OPEN ACCESS

Global Journal of Research in Humanities & Cultural Studies
ISSN: 2583-2670 (Online)
Volume 04 | Issue 02 | March-April | 2024
Journal homepage: https://gjrpublication.com/gjrhcs/

Original Research Article

# Implication in Adoption of Hub and Spoke Distribution Model in Domestic Logistics Operations with Special Reference to Coimbatore City

[1]Dr.V.Saranya, [2]Mr. Abdul Nafih*, [3]Mr. Nithis N

[1]Assistant Professor, Department of International Business, Dr.N.G.P Arts and Science college, Coimbatore, India.
[2,3]B.com (IB), Department of International Business, Dr.N.G.P Arts and Science College, Coimbatore, India.

**DOI: 10.5281/zenodo.10936336** **Submission Date: 19 March 2024 | Published Date: 06 April 2024**

***Corresponding author: Mr. Abdul Nafih**
B.com (IB), Department of International Business, Dr.N.G.P Arts and Science College, Coimbatore, India.

## Abstract
The logistics industry in India plays a pivotal role in facilitating the movement of goods and services across the nation, serving as the backbone of its economic infrastructure. In recent years, the adoption of innovative distribution models has become essential for enhancing efficiency, reducing costs, and meeting the evolving demands of consumers. One such model gaining traction is the Hub and Spoke Distribution Model, which offers a structured approach to streamline logistics operations. This paper focuses on the applicability and benefits of the Hub and Spoke Distribution Model in domestic logistics operations in India, with a specific case study of Coimbatore. Coimbatore, known for its vibrant industrial landscape and strategic location, presents unique challenges and opportunities for logistics stakeholders in India. This study aims to analyse the scope, challenges, and advantages of adopting the Hub and Spoke Distribution Model in domestic logistics operations in India, with a focus on Coimbatore. Through a comprehensive examination of this model's implications, logistics stakeholders can navigate the complexities of the Indian market while unlocking new avenues for sustainable development and prosperity.

**Keywords:** Hub and Spoke Distribution Model, logistics operations, supply chain efficiency.

# INTRODUCTION
The logistics industry plays a pivotal role in facilitating the movement of goods and services across various regions, serving as the backbone of global trade and commerce. In recent years, the adoption of innovative distribution models has become imperative for enhancing efficiency, reducing costs, and meeting the evolving demands of consumers. One such model gaining traction is the Hub and Spoke Distribution Model, which offers a structured approach to streamline logistics operations. The Hub and Spoke Distribution Model presents an opportunity for organizations to optimize their supply chain networks, particularly in regions like Coimbatore, which serve as crucial economic hubs in India. Coimbatore, known for its vibrant industrial landscape and strategic location, presents unique challenges and opportunities for logistics stakeholders.

The adoption of the Hub and Spoke Distribution Model in domestic logistics operations, with a special focus on Coimbatore, holds immense potential for optimizing supply chain efficiency, reducing costs, and driving economic growth. By leveraging this model effectively, logistics stakeholders can navigate the complexities of the modern business **landscape while unlocking new avenues for sustainable development and prosperity.**

## OBJECTIVES OF THE STUDY
- To study the scope of adopting hub and spoke distribution model.
- To analysis various challenges that a related to domestic transport operation in order to adopt hub and spoke distribution model.

## RESEARCH METHODOLOGY

Employing a mixed-methods approach, this study combines qualitative and quantitative methodologies. Qualitative methods like interviews and focus groups delve into stakeholders' perceptions, while quantitative methods such as surveys gauge adoption rates and effectiveness.

## AREA OF THE STUDY

This is descriptive in nature. The research is to find the adoption of hub and spoke distribution model in domestic logistics operations in logistics industry.

## DESCRIPTIVE STUDY

A descriptive study involves formulating the objective of the study, defining the population and selecting a sample, designing the method of the data collection and analysis of data and result. The method of study is descriptive in nature.

## NATURE AND SOURCE OF DATA

- This study is based on a questionnaire method.
- Primary data has been collected from the logistics services industry in Coimbatore.
- Secondary data was collected from journals, websites, newspaper, and magazine.

## METHOD OF DATA COLLECTION

The data has been used which is collected through questionnaire. The researcher has used primary data conducted only in Coimbatore city.

## PRIMARY DATA

The primary data have been collected through a structured questionnaire. The questionnaires were distributed to 103 logistics services industries in Coimbatore.

## SECONDARY DATA

Secondary data have been collected from various sources and other research namely journals, websites, newspaper, and magazine.

## SAMPLE SIZE

Sample size is 103.

## STATISTICAL TOOLS USED

The following tools have been used to analyse the primary data

- Rank Analysis
- ANOVA
- Simple percentage analysis

## REVIEW OF LITERATURE

**Browning, J. (2003)**. The ability of a region to move people, products, and materials efficiently within the system—from point to point within the system, from supplier to customer through the various levels of the supply chain, or from origin to destination—will determine its growth and prosperity in the twenty-first century. Future planning concentrates on developing a region's infrastructure and intermodal transportation system, connecting it to other economies, and creating logistics facilities and institutions. In response to China's rapidly evolving economy and society, an unprecedented quantity of new, contemporary infrastructure, including highways, ports, airports, logistics parks, and warehouses, is being constructed.

**Lemoine, W., & Dagnæs, L. (2003).** Essay examines the dynamics of the globalization and internationalization of logistics and freight-forwarding service providers. To demonstrate the procedure, a case study based on E. ON, Stinnes, Schenker, BTL, and other European and non-European companies is given. The firms under investigation have revealed their organizational structure and strategies for growing their business on a European, international, and worldwide scale. The Internet was used as a research instrument to collect the data. The emphasis is on the business strategies and organizational pathways that the companies use to extend their operations beyond their home base.

**Pettit, S. J., & Beresford, A. K. C. (2005).** By moving aggregated flows to modes that are better suited for handling large volumes (rail, barge, coastal shipping), collaborative hub networks can help meet the need to reduce logistics costs and maintain logistics service levels while achieving economies of scale. The trend toward industry globalization,

smaller shipments, higher frequencies, and flow fragmentation has all enhanced the need for this. An intermodal hub network can be created by combining the necessary synchronization between costly but quick and flexible modes of transportation and less expensive but sluggish and rigid means through cooperation. Based on the literature on many-to-many hub network design, this paper explains the reasoning behind these collaborative hub networks. Presenting the findings explains the resulting methodology.

**Groothedde, B., Ruijgrok, C., & Tavasszy, L. (2005).** The idea of port regionalization expanded on previous geographic models of port growth by emphasizing the institutional dynamics that control the intricacy of inland linkages. By evaluating the literature on the three main facets of the concept—intermodal terminals, inland logistics, and collective action issues—this paper discusses the role of intermodal transport in port regionalization. The findings show that there is frequently a strategic clash between landside actors developing inland terminals and port actors (either port authorities or terminal operators). Although it is challenging for port actors to operate outside of the port's boundaries, certain port terminal operators have started to show that they.

## ANALYSIS AND INTERPRETATION
## 1.1 RANK ANALYSIS

### 1.1.1Opertation

| Particular | Mean | Rank |
|---|---|---|
| Hub and spoke model contribute to operational efficiency in domestic logistics | 6.5185 | I |
| I am confident that the hub-and-spoke model is a suitable distribution strategy for domestic logistics. | 4.6420 | II |
| Hub-and-spoke model enhances the reliable of deliveries in domestic logistics. | 4.0988 | III |
| The implementation of the hub-and-spoke model positively impacts the timeliness of deliveries. | 4.0370 | IV |
| Hub-and-spoke enhance the reliability of deliveries in domestic logistics | 3.8889 | V |
| Ensuring compliance with industry standards and regulations was a major obstacle in the adoption of the Hub and Spoke model. | 3.7901 | VI |
| Regulatory requirements posed significant challenges during the adoption of the Hub and Spoke model. | 3.6914 | VII |

## INTERPRETATION
The table presents responses on various aspects of the hub-and-spoke model's effectiveness in domestic logistics. It indicates a high mean score of 6.52 for operational efficiency, suggesting a widespread perception of its positive impact. Confidence in the model as a suitable distribution strategy is moderately high, with a mean score of 4.64. Additionally, the model is seen to enhance the reliability and timeliness of deliveries, with mean scores of 4.10 and 4.04, respectively. However, challenges related to regulatory compliance are also noted, with mean scores ranging from 3.69 to 3.79, indicating significant obstacles in this regard.

### 1.1.2 Infrastructure

| Particular | Mean | Rank |
|---|---|---|
| The hub-and-spoke model contributes to better inventory management in domestic logistics. | 4.4691 | I |
| Resource constraints, such as manpower and equipment shortages, hindered our organization's ability to fully adopt the Hub and Spoke model. | 4.3827 | II |
| Resource limitations, such as manpower and equipment shortages, hindered our organization's ability to adopt the Hub and Spoke model effectively. | 4.2716 | III |
| Infrastructure investment poses a significant challenge when implementing a hub and spoke distribution model | 4.1728 | IV |

| | | |
|---|---|---|
| Inadequate infrastructure posed challenges to the effective implementation of the Hub and Spoke model. | 3.7901 | V |
| Employees within our organization were resistant to the changes brought about by the adoption of the Hub and Spoke model. | 3.7654 | VI |

## INTERPRETATION

The table reflects opinions gathered from respondents regarding the hub-and-spoke model's implementation in domestic logistics. It suggests a general consensus on the model's positive impact on inventory management, with a mean score of 4.47. However, challenges such as resource constraints (mean scores ranging from 4.17 to 4.38), infrastructure investment (mean score of 4.17), and employee resistance (mean score of 3.77) are also highlighted. These values collectively indicate a recognition of the model's benefits alongside practical obstacles that need to be addressed for its successful integration.

## 1.2 ANOVA

**H0:** There is no different between Distribution model & information connectivity.
**H1:** There is a different between Distribution model & information connectivity.

### 1.2.1 Distribution model & information connectivity

| ANOVA | | | | | |
|---|---|---|---|---|---|
| | Sum of Squares | df | Mean Square | F | Sig. |
| Between Groups | 16.301 | 2 | 8.150 | 4.403 | .016 |
| Within Groups | 122.184 | 66 | 1.851 | | |
| Total | 138.485 | 68 | | | |

## INTERPRETATION

The significant value is 0.016, it is less than 0.050. Hence, we reject the null hypothesis. It was concluded that there is an association between Distribution model & information connectivity.

**H0:** There is no different between Customer base & information connectivity.
**H1:** There is a different between Customer base & information connectivity.

### 1.2.2 Customer base & information connectivity

| ANOVA | | | | | |
|---|---|---|---|---|---|
| | Sum of Squares | df | Mean Square | F | Sig. |
| Between Groups | 16.528 | 3 | 5.509 | 2.936 | .040 |
| Within Groups | 121.957 | 65 | 1.876 | | |
| Total | 138.485 | 68 | | | |

## INTERPRETATION

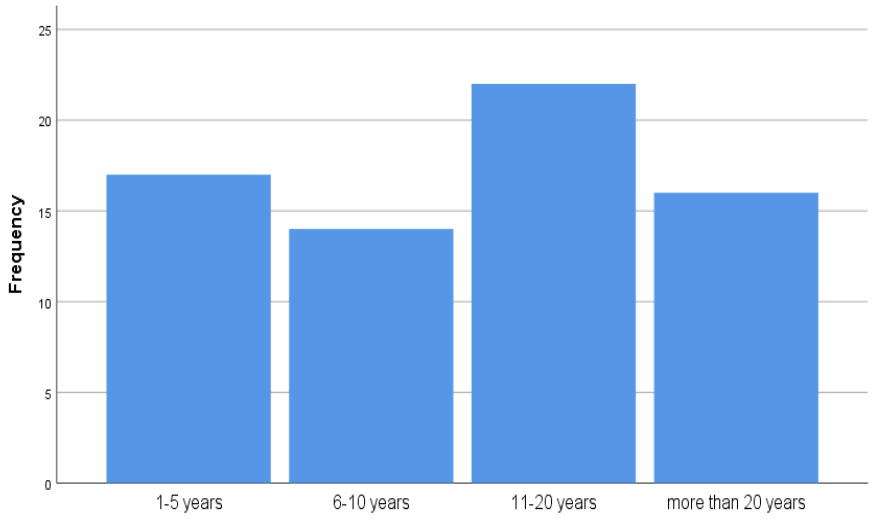
The significant value is 0.040, it is less than 0.050. Hence, we reject the null hypothesis. It was concluded that there is an association between Customer base & information connectivity.

## 4.3 SIMPLE PERCENTAGE ANALYSIS

### Table 4.3.1 years of experience

| S.no | Particular | Frequency | Percent |
|---|---|---|---|
| 1 | 1-5 years | 17 | 24.6 |
| 2 | 6-10 years | 14 | 20.3 |
| 3 | 11-20 years | 22 | 31.9 |
| 4 | more than 20 years | 16 | 23.2 |
| | Total | 69 | 100.0 |

**Chart 4.3.1 years of experience**




## INTERPRETATION

The data illustrates a diverse range of business maturity among surveyed companies. About a quarter are relatively new (1-5 years), while another significant portion has operated for 11-20 years (31.9%). A notable 23.2% have surpassed the two-decade mark, indicating seasoned players. This distribution suggests a mix of emerging ventures and well-established entities across various stages of market tenure.

## FINDINGS

This Ranking method analysis presents data collected from respondents regarding the effectiveness, challenges, and perceptions surrounding the implementation of the hub-and-spoke model in domestic logistics across several dimensions: operation and infrastructure. Here's a breakdown of the interpretation and results:

1. **Operation:**
   - i) The hub-and-spoke model is perceived to significantly contribute to operational efficiency, with a mean score of 6.52 out of 10.
   - ii) Confidence in the model as a suitable distribution strategy is moderately high, with a mean score of 4.64.
   - iii) It enhances the reliability and timeliness of deliveries, scoring 4.10 and 4.04 respectively.
   - iv) However, challenges related to regulatory compliance are noted, with mean scores ranging from 3.69 to 3.79.
2. **Infrastructure**
   - i) The model is seen positively in improving inventory management, scoring 4.47 out of 5.
   - ii) Challenges such as resource constraints, infrastructure investment, and employee resistance are highlighted, with mean scores ranging from 3.77 to 4.38.

The provided analysis presents the results of several ANOVA tests conducted to examine potential differences between different factors within the studied groups. Let's break down each ANOVA test and its interpretation:

1. **Distribution Model & Information Connectivity:**
   Result: Significant differences are found among the groups regarding information connectivity ($p = .016$).
   Meaning: The type of distribution model significantly affects information connectivity within the studied groups.
2. **Customer Base & Information Connectivity:**
   Result: Significant differences are found among the groups regarding information connectivity ($p = .040$).
   Meaning: The composition of the customer base significantly influences information connectivity within the studied groups.

This Simple percentage analysis provides insights into the characteristics and preferences of logistics companies based on simple percentage analysis:

**Years in Operation:**

- i) The data shows a diverse range of business maturity among surveyed companies.
- ii) A significant portion of companies (31.9%) has operated for 11-20 years, indicating established players.
- iii) About a quarter (24.6%) are relatively new (1-5 years), suggesting a mix of emerging ventures and well-established entities.
- iv) A notable 23.2% have been in operation for more than 20 years, indicating seasoned players in the market.

## SUGGETIONS

### HUB and Spoke distribution:

- **Establish Common Hubs:** Collaborate with stakeholders in the logistics industry to identify strategic locations for common hubs that can serve as central points for the distribution network. These hubs should be strategically located to optimize transportation routes and minimize transit times.
- **Facilitate Connection between Private Hubs and Lorry Associations:** Encourage partnerships and cooperation between private hubs and lorry associations by incentivizing collaboration through subsidies, tax breaks, or regulatory support. This can help streamline operations and improve efficiency in the transportation network.
- **Enhance Hub Structure:** Invest in infrastructure development to improve the structure and capacity of hubs. This includes expanding storage facilities, upgrading loading docks, and implementing automation technologies to increase throughput and reduce bottlenecks.

## CONCLUSION

The findings highlight several critical challenges faced by domestic logistics operations, particularly concerning the adoption of the hub and spoke distribution model. Issues such as the absence of common hubs, inadequate infrastructure, and technological deficiencies hinder the sector's efficiency and growth. Additionally, government implications including taxation, road infrastructure, and regulatory hurdles exacerbate these challenges, further constraining the industry's potential. In conclusion, the successful implementation of these suggestions requires concerted efforts from both the private and public sectors. Collaboration, innovation, and proactive engagement with stakeholders are crucial for overcoming the existing barriers and unlocking the full potential of domestic logistics operations.

## REFERENCE

1. Browning, J. (2003). Logistics of container transport in the Yangtze & Yellow Sea Regions. Journal of International Logistics and Trade, 1(1), 1-27.
2. Lemoine, W., & Dagnæs, L. (2003). Globalisation strategies and business organisation of a network of logistics service providers. International Journal of Physical Distribution & Logistics Management, 33(3), 209-228.
3. Pettit, S. J., & Beresford, A. K. C. (2009). Port development: from gateways to logistics hubs. Maritime Policy & Management, 36(3), 253-267.
4. Groothedde, B., Ruijgrok, C., & Tavasszy, L. (2005). Towards collaborative, intermodal hub networks: A case study in the fast moving consumer goods market. Transportation Research Part E: Logistics and Transportation Review, 41(6), 567-583.

**CITATION**
A.Nafih, V.Saranya, & Nithis N. (2024). Implication in Adoption of Hub and Spoke Distribution Model in Domestic Logistics Operations with Special Reference to Coimbatore City. In Global Journal of Research in Humanities & Cultural Studies (Vol. 4, Number 2, pp. 30–35). https://doi.org/10.5281/zenodo.10936336