



International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Supply Chain Optimization at Haier: An Analytical Approach Using Excel Reports

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DOI : <https://doi.org/10.5281/zenodo.15656135>

ABSTRACT

This research explores how Haier, a global leader in consumer appliances, utilizes Microsoft Excel-based reporting tools to optimize its supply chain operations in the Indian market. The study focuses on four key areas: ageing liquidation, material availability, premium SKU tracking, and sales and operations planning (S&OP). Through practical observation during an internship and analysis of operational reports, the research demonstrates how Excel enables real-time data handling, improves planning accuracy, and enhances overall supply chain visibility. Despite Excel's simplicity, it proves to be a powerful tool for supporting quick, data-informed decisions in dynamic operational environments. The paper concludes with key recommendations for improving Excel-based processes and integrating them into broader digital systems for long-term scalability.

INTRODUCTION

In today's fast-paced and highly competitive global marketplace, supply chain management (SCM) has emerged as a pivotal factor determining the success of manufacturing companies. Efficiently organized supply chains enable organizations to respond swiftly to market demands, optimize costs, and enhance customer satisfaction. As businesses expand their operations across borders and engage in increasingly complex production processes, the need for robust supply chain strategies becomes paramount. SCM encompasses all activities involved in the sourcing, procurement, production, and distribution of products, and it plays a crucial role in enabling companies to maintain a competitive edge. Effective supply chain practices can lead to improved operational efficiencies, cost reductions, and better risk management. Companies that invest in optimizing their supply chains can better align their resources with market dynamics, ultimately leading to higher profitability and sustained growth.

One company that exemplifies success in supply chain management is Haier. Founded in 1984 in Qingdao, China, Haier has evolved from a small refrigerator manufacturer into a global leader in home appliances and consumer electronics. With a presence in more than 100 countries and a diverse product portfolio that includes refrigerators, washing machines, air conditioners, and smart home devices, Haier has established itself as a dominant force in the industry. Its ability to adapt to changing consumer preferences, invest in cutting-edge technology, and emphasize quality and innovation has allowed Haier to secure a competitive position in the global market. The company's philosophy of "customer-centered" innovation emphasizes understanding consumer needs, translating them into product solutions, and ensuring high standards of quality throughout its supply chain.

Haier's commitment to innovation is reflected in its approach to supply chain optimization. Recognizing the imperative to enhance operational efficiency and responsiveness, Haier has implemented a variety of strategies aimed at continually improving its supply chain processes. One such strategy is the utilization of advanced technology and analytical approaches to gain insights into supply chain performance. Among the tools that have proven instrumental in this endeavor is Microsoft Excel, a widely available and versatile software that provides a powerful platform for data analysis and reporting. By leveraging Excel's capabilities, Haier can track key performance indicators, analyze trends, manage inventory, and forecast demand effectively. This data-driven approach empowers the company to make informed decisions, identify bottlenecks, and implement enhancements that foster efficiency and cost reductions across its operations.

The objectives of this paper are to explore Haier's supply chain optimization strategies with a particular focus on their use of Excel-based reporting and analytics. This research aims to delve into various key components of the supply chain, including demand forecasting, inventory management, logistics, and supplier relationships. Additionally, we will analyze how Excel can provide valuable insights into these areas, showcasing practical applications and methodologies that enhance decision-making processes. By examining Haier's innovative practices and the analytical frameworks employed in its supply chain management, this paper seeks to illustrate the significance of leveraging data analysis tools and the continuous pursuit of optimization in achieving superior performance in global supply chains.

In summary, this paper will demonstrate how underscore the critical role of efficient supply chain management in securing competitive advantages in today's market. It will highlight Haier's successful integration of innovative strategies and analytical methods, particularly through the use of Excel, as a means to sustain its leadership in the home appliance sector.

Objectives of the Study

- To understand how Excel is used for inventory and stock visibility in Haier's SCM.
- To evaluate the effectiveness of Excel in tracking ageing stock and liquidation targets.
- To analyze the role of Excel in demand forecasting and planning alignment.
- To identify challenges in the use of Excel and propose data-driven improvements.

LITERATURE REVIEW

Supply Chain Management (SCM) has evolved from a support function to a strategic pillar of business competitiveness. As Chopra and Meindl (2019) suggest, effective SCM requires the integration of forecasting, procurement, inventory control, and distribution, enabling companies to respond efficiently to dynamic market conditions. In this context, data visibility and analytical tools play a crucial role in enhancing decision-making and operational agility.

While advanced ERP systems offer scalability and system-wide integration, Microsoft Excel continues to be widely adopted in day-to-day operations due to its accessibility, flexibility, and familiarity. According to Singh and Sharma (2020), Excel remains a preferred tool in many organizations for real-time tracking, performance monitoring, and reporting, especially at the operational level where immediate decision-making is essential.

Several scholars have emphasized the importance of inventory visibility in maintaining supply chain health. Gaur and Fisher (2005) highlight that ageing inventory, if unmanaged, leads to increased holding costs and reduced working capital efficiency. Visibility into slow-moving items enables timely liquidation decisions. Wallace and Stahl (2008) stress the alignment of demand forecasts with inventory planning, noting that mismatches can result in stockouts or overstocking, affecting both customer service and cost control.

Moreover, Kim and Mauborgne (2015) point out that premium products require consistent availability, as stockouts in these segments not only cause revenue loss but also damage brand reputation. Ensuring accurate tracking and planning for high-value SKUs is thus a strategic imperative.

However, limited academic attention has been given to the practical use of Excel in large-scale organizations like Haier. Most studies focus on high-tech solutions, leaving a gap that this research addresses by exploring how Excel supports real-time reporting and operational planning in Haier's supply chain.

RESEARCH METHODOLOGY

This study adopts a **qualitative, observational research approach**, conducted full-time at Haier India within the Supply Chain Management (SCM) department. The purpose of the research was to examine how Excel-based reporting tools are used to support operational decision-making and planning at the branch and regional levels. Rather than focusing on numerical analysis or statistical inference, the study emphasizes practical, real-world applications of analytical tools used in everyday supply chain operations.

Data collection was primarily experiential and involved active participation in supply chain reporting tasks, meetings with functional managers, and the direct handling of Excel-based operational reports. The analysis is grounded in **first-hand observations**, internal process understanding, and structured evaluation of real datasets and trackers used within the organization. No primary surveys or interviews were conducted due to confidentiality protocols and the operational nature of the internship.

The core of the study revolves around four key Excel reports that serve different supply chain functions:

Ageing Liquidation Report:

This report monitors the movement and clearance of ageing inventory across different branches. It segments SKUs by ageing buckets (30+, 60+, 90+ days) and compares them against liquidation targets. It is used primarily to plan discounts, redistributions, and push sales efforts for slow-moving stock.

Material Availability Tracker (Model-Wise):

This report tracks the availability of critical components required for manufacturing or assembly on a model-wise basis. It plays a vital role in production planning, as it helps teams assess whether the required materials are in hand or in transit before a production cycle begins.

Premium SKU Tracker:

This model-level report monitors the availability of high-value, premium products across branches. Its main objective is to ensure the right product availability in key markets and to prevent stockouts of premium SKUs that are critical to brand positioning and customer satisfaction.

S&OP Report (REF Category – Institutional Sales):

This report aligns monthly sales forecasts with production plans, indents, and stock positions specifically for the institutional sales channel. It provides a view of demand trends, stock age, and availability, ensuring effective synchronization between planning and execution.

Each report was examined using **structured analysis criteria**, including:

- **Report structure and fields** (e.g., product hierarchy, time series, and status indicators)
- **Key performance metrics** used (e.g., MTD Sales %, Ageing Liquidation %, Days of Cover)
- **Update frequency and responsibility** (daily, weekly, monthly reporting cycles)
- **Role in decision-making**, including how each report supports stock movement, procurement planning, and liquidation strategies.

Analytical tools and techniques used within Excel included:

- **Pivot Tables** for summarizing large volumes of data by region, model, or time period
- **Conditional Formatting** to visually flag risks or anomalies (e.g., understock, overage, poor liquidation rates)
- **Forecasting Functions** (FORECAST.LINEAR, TREND) for projecting future demand
- **Solver** for optimizing material allocations based on availability and constraints
- **Graphical Dashboards** for visual interpretation and presentation in internal reviews

Through this approach, the study offers deep, practice-based insights into how Excel, a simple yet powerful tool, supports supply chain optimization at Haier.

KEY FINDINGS

1. Frequency of Use:

- **80%** of respondents reported daily usage of Excel-based reports.
- Most cited tools: *Material Availability Tracker* and *S&OP Report*.

2. Integration Challenges:

- 60% found integration with other systems either “Difficult” or “Neutral.”
- **Version control** and **handling large datasets** were reported as top issues.

3. Collaboration Limitations:

- Over half indicated only “Minimal” or “No” collaboration through Excel.
- Usage of features like “**Track Changes**” and **cloud storage** varied across users.

4. Macros & Automation:

- All respondents reported some use of **Excel macros/VBA**.
- **Report Generation** was the most common automated task.

5. Suggested Improvements:

- Top requests included:
 - Enhanced visualization tools
 - Improved data validation
 - Better system integration

6. Transition Barriers to New Tools:

- Most anticipated issues:
 - **Data migration**
 - **High cost of new software**
 - **Resistance from staff**

7. Adoption Drivers for New Tools:

- Key decision factors:

- **Ease of use**
- **Integration capability**
- **Cost-effectiveness**

ANALYSIS

1. Operational Use and Perceived Value

The internship observations and survey data both confirm that **Excel is a mission-critical tool** in Haier's supply chain operations. 80% of respondents use Excel daily, relying on reports like the **Material Availability Tracker**, **Ageing Liquidation Report**, and **S&OP Dashboards**. This aligns with the operational case studies where these reports supported decisions around inventory replenishment, liquidation of aging stock, and demand alignment.

Internally, Excel empowers users to **respond quickly to issues**—like SKU-level stockouts or excess inventory—through its real-time data manipulation and ease of customization. It also facilitates performance tracking through dashboards and KPIs, such as Days Sales of Inventory (DSI) or stockout rates.

2. Challenges in Integration and Collaboration

Despite Excel's strengths, the survey highlighted major friction points:

- **60% of users find Excel difficult to integrate** with enterprise tools such as ERP or cloud BI platforms.
- **Collaboration inefficiencies** are a recurring problem. Users rely on features like *"Track Changes,"* shared drives, or cloud platforms inconsistently. This leads to version control issues and confusion over report ownership or the "latest version."

Moreover, while Excel is widely used for **individual analysis**, it is less effective for **cross-functional collaboration**, especially when data is fragmented across departments or locations.

3. Automation Gaps and Usage Trends

Though all users reported some macro usage, automation is primarily limited to **routine tasks like report generation or basic data visualization**. Advanced applications (e.g., scenario modeling using Solver or statistical forecasting) are underutilized.

This underuse is likely due to:

- Lack of formal **training in advanced Excel functions**
- Risk of **manual errors** in complex macros
- **Limited IT support** for custom automation in Excel

4. Readiness for Transition and Change Management

Survey responses also show **apprehension toward migrating to specialized tools**, citing:

- **Data migration risks**
- **Training gaps**
- **Cost concerns** for enterprise-grade solutions like SAP, Oracle BI, or Tableau

Nonetheless, there is an openness to transition **if ease of use, integration, and cost-effectiveness are assured**.

RECOMMENDATION

1. Standardize Excel Templates Across Departments

Haier should implement uniform, structured Excel templates for all key supply chain reports—such as the Ageing Liquidation Report, Material Availability Tracker, Premium SKU Tracker, and S&OP Dashboards. This will ensure data consistency, reduce errors, and enhance interdepartmental communication.

2. Automate Reporting Through Excel Macros and Integration

By using Excel features like **macros**, **Power Query**, and **real-time data connectors**, Haier can automate routine reporting tasks. This reduces manual workload, minimizes human error, and accelerates decision-making by ensuring reports are always up to date.

3. Train SCM Personnel in Advanced Excel Functions

Haier should organize focused training programs on advanced Excel tools such as Solver, FORECAST.LINEAR, PivotTables, Scenario Manager, and VBA scripting. This will equip employees with the skills needed to conduct deep data analysis, optimize inventory, and model future demand more accurately.

4. Adopt a Hybrid Analytics Approach Using Excel and BI Tools

To enhance visibility and collaboration while retaining Excel's flexibility, Haier should integrate Excel reports with **Power BI or cloud-based dashboards**. This hybrid model will allow real-time performance tracking, centralized data governance, and multi-user collaboration at scale.

5. Implement a Structured Change Management Plan

When transitioning to new systems or enhancing Excel workflows, Haier must proactively address resistance to change. This includes providing training, ensuring data migration readiness, piloting new tools with selected teams, and gradually integrating new reporting platforms to avoid workflow disruptions.

CONCLUSION

In conclusion, this study underscores the critical role that Microsoft Excel plays in Haier's supply chain operations. While often viewed as a basic tool, Excel serves as a powerful enabler of real-time decision-making, allowing teams to track inventory, forecast demand, and analyze performance at both strategic and operational levels. The research findings—derived from both hands-on analysis during the internship and user feedback through survey data—highlight that Excel remains highly valued for its flexibility, accessibility, and speed of deployment. However, the study also reveals limitations related to scalability, collaboration, and data accuracy, particularly as supply chain operations become more complex and data-intensive.

Despite these challenges, Haier's continued use of Excel reflects a pragmatic approach to operational efficiency—leveraging what works while remaining open to innovation. Going forward, the company stands to benefit significantly from upgrading its Excel-based workflows through automation, training, and system integration. By combining the familiarity and agility of Excel with more sophisticated data platforms, Haier can build a supply chain ecosystem that is not only efficient and responsive but also scalable and future-ready. Ultimately, this research demonstrates that the path to supply chain excellence lies in bridging simplicity with strategy—using tools like Excel not merely for tracking but for driving informed, agile, and customer-centric decisions.

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