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A Study on Supplychain Management Practices and their Impact on Operational Efficiency at Pangajakasthuri Herbals India Limited

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Abstract

The aim of this study is to investigate about the practices in the chain of supply and how it can effect the operational efficiency of Pankajakasthuri Herbals India Private Limited. The coordination of procurement, production, inventory and distribution activities is an important part of supply chain management. The study is secondary data based, with the secondary data being drawn from company records and reports. The performance of the supply chain is measured with the following analytical tools: Value Stream Mapping (VSM), Pareto Analysis, Supplier Performance Scorecard (SPSC), Lead Time Analysis. The study highlights the issues related to the delay in raw material supply, lack of coordination with suppliers and inefficient inventory management. It finds that integration and coordination of the supply chain are essential for improving the operation efficiency and the growth of the organization.

Keywords: Supply Chain Management, Operational Efficiency, Value Stream Mapping, Lead Time Analysis, Bottleneck Analysis, Inventory Management, Supplier Performance, Cycle Time, Gantt Chart, Herbal Industry, Procurement Efficiency, Production Planning

Introduction

The Supply Chain Management (SCM) function in today's organizations is an integral part of ensuring the smooth flow of goods, services, and information from suppliers to customers. Efficient SCM contributes in minimizing the operational costs, boosting the productivity and increasing Customer Satisfaction. SCM is significant in manufacturing industries particularly in the herbal and pharmaceutical industry because the raw materials used are perishable and there are stringent quality requirements. For the operational efficiency, there should be proper co-ordination among supplier, production unit, and distribution channels.

Review of Literature

Anaba, D.C., Kess-Momoh, A.J., & Ayodeji, S.A. (2024). Optimization of Supply Chain and Logistics Management: A review of the modern practices.

Anaba et al. (2024) have reviewed the best modern practices in supply chain and logistics management to enhance organizational efficiency and responsiveness. The report emphasizes the role of technologies like artificial intelligence, Internet of Things (IoT) and automation in improving real-time visibility and decision making. The study finds that for the success of the supply chain performance, there needs to be continuous innovation and technology adoption.

Caiado, R.G.G., Scavarda, L.F., dos Reis, J.C.G., & de Freitas, K.A. (2026). Operations and Supply Chain Management 5.0: New Paths for Sustainability."

Caiado et al. look at the impact of advanced technologies in the modern supply chains in relation to Supply Chain Management 5.0. The findings suggest that, in organisations that have implemented these practices, they find that such organisations become more resilient and adaptable in dynamic environments. The research findings indicate that technological advances and sustainable practices contribute positively to operational efficiency and sustainability in the long term.

Gupta, P., Sharma, Y., Chauhan, A., Parewa, B., Rai, P., & Naik, N. (2025). The title of the paper is "Green Supply Chain Management Practices and Sustainability in Indian Manufacturing Enterprises."

The study by Gupta et al. (2025) focuses on the concept of green supply chain management for attaining sustainability in manufacturing organisations. The results show that these activities have a significant positive effect on the environmental performance and organizational effectiveness. The study also highlights the importance of top management in implementing strategies of sustainability. It finds that the implementation of green supply chain not only has a positive effect on the environment but also increases the operational performance and competitiveness in the long run.

Nugroho, A., Santosa, B., & Khoa, T.M. (2025). The role of Supply Chain Resilience in improving Operational efficiency of Manufacturing SMEs."

Nugroho et al. centre on the role of supply chain resilience on the efficiency of operations in small and medium enterprises manufacturing. The results show resilience to have a significant impact on cost efficiency, production continuity and delivery performance. The study further emphasizes that the coordination of departments increases the overall efficiency. It concludes that supply chain resiliency is a key capability for organizations in uncertain and competitive environments.

Rahul Verma (2024). Supply Chain Management: Enhancing Efficiency and Sustainability in the Supply Chain.

The research highlights the importance of implementing strategies like Just In Time (JIT), demand forecasting and automation, to cut down on costs and enhance responsiveness. The results demonstrate that organisations that have adopted these strategies have benefitted from improved service levels, and operational performance. The report concludes that a combination of efficiency and sustainability is the key to success in the long run.3.

Research Methodology

It is a descriptive research design in which supply chain management practices are described and analyzed in order to examine its effect on operational efficiency. Secondary data is gathered from companies' reports, records and published sources. Data is analyzed using various analytical tools including Value Stream Mapping, Pareto Analysis, Supplier Performance Scorecard and Lead Time Analysis. This research aims to assess the procurement, inventory management, production planning, and distribution processes and pinpoint areas for enhancement and possible inefficiencies.

Objectives

- To understand the practices of supply chain management in the organization.
- To evaluate the performances of procurement and supplier management.

Data Analysis and Interpretation

Value Stream Mapping

Value Stream Mapping (VSM) is the tool for analysing the flow of materials and information in a process. It assists to determine value added and non-value added activities in the supply chain. Helpful to identify delays, excess inventory and inefficiencies. This tool works to organisations that want to become more efficient in their processes and cut down on their waste.

Table 1 Value Stream Mapping

Process Stage	Processing Time	Waiting Time	Total Time
Raw material	0.004	5	5.00
Production	0.001	4	4.00
Quality	0.003	2	2.00
Packing	0.002	3	3.00

Source: Primary Survey

Interpretation: From the VSM analysis, it is observed that Lead time is 14 days whereas the actual processing time is very small. This indicates that most of the time is spent on waiting rather than productive activities. Waiting time is considered as high when it shows inefficiencies in the system and lack of coordination between the processes. Non-value added activities can cause delays in the supply chain. Shorter waiting times can be helpful for the overall effectiveness of the operation.

Pareto Analysis

Pareto analysis is a statistical technique that determines the critical factors in a problem. It is derived from the 80/20 principle, which is that a small number of causes give rise to the bulk of the problems. This approach can be used to identify important issues that need to be addressed right away. It distinguishes between the “vital few” and the “trivial many. In this study, Pareto Analysis is applied to find the major issues in the supply chain.

Table 2 Factors Affecting Supply Chain

Factors	Total Frequency	Cumulative %
Delay in raw material supply	212	28.5
Poor supplier coordination	170	51.3
Inefficient inventory management	126	68.2
High transportation cost	88	80.1
Lack of demand forecasting accuracy	60	88.2
Production delays	50	94.9
Communication gap between departments	40	100

Source: Primary Survey

Interpretation: From Pareto analysis, it can be interpreted that the delay in raw material supply is the main problem in supply chain. There is also an issue with the coordination of suppliers and inefficient use of inventory. The three factors above are responsible for most inefficiencies in operations. Other factors have relatively smaller effects upon performance. So, addressing these key issues can have a major impact on the efficiency of the supply chain..

Supplier Performance Scorecard

The supplier efficiency is assessed in accordance with the key criteria using the Supplier Performance Scorecard. It can contain factors like quality, delivery and responsiveness. The tool is used to objectively compare the performance of suppliers.

Table 3 Supplier Performance Scorecard

Criteria	Weight (%)
Quality	35
Delivery Reliability	25
Cost Efficiency	15
Lead Time Consistency	15
Responsiveness	10
Total	100

Source: Primary Survey

Weighted Score Formula

Weighted Score=Rating ×Weight

Table 4 Final Supplier Scores

Supplier	Total Score	Percentage (%)	Rank
Supplier A	830	83.00	1
Supplier B	735	73.50	2
Supplier C	695	69.50	3

Source: Primary Survey

Lead Time Analysis

Lead Time Analysis measures the time required to finish various phases of the process of the supply chain. This tool is used for comparing planned time and actual time taken. It can be used to enhance scheduling and coordination. By using the lead time analysis, it is possible to reduce delays and enhance delivery performance in the organization.

Table 5 Lead Time Analysis

Process Stage	Processing Time	Waiting Time	Total Time
Raw Material Procurement	3 hrs	4.5 days	4.625
Raw Material Inspection	2 hrs	1.5 days	1.58
Manufacturing Process	6 hrs	3 days	3.25
In-process Quality Check	2 hrs (0.08 days)	1 day	1.08
Packaging & Labeling	4 hrs (0.17 days)	2 days	2.17

Finished Goods Inspection	2 hrs (0.08 days)	1 day	1.08
Dispatch & Distribution	3 hrs (0.125 days)	0.5 day	0.625

Source: Primary Survey

The analysis reveals that real time is longer than planned time in all phases of the process. The procurement and production stages have the largest delays. This is a sign of not planning well and supplier inefficiency. This 6 days delay has an impact on the overall performance of the supply chain. Minimizing such delays can enhance the efficiency of operations and customer satisfaction.

Gantt Chart

A Gantt Chart is a graphical representation of a project that displays the tasks and the timeline for the project. It assists in tracking schedules vs. actual work done. This tool shows the start and end time of each activity in a structured manner

Table 6 Gantt Chart

Production Activity	Planned	Actual
Raw Material Procurement	2	3
Raw Material Inspection	2	3
Production / Manufacturing	3	4
In-Process Quality Check	1	2
Packaging & Labeling	1	2
Finished Goods Quality Check	1	2
Dispatch / Distribution	1	1

Source: *Primary Survey*

Total Calculation

Particulars	Value
Total Planned Duration	11 Days
Total Actual Duration	17 Days
Total Delay	6 Days

The Gantt chart analysis reveals that there are obvious differences between the planned and actual schedules. Delays have been experienced in all activities particularly at the production and quality testing stages. The delays represent scheduling and lack of coordination among processes. Earlier activities have been delayed, impacting the later activities and thereby extending the overall project.

Cycle Time Analysis

Cycle Time is the total amount of time required to start to finish a process. It aids in the evaluation of the efficiency of each operation in the supply chain. This tool concentrates on the amount of time the product takes to make, the actual work time. It can help identify delays and bottlenecks in the operations.

Table 7 Gantt Chart

Process Stage	Processing time	Inspection time
Raw Material Preparation	4	—
Manufacturing Process	13	2
In-process Quality Check	5	2
Packaging & Labeling	7	2
Final Inspection	3	2
Dispatch Preparation	3	—
Total	35 min	8 min

Source: Primary Survey

Cycle Time = Processing Time + Inspection Time

Table 8 Cycle Time

Particulars	Value
Working Hours per Day	8 hours (480 min)
Cycle Time per Unit	51 min
Units Produced per Day	480 / 51 ≈ 9 units

Source: Primary Survey

As per the cycle time analysis, the overall cycle time is very high as compared to the actual processing time. The majority of the time is used for waiting, not working. This means that the system is inefficient and thus, slow. This high waiting time has an impact on the overall performance of the operation.

Bottleneck Analysis

Bottleneck Analysis is a method used to determine which part of a process is limiting the performance of the process. It helps in detecting delays and constraints that slow down the supply chain. A bottleneck is an activity that takes longer than the other activities. This tool can be useful to improve the process flow and productivity.

Table 9 Bottleneck Analysis

Process Stage	Cycle time	Production capacity
Raw Material Preparation	6	10
Manufacturing Process	18	3
In-process Quality Check	7	8
Packaging & Labeling	11	5
Final Inspection	5	12
Dispatch Preparation	4	15

Source: Primary Survey

Formula:

Production Capacity (Units/Hour) = 60 / Cycle Time (Minutes)

Identification of Bottleneck

- Maximum Cycle Time = 18 minutes
- Minimum Capacity = 3 units/hour

Interpretation

The cycle time data are used to conduct the bottleneck analysis and identify the stage that slows down the overall production flow. From the table, it is observed that the manufacturing process has the highest cycle time of 18 minutes, which is significantly higher than other stages. This results in a very high cycle time, and the production capacity of the manufacturing stage is very low (3 units/hr). This means that manufacturing is the slowest process and it reduces the production capacity.

Findings

1. 14 days is the total lead time but the processing time is minimal indicating most of the time is spent in waiting and non value added activities. High inventory between stage means low coordination and inefficiency.
2. There are only a few major issues in the supply chain and the biggest is the delay in raw materials. Nearly 80% of inefficiencies are due to supplier coordination and inventory problems.
3. There are significant differences in the quality and delivery of suppliers. The poor performing suppliers impact procurement stability and production continuity.
4. There is a lot of waiting time as compared to processing time in most of the production activities like procurement and manufacturing. This will make production time longer and poor scheduling.

Planned Schedule (11 days) changed to 17 days = delay of 6 days. It means that there is inefficiency in planning and activities implementation.

The total production time per unit is 51 minutes, of which the manufacturing contributes the most. As the workload is not evenly distributed, the overall productivity is decreased.

The manufacture stage is the most time-consuming and least productive stage, thus creating a major constraint. This slows down the whole production flow and leads to waiting time.

There are some items of inventory that add up to a large portion of the total value, and these items need to be tightly controlled. Lower value items take up space and affect inventory efficiency.

The system is not very flexible in dealing with disturbances, that is, delays in one stage ripple through the system. This means that they aren't adaptable and don't plan for buffer.

Suggestions

- Lean operations should be implemented in the company to minimize waiting time and remove non-value added operations. There is a potential for enhanced flow between stages if there is improved coordination.
- Major issues such as raw material delay, supplier coordination and inefficiency in inventories should be targeted. Attention to these critical elements will have a profound impact on performance.
- High performing suppliers should be developed into strong relationships and weaker suppliers developed through evaluation. This guarantees uniformity of procurement and delivery.
- Wait times between processes should be minimized by improving the scheduling and coordination. For more effective control and response, consider real-time monitoring systems.
- The appropriate planning and good control of timetables must be employed to prevent delays. Timelines can be effectively maintained through regular reviews.
- Efficiency should be increased in the stages that involve a lot of time by optimising workflows. This will increase productivity and decrease the overall production time.

- The bottleneck in manufacturing needs to be resolved by expanding manufacturing capacity or by improving manufacturing processes. This will help improve the overall throughput and minimize delays.
- Control of high-value items by managing inventory in a proper manner by employing proper classification techniques. This can help minimize expenses and increase efficiency.
- Enhance departmental coordination by improving communication and integration. This will ensure smooth and efficient operation.
- The use of modern technologies and training programs is recommended in the long term to improve. This will improve productivity and running of the business.

Conclusion

The study emphasizes that efficient supply chain management plays a crucial role in enhancing operational efficiency in Pankajakasthuri Herbals India Private Limited. The analysis reveals that the key issues that impact performance are delays, coordination and lack of efficiency in inventory.

Implementing more efficient supply chain practices, better coordination and the use of modern technologies can help the organization to achieve sustainable growth and efficiency. A well-managed supply chain is key to achieving competitiveness and long-term success.

Bibliography

Reference Books

1. Chopra, S., & Meindl, P. (2019). Supply Chain Management: Strategy, Planning, and Operation (7th ed.). Pearson Education.
2. Heizer, J., Render, B., & Munson, C. (2020). Operations Management: Sustainability and Supply Chain Management (13th ed.). Pearson.
3. Rother, M., & Shook, J. (2003). Learning to See: Value Stream Mapping to Add Value and Eliminate Muda. Lean Enterprise Institute.
4. Stevenson, W. J. (2018). Operations Management (13th ed.). McGraw-Hill Education.
5. Krajewski, L. J., Malhotra, M. K., & Ritzman, L. P. (2019). Operations Management: Processes and Supply Chains (12th ed.). Pearson.
6. Jacobs, F. R., & Chase, R. B. (2021). Operations and Supply Chain Management (16th ed.). McGraw-Hill Education.
7. Slack, N., Brandon-Jones, A., & Johnston, R. (2019). Operations Management (9th ed.). Pearson Education.
8. Monczka, R. M., Handfield, R. B., Giunipero, L. C., & Patterson, J. L. (2020). Purchasing and Supply Chain Management (7th ed.). Cengage Learning.
9. Christopher, M. (2016). Logistics and Supply Chain Management (5th ed.). Pearson Education.
10. Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2021). Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies (4th ed.). McGraw-Hill Education.
11. Bowersox, D. J., Closs, D. J., Cooper, M. B., & Bowersox, J. C. (2020). Supply Chain Logistics Management (5th ed.). McGraw-Hill Education.

Reference Articles

1. Caiado, R. G. G., Scavarda, L. F., dos Reis, J. C. G., & de Freitas, K. A. (2026). “Operations and Supply Chain Management 5.0: New Paths for Sustainability.” Discover Sustainability, 7, Article 213.

2. Nugroho, A., Santosa, B., & Khoa, T. M. (2025). "The Role of Supply Chain Resilience in Enhancing Operational Efficiency among Manufacturing SMEs." Journal of Economics and Management, 3(2), 34–41.
3. Gupta, P., Sharma, Y., Chauhan, A., Parewa, B., Rai, P., & Naik, N. (2025). "Investigation of Green Supply Chain Management Practices and Sustainability in Indian Manufacturing Enterprises Using a Structural Equation Modelling Approach." Scientific Reports, 15, Article 14909, 1–19.
4. Patel, A., Shukla, S., & Patel, K. (2025). "A Review of Sustainable Supply Chain Management Frameworks: Gaps and Outlining Future Direction." Asian Journal of Economic Business and Accounting, 25(5), 139–152.
5. Anaba, D. C., Kess-Momoh, A. J., & Ayodeji, S. A. (2024). "Optimizing Supply Chain and Logistics Management: A Review of Modern Practices." Open Access Research Journal of Science and Technology, 11(2), 20–28.
6. Verma, R. (2024). "Supply Chain Management: Optimizing Efficiency and Sustainability in the Supply Network." Journal of Advanced Management Studies, 1(2), 13–18.
7. Asrol, M. (2024). "Industry 4.0 Adoption in Supply Chain Operations: A Systematic Literature Review." International Journal of Technology, 15(3), 456–472.
8. Agbelusi, J., Ashi, T. A., & Chukwunweike, S. O. (2024). "Sustainable and Innovative Supply Chain Strategies for Operational Excellence." Journal of Sustainable Business and Management, 12(2), 112–128.
9. Quadras, G., Talyshinskii, A., & Kowshik, S. (2024). "Innovative Strategies in Lean Supply Chain Management: Enhancing Efficiency in Healthcare." Journal of Computer, Mechanical and Management, 3(3), Article 240127, 22–35.
10. Lee, J., & Kim, S. (2021). "The Effect of Supply Chain Management Strategy on Operational and Financial Performance in SMEs." MDPI, 13(9), Article 5138, 1–18.

Reference Websites

1. https://www.lucidchart.com/
2. https://www.supplychaindigital.com
3. https://www.pankajakasthuri
4. https://www.supplychaindigital.com/