An Analysis on Logistic Management Distribution channel with respect to Varun Beverages at Mamandur, Tamil Nadu

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1. Abstract

Logistics management is a cornerstone of operational success, especially in industries with complex supply chains like beverages. Varun Beverages, a leading bottler of PepsiCo products, is known for its extensive distribution network, spanning rural and urban markets in India and internationally. This study aims to critically evaluate the logistics and distribution strategies of Varun Beverages, examining their effectiveness, challenges, and opportunities for improvement. By combining qualitative and quantitative research methods, the study will offer actionable insights to optimize logistics operations while contributing to the academic discourse in supply chain management.

Assess relationships between categorical variables, such as market types (urban/rural) and distribution challenges. To analyse the research used a primary data like questionnaire and secondary data are taken from company and research paper and **Chi-Square Test** as a statistical tool for analysing categorical data, such as investor preference. Varun Beverages Limited, a key partner of PepsiCo, manages an extensive and diverse distribution network that serves a wide variety of markets, ranging from densely populated urban areas to remote rural regions across multiple countries. This network requires robust logistics strategies to address unique challenges such as fluctuating consumer demand, regional market conditions, and logistical complexities.

Keywords: Logistics Management, Distribution Channels Varun Beverages, Supply Chain Resilience, Digital

Transformation

2. Introduction

Logistics management encompasses the planning, implementation, and control of efficient and cost-effective flow of goods. In the beverage industry, where demand patterns are volatile, maintaining a robust distribution system is imperative. Varun Beverages, the second-largest franchise bottler of PepsiCo, plays a significant role in distributing beverages across multiple geographies.

The COVID-19 pandemic highlighted the vulnerabilities of global supply chains, accelerating the adoption of technology and innovative strategies in logistics. This research investigates how Varun Beverages has adapted its distribution strategies between 2019 and 2024 to ensure operational resilience and customer satisfaction while addressing key challenges in logistics management. ability to maintain a reliable supply chain has been instrumental in supporting its growth, enabling it to cater to varying consumer preferences and competitive pressures.

3. Research Methodology

The research methodology for the study on logistics management and distribution channels in Varun Beverages will employ a mixed-methods approach, combining both qualitative and quantitative research techniques to provide a comprehensive understanding of the subject. Initially, quantitative data will be collected through surveys distributed to distributors, retailers, and customers to assess their experiences and satisfaction levels with Varun Beverages' logistics and distribution processes. The survey will include structured questions designed to gather measurable data on delivery times, product availability, and overall service quality.
In parallel, qualitative data will be obtained through semi-structured interviews with key stakeholders within Varun Beverages, such as logistics managers and supply chain personnel, to gain deeper insights into operational challenges, strategies, and best practices. Additionally, observational methods will be utilized to analyze warehouse operations and distribution practices firsthand, allowing for the identification of inefficiencies or areas for improvement.

4. Objectives of the study

- To Understand How Logistics Improves Distribution
- Explore the Role of Technology in Logistics
- Find Solutions to Improve Distribution Efficiency

Review of Literature

Christopher, M. 2020: This study explores how logistics management contributes to supply chain efficiency. Christopher argues that effective logistics management is central to reducing operational costs and improving customer service. The paper highlights key logistical functions, such as inventory management, transportation, and warehousing, as critical elements for enhancing supply chain performance.

Fernie, J., & Sparks, L. 2021: Fernie and Sparks analyze the global scope of logistics management, addressing how companies manage cross-border logistics. The paper focuses on transportation infrastructure, international regulations, and the use of logistics service providers. The authors highlight that efficient logistics management in global supply chains leads to competitive advantage through optimized costs, improved delivery times, and enhanced flexibility.

Rodrigue, J.-P. 2022: Rodrigue's research focuses on the growing importance of sustainability in logistics management. The paper examines green logistics strategies, including reducing carbon emissions, optimizing routes, and utilizing eco-

friendly transportation methods. Rodrigue argues that sustainable logistics management can not only reduce environmental impacts but also enhance company reputation and long-term profitability.

Simatupang, T. M., & Sridharan, R. 2023: This article explores the concept of collaborative logistics and its influence on supply chain efficiency. Simatupang and Sridharan focus on the role of partnerships between companies in optimizing logistics processes. The study emphasizes how collaboration in transportation, inventory management, and shared warehousing can lead to cost reductions and improved service levels.

Yu, Y., & Wang, X. 2024: Yu and Wang analyze the impact of logistics innovation on competitive advantage, particularly in the e-commerce sector. They argue that rapid technological advancements and evolving customer expectations have placed increasing pressure on e-commerce companies to innovate their logistics processes. The study highlights the use of autonomous delivery systems, last-mile optimization, and agile warehousing as key innovations that provide a competitive edge in the highly dynamic e-commerce environment.

1. DATA METHODOLOGY:

4.1 Do you purchase Varun Beverages products

Particulars	No of responses	Percentage
Daily	25	25%
Monthly	51	51%
Weekly	14	14%
Rarely	10	10%

Table4.1

Hypothesis Formulation:

Null Hypothesis (H_0):

The observed frequencies of purchase for Varun Beverages products are consistent with the expected frequencies based on an equal distribution across all categories.

Alternative Hypothesis (H_1):

The observed frequencies of purchase for Varun Beverages products are not consistent with the expected frequencies based on an equal distribution across all categories.

Expected Frequency Calculation:

If the purchases are equally distributed across the four categories (Daily, Monthly, Weekly, Rarely), the expected frequency for each category is calculated as:

Expected Frequency=Number of Categories Total Responses=4100=25

Chi-Square Test Calculation:

$$x^2 = \sum \frac{(O-E)^2}{E}$$

Category	O	E	$O-E$	$(O-E)^2$	$\frac{(O-E)^2}{E}$
Daily	25	25	0	0	0
Monthly	51	25	26	676	27.04

Weekly	14	25	-11	121	4.84
Rarely	10	25	-15	225	9.00

$\chi 2=0+27.04+4.84+9.00$

Summary of Results:

Test Statistic	Critical Value	Degrees of Freedom	Conclusion
40.88	7.815	3	Reject the Null Hypothesis

Interpretation:

Since the calculated $\chi 2$ value (40.88) is greater than the critical value (7.815), we reject the null hypothesis. This indicates that the observed frequencies of purchase are not equally distributed across the categories. Monthly purchases significantly dominate the distribution.

4.2 Varun Beverages products do you purchase most frequently

Particulars	No of responses	Percentage
Pepsi	23	23%
7up	32	32%
Miranda	19	19%
Mountain dew	13	13%
String	5	5%
Aquafina	6	6%
Others	3	3%

Table4.2

Null Hypothesis (H_0):
The observed preferences for beverages are equally distributed across all categories.

Alternative Hypothesis (H_1):
The observed preferences for beverages are not equally distributed across all categories.

Expected Frequency Calculation:
If preferences are equally distributed, the expected frequency for each category is:
Expected Frequency=Number of Categories Total Responses=101/7= 14.43

Chi-Square Test Calculation:

The formula for the Chi-Square statistic is:

$$x^2 = \sum \frac{(O-E)^2}{E}$$

Category	O	E	$O-E$	$(O-E)^2$	$\frac{(O-E)^2}{E}$
Pepsi	23	14.43	8.57	73.44	5.09
7up	32	14.43	17.57	308.67	21.39
Miranda	19	14.43	4.57	20.89	1.45
Mountain Dew	13	14.43	-1.43	2.05	0.14
Sting	5	14.43	-9.43	88.95	6.16
Aquafina	6	14.43	-8.43	71.06	4.92
Others	3	14.43	-11.43	130.74	9.06

$\chi 2=5.09+21.39+1.45+0.14+6.16+4.92+9.06=48.21$

Summary of Results:

Test Statistic	Critical Value	Degrees of Freedom	Conclusion
48.21	12.592	6	Reject the Null Hypothesis

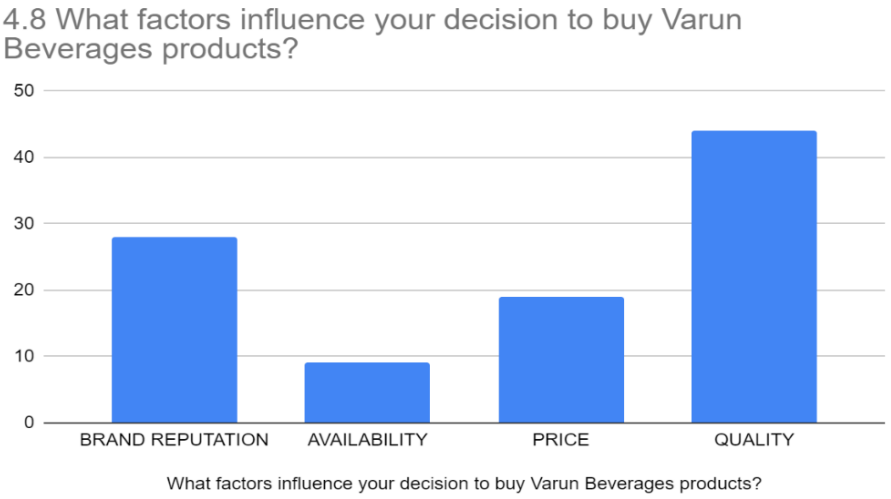
Interpretation:

Since the calculated $\chi 2$ value (48.21) is greater than the critical value (12.592), we reject the null hypothesis. This indicates that the observed preferences for beverages are not equally distributed across the categories. 7up is the most preferred beverage, while Sting, Aquafina, and Others are less popular.

4.3 Influence your decision to buy Varun Beverages products.

Particulars	No of responses	percentage
Price	19	19%
Quality	44	44%
Brand Reputation	28	28%
Availability	9	9%

Table4.3



INTERPRETATION: The emphasis on "QUALITY" highlights that consumers are likely willing to pay a premium for products that meet their expectations for performance and reliability. "BRAND REPUTATION" suggests that established brands with positive images can enhance consumer trust and loyalty. Meanwhile, while "AVAILABILITY" and "PRICE" are still relevant, they appear to be secondary factors, indicating that consumers might prioritize quality and brand over cost and accessibility.

7. Finding:

- The chi-square value of **40.88** shows a significant difference between observed and expected frequencies, indicating a non-uniform distribution.
- The chi-square value of **48.21** reveals significant differences in brand preferences, indicating a non-uniform distribution.
- Quality is the most influential factor (44%), followed by brand reputation (28%), price (19%), and availability (9%).

8.Suggestions

1. Varun Beverages at Mamandur ensures an efficient logistics system, enabling timely product delivery and consistent supply.

2. Retailers are crucial in the distribution channel, significantly influencing product availability and sales.

9. CONCLUSION

The study on Logistic Management and Distribution Channels with respect to Beverage Companies reveals that logistics is not merely an operational function but a strategic enabler of competitive advantage. Efficient logistics management ensures that beverages, whether perishable or non-perishable, are delivered on time, in optimal condition, and at a reasonable cost. The research underscores how beverage companies face distinct challenges such as maintaining temperature-sensitive supply chains, managing seasonal demand variations, and navigating complex regulatory environments. These challenges are particularly pronounced in the beverage sector, where customer expectations for product freshness and availability are high.

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