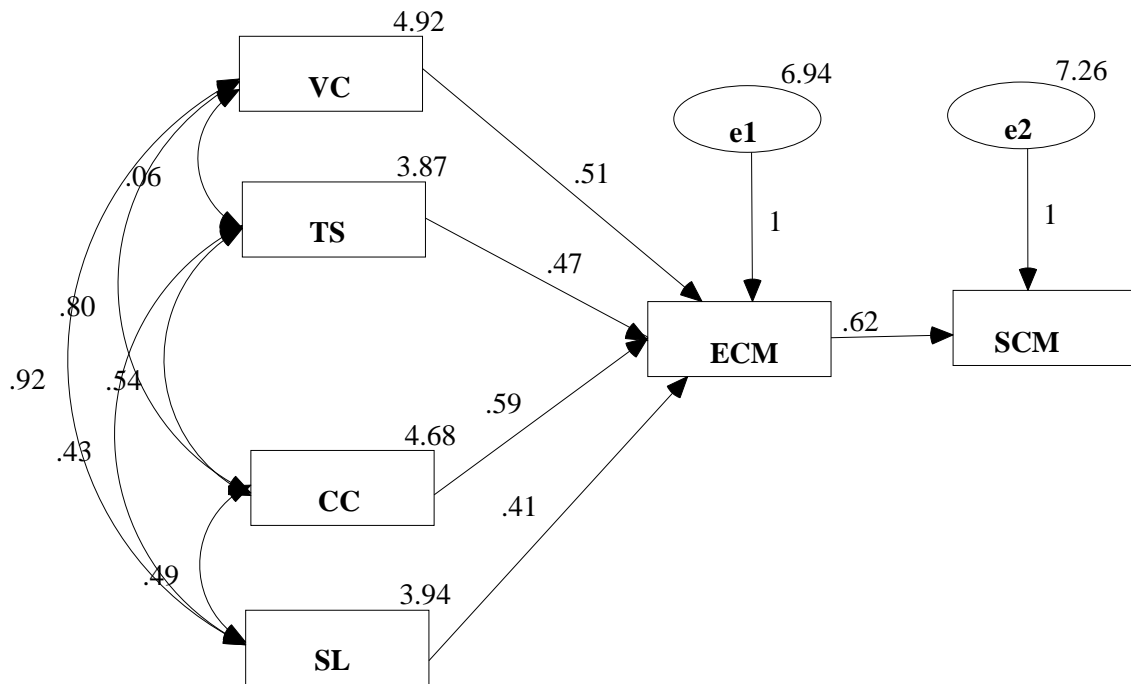
Figure 2: Path Diagram for Supply Chain Management

7. DISCUSSIONS

The outcomes of this research elucidate that time of schedule, strategic leadership, cost control and vessel capacity have positive and significant influence on supply chain management and these findings are confirmed by the studies of Mankowska et al. (2020) as vessel capacity, Husein et al. (2021) as time of schedule, Alglawe et al. (2019) and Rødseth et al. (2023) as cost control and Lear (2012) as strategic leadership have positive and significant influence on supply chain management. Furthermore, cost control, vessel capacity, time of schedule and strategic leadership have significant, positive and direct influence on effectiveness of container management, while, effectiveness of container management has significant, positive and direct influence on supply chain management and no previous studies are carried out in these aspects and it is also unique in these aspects.

8. CONTRIBUTIONS AND IMPLICATIONS

This study makes a considerable contribution to the prevailing literature by analyzing influence of components of container management on supply chain management and structural relation among components of container management, effectiveness of container management and supply chain management. This study also gives important ideas for management or owners of containers with highlighting the significance of improving effectiveness of container management

and also for improving supply chain management because effectiveness of container management and supply chain management are highly imperative to enhance operational efficiency, competitiveness and profitability of operations of containers. This study also provides an empirical confirmation for influence of components of container management on supply chain management and structural relation among components of container management, effectiveness of container management and supply chain management.

9. CONCLUSION, SUGGESTIONS, LIMITATIONS AND DIRECTION FOR FURTHER RESEARCH

The above analysis explicates that significant difference exists amongst profile of respondents and container management. Time of schedule, strategic leadership, cost control and vessel capacities have positive and significant influence on supply chain management. In addition, cost control, vessel capacity, time of schedule and strategic leadership have significant, positive and direct influence on effectiveness of container management, while, effectiveness of container management has significant, positive and direct influence on supply chain management. Therefore, all the hypotheses are supported by the findings of the present study. Therefore, it is essential to develop a model capable of predicting the time of arrival for vessels, providing terminal planners with accurate information to facilitate optimal berth planning and the owners of containers must improve container operations by implementing integrated operations, optimizing system dynamics, utilizing information sharing systems, and deploying advanced technology and process optimization. Integrated operations of separate container can lead to reduced vessel waiting time, balanced utilization across terminals, and increased overall profits. The owners of containers should improve capacity utilization of their containers and they must build dense packs outside of the confines of a container and load / unload in a single shot and use machinery with smart technology to load as closely to the container walls as possible and also use optimization techniques. Besides, the owners of containers should charge rationally for their services on par with market and they must avoid extra or additional cost for maintaining their competitiveness and margins in profit. The owner of containers should concentrate on networking that has to be executed immediately and it will help to balance demand and supply and allocate various tasks to employees in the cost effective ways. The vessel capacity must be increased or fully utilized by means of switching to floor loading and packing containers without pallets. Furthermore, the owners of containers must effectively collaborate with supply chain partners that will improve their business operations. The present study is limited to employees working in container operations in South India and the sample size is also limited to 320 only. The future research may be taken as supply chain integration as a mediator among components of container management and performance of supply chain management at different ports in South India and also in other regions of India and the nation as a whole.

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