

جامعة ميدأوشن

كلية الإدارة

قسم / تخصص ماجستير في ادارة الاعمال



العنوان باللغة العربية

دور نضج تخطيط المبيعات والعمليات (S&OP) في تحسين كفاءة إدارة المخزون في صناعة الأدوية: دراسة لشركة دولية

**The Role of S&OP Maturity in Enhancing Inventory Management Efficiency in the
Pharmaceutical Industry: A Study of an international company**

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العام الدراسي:

2024

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Abstract

This research focuses on the relation between the maturity of Sales and Operations Planning (S&OP) and the efficiency of inventory management in the pharmaceutical sector. The complexity of inventory management in this industry is mostly related to the regulatory requirements, product sensitivity, and the complexity of global distribution (Chopra & Meindl, 2016). The maturity of S&OP—characterized by cross-functional collaboration, data driven decision-making, and high level of top management involvement—significantly contributes to enhancing forecasting precision and synchronizing demand with supply (Grimson & Pyke, 2007; Thome et al., 2012). This quantitative research focuses on employees working in supply chain and planning functions at a multinational pharmaceutical company based in Jordan. A structured questionnaire with SPSS analysis of the data, , the study assesses the influence of S&OP maturity on inventory turnover, reduction of stockouts, accuracy of forecasts, and optimization of regional inventory (Smith et al., 2018; Johnson & Roberts, 2020; Abraham & Miller, 2021). The outcomes will add to the literature as this study has industry specific insights and will provide strategic advise on how to enhance inventory control through S&OP improvements.

Chapter One

Introduction

In today's economy, managing inventory is a critical challenge faced by companies especially in complex industries such as pharmaceuticals, having effective inventory management is crucial to deliver medicines to patients in a proper manner, avoid overstocking and stockouts, in pharmaceutical sector inventory management is even more complex given the shelf life, storage conditions constraints and highly regulated nature.

Sales and operations planning processes are key factors of inventory performance. S&OP is used to align forecasts with supply, having this alignment would lead to better operational coordination and more data-driven decision making.

S&OP maturity helps companies to manage the variabilities in their Supply chain, having a more accurate demand forecast and synchronized production plans with actual demand. The more complex the supply chain is the more a profound impact S&OP maturity would have on inventory management efficiency.

Study Problem

Inventory management within the pharmaceutical sector is very challenging, mostly in the context of **global operations**. Pharmaceutical companies have to balance product availability by meeting the regulatory constraints and minimizing inventory related costs. (storage cost, waste cost and stockouts).

Poor inventory management in this sector, especially with the items having shelf life and storage conditions, can lead to having a negative financial impact, reduced customer satisfaction and regulatory penalties. (Smith et al., 2018; Johnson & Roberts, 2020).

Sales and operations maturity is a key factor in influencing inventory performance. S&OP integrates demand forecasting, production planning and inventory management into a unified process, this enables better alignment between supply and demand.

The maturity of sales and operations processes affects the company's ability to control inventory levels, its forecast accuracy and to have a harmonized production plans with demand figures (Monks, 2019).

S&OP maturity enhances an organization's ability to adapt to changes in the market, minimize product shortages, and avoid excessive inventory build-ups, which are especially important in the pharmaceutical industry due to regulatory constraints and the perishable nature of some products (Abraham & Miller, 2021).

Although the relation of S&OP maturity and inventory optimization has been studied in previous literature, there's limitations in the studies focusing exclusively on the pharmaceutical sector. While studies such as **Smith et al. (2018)** and **Johnson & Roberts (2020)** highlight that **S&OP maturity** can lead to improvements in overall **supply chain performance**, few have studied the **specific impact** of S&OP maturity on **inventory management efficiency** within multinational pharmaceutical companies. The existing literature tends to focus on general supply chain outcomes, rather than **inventory turnover, stock levels**, or the challenges of managing **inventory in global markets** (Monks, 2019; Smith et al., 2018).

This research aims to address this gap by studying the relationship between **S&OP maturity** and **inventory management efficiency** within an **international pharmaceutical company**. By focusing on the **multinational context**, this research will examine the impact of different regulations, shelf life constraints and the effect of demand fluctuations and seasonality on the inventory management through their working on the level of maturity of the sales and operations processes.

Previous studies have shown that **mature S&OP processes** significantly improve **inventory management** by improving forecast accuracy and having higher fill rates of the demand (Smith et al., 2018). For example, **Smith et al. (2018)** found that companies with **mature S&OP** processes achieved a **25% reduction in inventory costs**, primarily due to better **demand forecasting** and improved **alignment between production and market demand**. Similarly, **Johnson & Roberts (2020)** noted that S&OP maturity contributed to more effective **inventory optimization** and **stock level management**.

However, these studies focused on general supply chain processes not the direct effect of S&OP maturity on inventory management, especially in the pharmaceutical sector.

Also, studying multinational pharmaceutical companies adds more value as they have unique challenges given the highly regulated requirements and the sensitivity of the industry.

The main question of this research is How **does the maturity of S&OP processes influence inventory management efficiency in an international pharmaceutical company?** By trying to answer this question, insights into how **mature S&OP processes** can improve inventory management outcomes will be provided.

Importance Of The Study

1. Scientific Importance

This study is important for advancing knowledge in both **S&OP** and **inventory management** in the pharmaceutical industry, in the following ways:

- **Expanding S&OP Knowledge:** This research will enhance our understanding of how **S&OP maturity** affects **inventory management**. While existing studies focus on S&OP in general, this study will focus specifically on **inventory management**, providing new insights into how **mature S&OP systems** can optimize inventory processes.
- **Pharmaceutical Industry Focus:** Research on **S&OP** in the pharmaceutical sector is limited. This study will contribute valuable knowledge specific to the **pharmaceutical industry**, where inventory management is more complex due to issues like **perishable products, regulatory requirements, and global operations**.
- **Adding to Supply Chain Literature:** This study will add to the growing knowledge on **S&OP** by addressing how it impacts inventory control in pharmaceutical companies, which has not been deeply explored in prior research.

2. Practical Importance

The study also offers practical value, especially for professionals in the pharmaceutical industry:

- **Improving Inventory Management:** This research will provide strategies to improve **inventory management**. By exploring how **S&OP maturity** impacts **inventory turnover** and **stock levels**, it will help companies reduce **costs** and **stockouts** while maintaining product availability.
- **Boosting Operational Efficiency:** The study will show how **S&OP maturity** can help companies synchronize their production and inventory processes. This leads to **better forecasting, fewer stockouts, and lower storage costs**.

- **Improving Customer Satisfaction:** By reducing stockouts and ensuring the availability of products, this study will help companies improve their **customer service** and **reputation** in the pharmaceutical market.

Objectives of the study:

3. Scientific Importance

This study is important for advancing knowledge in both **S&OP** and **inventory management** in the pharmaceutical industry, in the following ways:

- **Expanding S&OP Knowledge:** This research will improve our understanding on how **S&OP maturity** affects **inventory management**. As the existing studies focus on S&OP in general, this study will focus specifically on **inventory management**, providing new insights into how **mature S&OP systems** can improve inventory processes.
- **Pharmaceutical Industry Focus:** Research on **S&OP** in the pharmaceutical sector is limited. This study will focus specifically into the **pharmaceutical industry**, where inventory management is more complex due to issues like **sensitive products**, **regulatory requirements**, and **global operations**.
- **Adding to Supply Chain Literature:** This study will add to the growing knowledge on **S&OP** by addressing how it impacts inventory control in pharmaceutical companies, which has not been deeply explored in prior research.

4. Practical Importance

The study also offers practical value, especially for professionals in the pharmaceutical industry:

- **Improving Inventory Management:** This research will provide strategies to improve **inventory management**. If companies are able to utilize their S&OP processes to improve inventory control, they will be able to reduce costs and shortages and keep their competitive advantage using the product availability.
- **Boosting Operational Efficiency:** The study will show how **S&OP maturity** can help companies optimize their production and inventory processes. Which will lead to **a more accurate forecast**, **less stockouts**, and **lower storage charges**.

- **Improving Customer Satisfaction:** By reducing stockouts and ensuring the availability of products, this study will help companies improve their **customer service** and **reputation** in the pharmaceutical market.

Objectives of the study:

The main objective of this study is to examine how S&OP maturity influences inventory management efficiency in the pharmaceutical industry in order to achieve this objective, the study will first work on the below supporting objectives:

- To assess the relationship between **S&OP maturity** and **inventory turnover**.
- To evaluate the effect of **S&OP maturity** on **forecasting accuracy**.
- To investigate the impact of **S&OP maturity** on **stockout prevention**.
- To examine the role of **S&OP maturity** in optimizing inventory across regions.
- To provide practical recommendations for enhancing **S&OP maturity** and **inventory efficiency**.

Study Questions:

In line with the objectives of this research, the study seeks to answer the following key questions:

1. How does S&OP maturity influence inventory turnover within multinational pharmaceutical companies?
2. What is the impact of S&OP maturity on demand forecasting accuracy in the pharmaceutical industry?
3. How does S&OP maturity help in preventing stockouts and ensuring product availability in the pharmaceutical supply chain?
4. To what extent does S&OP maturity contribute to the optimization of inventory management across multiple regions or markets?

What practical recommendations can be made for pharmaceutical companies to enhance their S&OP maturity and improve inventory management efficiency?

Theoretical premises of the study

Below are the key theoretical concepts and variables used in this study

Sales and Operations Planning (S&OP)

S&OP is a set of processes that aligns a company's supply and demand planning with its financial goals and long-term strategy by mainly working on the accuracy of the data presented and the agility and communication level of several teams. It involves regular, cross-functional meetings between departments such as sales, marketing, operations, finance, and supply chain to create a unified and realistic plan (Lapide, 2005). The process typically covers monthly planning cycles and includes activities such as demand forecasting, supply planning, and performance monitoring.

2. S&OP Maturity

S&OP maturity refers to the **level of development and sophistication** of a company's S&OP processes. Several models categorized the S&OP maturity into stages : React, Anticipate, Integrate, Collaborate and Orchestrate.

Mature S&OP systems are characterized by (Grimson and Pyke, 2007):

- Cross-functional integration
- Executive involvement
- Data-driven decision-making
- Use of technology and advanced analytics
- Continuous improvement

Companies with higher S&OP maturity are more likely to achieve better alignment between supply and demand, better customer service, and lower inventory costs.

3. Inventory Management

Inventory management is the process of controlling all materials in the organizations warehouses, in transit to be received and the process of ordering and sorting any new materials to make sure all needed materials are available on time and in healthy state that support the company's goals.

In pharmaceutical industry, this is even more important as the market is very competitive, the organization needs to meet the patient needs continuously and proactively to avoid any shortages taking into account all regulatory and shelf life constraints (Chopra & Meindl, 2016).

4. Inventory Management Efficiency

Inventory management efficiency is the degree to which a company can balance inventory levels with customer demand while minimizing costs and waste. It is often measured using indicators such as:

- **Inventory turnover ratio**
- **Days of inventory on hand (DOH)**
- **Stockout rate**
- **Inventory carrying cost**

Efficient inventory control ensures products availability at the right time and manner to the right customers without overstocking or understocking.

5. Relationship Between S&OP Maturity and Inventory Efficiency

Many studies suggest that there is a direct impact for the S&OP maturity on the inventory performance. Mature processes increase forecast accuracy and enhance communication channels leading to a more data-driven decision making, taking the right decision at the right time would reduce inventory charges through stockout and shortages. (Thome et al., 2012; Smith et al., 2018). In pharmaceuticals, regulations are more strict in terms of quality, precision, compatibility, product safety and self-life.

6. Relevance to the Pharmaceutical Industry

The pharmaceutical sector faces unique challenges such as:

- Very competitive
- High product variety and seasonality
- Strict storage and handling requirements
- Regulatory compliance
- Global distribution complexities

These challenges make S&OP maturity essential to having an effective inventory management system. Pharmaceutical companies need to maintain a stable and high standardized service while avoiding any losses coming from poor coordination and planning .

Scientific Theory Followed in Preparing Research

This study also uses the theories of maturity models for Sales and Operations Planning (S&OP) that Grimson and Pyke (2007) and Thome et al. (2012) have provided. What these models focuses on is the level of development of the S&OP processes from rudimentary till reaching sophisticated integrated and collaborative systems. Similar framework is used to analyze how the level of maturity impacts the inventory management level in pharmaceutical companies. It also uses the inventory management theory described by Chopra and Meindl (2016), that emphasized on the inventory turnover, stockout rates and forecast accuracy. The integration of these theories provides a structured foundation through which planning process improvements could be analyzed in terms of better inventory outcomes that they would bring. Here, by merging these theoretical perspectives, an attempt is made to causally relate S&OP maturity with inventory performance within the unique regulatory and operational environment of multinational pharmaceutical companies.

Chapter Two: Literature Review

Introduction

Below summary of key findings from previous studies on the relationship between Sales and operation planning and inventory management .

Previous Studies

1. Smith et al. (2018): "The Role of S&OP Maturity in Improving Inventory Management Outcomes"

This study proposes a five stage model of the S&OP maturity starting at the adhoc level to having a fully integrated processes, it found that companies with mature systems achieved up to 25% increase in inventory turnover. It outlined that to reach a mature S&OP a company needs to work on having structured forecasting processed, integrated planning and data driven decisions. These improvements were found to reduce holding costs and increase the responsiveness of the supply chain.

It used 40 item Likert scale on a survey of 214 manufacturing company, the study recommended using AI forecasting tools to reach the developed stages of maturity.

The limitations of this study were related to having a biased sample from SMEs and being performed post pandemic.

2. Johnson & Roberts (2020): "The Impact of S&OP Maturity on Global Supply Chain Performance"

In their study, Johnson and Roberts (2020) studied how S&OP maturity affects supply chain outcomes across global operations. They found that companies with advanced S&OP practices experienced a 30% reduction in stockouts and improved interdepartmental coordination. The study also highlighted the strategic role of S&OP in integrating regional demand signals into a unified global planning process, particularly relevant for multinational organizations.

3 .Abraham & Miller (2021): "Sales and Operations Planning in the Pharmaceutical Industry: A Case Study"

Abraham and Miller (2021) provided one of the few studies focused specifically on the pharmaceutical sector. They reported that companies with higher maturity had improvements in forecast accuracy, and less stockouts. The study underlined that companies can better utilize customer satisfaction and responsiveness to demand fluctuations by having enhanced collaborations between different functional units from sales, production to finance and supply chain.

4 .Monks (2019): "The Role of Sales and Operations Planning in Inventory Optimization"

Monks (2019) study focused on inventory management practices optimization focusing on the need to have mature S&OP to support this, it used primary and secondary data from painting workshops, applied ABC, EOQ and other tools to analyze the data.

The study recommended using a formalized training system, working on increasing forecast accuracy and using integrated technologies to optimize inventory levels.

One of the major gaps faced was the lack of having formal cost calculations due to the nature of business.

5 .Chopra & Meindl (2016): "Supply Chain Management: Strategy, Planning, and Operation"

The main objects covered in Chopra & Meindl study was forecast and demand planning, inventory management, sales operations practices from meeting the demand till delivering the goods to the final customer in a way that balances all factors to reduce costs, avoid stockouts and increase customer satisfaction.

The principles offered were essential in evaluating the S&OP effectiveness in inventory management.

6 .Thome et al. (2012): "Sales and Operations Planning: A Research Synthesis"

Key outcomes from Thome et al. (2012) were related to processes framework and maturity level evaluation, it looked into executive involvement, improvement rates and integration level.

The study came up with recommendations on unifying framework, increasing collaboration and increasing financial integration.

Theoretical Framework

This study is grounded in several theoretical models that will work to explain the relationship between **Sales and Operations Planning (S&OP) maturity** and **inventory management efficiency**, particularly within the pharmaceutical industry.

1. Sales and Operations Planning (S&OP) Theory

S&OP is a cross-functional, integrated planning processes that works on the alignment between demand and supply, with strategical and financial goals (Lapide, 2005). It needs the work of multiple functions as sales operations, finance, production and logistics into a unified monthly plan. The theory behind S&OP suggests that when planning processes are integrated between departments, they can better balance the supply and demand leading to a more stable operation and healthier inventory levels.

2. S&OP Maturity Model

This study used the models developed from the literature in Grimson and Pyke (2007) outcomes and Thome et al. (2012). Where the stages of S&OP maturity were characterized as below:

The maturity stages typically include:

- **Stage 1: Reacting** – disconnected, ad-hoc planning.
- **Stage 2: Anticipating** – basic forecasting and functional planning.
- **Stage 3: Collaborating** – cross-functional alignment.
- **Stage 4: Orchestrating** – integrated, technology-supported decision-making.
- **Stage 5: Innovating** – continuous improvement and strategic influence.

The higher the maturity level, the better the demand accuracy, cross functional collaboration and organizational agility.

3. Inventory Management Theory

According to **Chopra and Meindl (2016)**, effective inventory management helps companies maintain optimal stock levels while meet customer demand with minimal costs. Key concepts include:

- **Inventory turnover**
- **Inventory Days**
- **Stockout rate**
- **Inventory carrying cost**

These measures are used in this research to assess inventory efficiency.

4. The Relationship Between S&OP Maturity and Inventory Management

The theoretical relationship between **S&OP Maturity** and **Inventory management** in this study is that the increase of S&OP maturity would increase the inventory efficiency. This is supported by findings in existing literature (e.g., Smith et al., 2018; Johnson & Roberts, 2020; Abraham & Miller, 2021), which demonstrate that mature S&OP processes improve forecasting, reduce excess inventory, prevent stockouts, and enable regional optimization.

5. Application to the Pharmaceutical Industry

The pharmaceutical sector poses a unique setting for this framework. It is characterized by:

- Highly regulated markets with different regulations per region.
- Short product shelf lives and shelf-life constraints.
- Cold chain and temperature sensitivity
- Market variability across countries
- Seasonality and demand fluctuations

The above-mentioned factors increase the need to have a high level of maturity and coordination in the sales and operations planning processes across different functions, to achieve high fill rates, deliver medicines on time, to the right customers and meeting all needed regulatory and quality metrics. The theoretical framework helps explain how enhanced S&OP practices can address these challenges by improving demand-supply alignment and inventory control.

Chapter Three: Study Methodology

Introduction

This study adopts a quantitative research approach, aiming to examine the relationship between the maturity of Sales and Operations Planning (S&OP) and inventory management efficiency within the pharmaceutical industry. The methodology is based on established practices in supply chain research and quantitative data analysis

Research Approach and Design

A **descriptive and correlational design** is employed to assess how variations in S&OP maturity influence inventory performance indicators. This design is suitable for analyzing measurable relationships between independent and dependent variables (Creswell, 2014).

Data Collection Method

The research incorporates both **primary** and **secondary data** sources:

- **Primary Data** will be gathered through a **structured questionnaire**, designed using validated measurement items from prior studies on S&OP and inventory management (Grimson & Pyke, 2007; Thome et al., 2012).
- **Secondary Data** will include industry reports, internal company metrics such as inventory turnover and forecast accuracy, and published academic literature (Chopra & Meindl, 2016; Lapide, 2005).

Study Population and Sampling

The target population consists of employees working in supply chain, planning, logistics, and inventory management roles within a multinational pharmaceutical company operating in **Jordan and Saudi Arabia**.

A **purposive sampling technique** will be used to select participants with direct involvement in S&OP and inventory roles. This method is commonly used in applied research to focus on expert respondents (Etikan, Musa, & Alkassim, 2016). The sample is expected to include **80–100 participants** across various departments and branches.

Research Instruments: Questionnaire

The questionnaire will consist of three sections:

- **Section 1:** Demographic information (e.g., job title, department, years of experience)
- **Section 2:** Assessment of **S&OP Maturity**, including elements like cross-functional collaboration, executive engagement, and use of technology (Grimson & Pyke, 2007; Thome et al., 2012)
- **Section 3:** Measurement of **Inventory Management Efficiency**, focusing on indicators such as inventory turnover, demand accuracy, and stockout frequency (Chopra & Meindl, 2016)

Responses will be recorded using a **5-point Likert scale**, from “Strongly Disagree” to “Strongly Agree.”

Validity and Reliability

To ensure **content validity**, the questionnaire will be reviewed by academic and industry experts in supply chain management.

Reliability will be measured using **Cronbach’s Alpha**, with a threshold of 0.70 indicating acceptable internal consistency (Hair, Black, Babin, & Anderson, 2010).

Data Analysis Techniques

The data will be analyzed using **SPSS** software. The following statistical methods will be applied:

- **Descriptive statistics** to summarize respondent characteristics
- **Reliability analysis** using Cronbach’s Alpha
- **Pearson correlation** to explore relationships between variables
- **Linear regression** to test the impact of S&OP maturity on inventory management outcomes

These techniques are suitable for identifying patterns and testing hypotheses in quantitative research (Hair et al., 2010).

Study Hypotheses

Main Hypothesis

- **H₀**: There is no statistically significant relationship between S&OP maturity and inventory management efficiency.
- **H₁**: There is a statistically significant relationship between S&OP maturity and inventory management efficiency.

Sub-Hypotheses

- **H₀₁**: There is no significant relationship between S&OP maturity and inventory turnover.
- **H₀₂**: There is no significant relationship between S&OP maturity and forecasting accuracy.
- **H₀₃**: There is no significant relationship between S&OP maturity and stockout prevention.
- **H₀₄**: There is no significant relationship between S&OP maturity and inventory optimization across regions.

Chapter 4: Results and Recommendations

Introduction

This section presents the findings of the survey to examine the impact of Sales and Operations Planning (S&OP) maturity on inventory management efficiency. Participants came from diverse roles across demand planning, procurement, and operations, and their levels of experience ranged from less than 1 year to over 10 years.

The purpose of the study was to assess how key dimensions of S&OP maturity — such as cross-functional collaboration, leadership involvement, forecasting, and tool usage — influence inventory performance indicators including stock optimization, stockouts, turnover rates, and data-driven decision-making.

By analyzing the aggregated responses, the study aims to identify common maturity trends, pinpoint inefficiencies, and propose actionable recommendations for improving inventory outcomes through a more mature and integrated S&OP process.

Data Analysis

This study aimed to evaluate the impact of Sales and Operations Planning (S&OP) maturity on inventory management efficiency through a structured questionnaire distributed to professionals working in a pharmaceutical company. The analysis of responses is presented below across two main dimensions: S&OP maturity and inventory performance.

S&OP Maturity

Responses revealed a moderate to high level of agreement with key characteristics of a mature S&OP process. Most participants indicated the presence of regular cross-functional meetings and acknowledged active involvement from senior leadership. These elements are consistent with established S&OP maturity models, which highlight cross-functional collaboration and executive engagement as essential pillars of maturity (Grimson & Pyke, 2007; Thomé et al., 2012).

Moreover, many respondents reported the use of forecasting systems or ERP tools, though a minority disagreed—suggesting variability in digital infrastructure across organizations. Forecast accuracy and the regular updating of demand received mixed responses, indicating that while the structure of S&OP may be in place, execution remains inconsistent. This aligns with research noting that technical capabilities often lag behind process structure in early stages of S&OP implementation (Wagner, Ullrich, & Transchel, 2014).

Inventory Management Efficiency

Participants' responses on inventory management showed a generally positive outlook. Several respondents agreed that inventory levels are typically optimal, with stockouts being rare and inventory turnover described as healthy. These outcomes are typically associated with mature S&OP systems that enable synchronized planning and better inventory control (Noroozi & Wikner, 2017).

However, the accuracy of demand forecasts compared to actual customer demand was frequently rated as neutral or disagree. This gap suggests potential weaknesses in demand planning integration—a common issue in organizations still progressing through S&OP maturity stages (Lapide, 2005). Despite this, most participants indicated that their organizations regularly track

inventory metrics and make data-driven decisions, reflecting a culture of performance monitoring and continuous improvement.

Patterns and Associations

A qualitative review of the data revealed a trend: respondents who rated their S&OP processes more mature also tended to report stronger inventory performance (e.g., fewer stockouts, better turnover). This supports empirical findings that greater S&OP maturity contributes to inventory optimization by enhancing coordination, planning accuracy, and responsiveness (Oliva & Watson, 2011; Thomé et al., 2012). Conversely, weaker responses around demand planning and forecast alignment were often linked with inventory inefficiencies, such as inconsistent stock levels or poor forecast match.

Outcomes

The findings from this study demonstrate several key outcomes that underscore the relationship between S&OP maturity and inventory management efficiency.

Enhanced Organizational Alignment

One of the most notable outcomes is the confirmation that cross-functional collaboration, a hallmark of S&OP maturity, is present in most respondents' organizations. This indicates a foundational level of alignment between sales, operations, and supply chain teams. Such alignment is critical for translating strategic goals into operational plans and has been shown to positively influence forecast accuracy and supply-demand synchronization (Oliva & Watson, 2011).

Inventory Stability and Turnover Efficiency

Participants largely agreed that their inventory levels are typically within optimal ranges and that stockouts are rare. Additionally, responses indicated that inventory turnover is generally healthy. These outcomes reflect the benefits of having structured S&OP processes in place, which can reduce inventory variability and improve responsiveness to demand (Thomé et al., 2012; Noroozi & Wikner, 2017).

Identified Gaps in Forecast Accuracy

Despite positive feedback on several inventory KPIs, forecast accuracy emerged as a significant challenge. Many respondents were either neutral or disagreed with the statement that forecasts closely match actual customer demand. This gap suggests that while the structure for S&OP may exist, the execution—particularly the demand planning component—requires refinement. According to Wagner et al. (2014), forecast inaccuracy is often a sign of limited data integration and lack of advanced planning tools.

Variable Use of Tools and Systems

There was inconsistency in the use of advanced tools such as ERP systems or forecasting software, which may contribute to variation in planning quality across organizations. This finding reinforces the literature that emphasizes the importance of technological maturity in achieving high S&OP performance (Grimson & Pyke, 2007).

Link Between Maturity and Efficiency

Finally, a qualitative review of the responses suggests that higher levels of perceived S&OP maturity are correlated with better inventory performance. This aligns with existing research showing that mature S&OP processes contribute to lower safety stock requirements, improved service levels, and more effective inventory policies (Lapide, 2005; Thomé et al., 2012).

Recommendations

Based on the survey findings, the following recommendations are proposed to enhance S&OP maturity and improve inventory management efficiency:

1. Improve Forecast Accuracy

Organizations should focus on refining demand forecasting by using statistical models and reviewing forecasts regularly. Improved accuracy can help reduce stock imbalances and align supply with actual demand (Thomé et al., 2012; Noroozi & Wikner, 2017).

2. Invest in Planning Tools

Some responses indicated limited use of ERP or forecasting software. Expanding the use of integrated planning systems can improve visibility, coordination, and decision-making (Grimson & Pyke, 2007).

3. Strengthen Cross-Functional Collaboration

While regular meetings exist, improving the quality of communication and decision-making during S&OP cycles can enhance alignment between teams and reduce gaps in planning (Oliva & Watson, 2011).

4. Track Key Inventory Metrics

Organizations should consistently measure KPIs like inventory turnover, stockouts, and forecast accuracy. These metrics support performance monitoring and drive continuous improvement (Lapide, 2005).

5. Align S&OP with Strategic Goals

To maximize impact, the S&OP process should connect with broader business objectives, enabling better financial alignment and long-term planning (Wagner et al., 2014).

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Survey

Section 1: General Information

Please answer the following background questions:

1. What is your current job title? _____
2. Which department do you work in? _____
3. How many years of experience do you have?
☐ Less than 1 year ☐ 1–3 years ☐ 4–6 years ☐ 7–10 years ☐ More than 10 years

Section 2: S&OP Maturity

Please indicate your level of agreement with the following statements:

Statement	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
Our S&OP process includes regular cross-functional meetings involving sales, operations, and supply chain.	☐	☐	☐	☐	☐
Senior leadership is actively involved in the S&OP process.	☐	☐	☐	☐	☐
The S&OP process integrates data from multiple departments to support planning.	☐	☐	☐	☐	☐
Demand forecasts are reviewed and updated regularly through the S&OP process.	☐	☐	☐	☐	☐
We use advanced tools or software (e.g., forecasting systems, ERP) to support S&OP.	☐	☐	☐	☐	☐
Our supply and production plans are aligned with demand forecasts.	☐	☐	☐	☐	☐
The S&OP process includes continuous improvement and performance tracking.	☐	☐	☐	☐	☐
Departments collaborate to resolve gaps between supply and demand.	☐	☐	☐	☐	☐
The output of the S&OP process directly influences inventory and production decisions.	☐	☐	☐	☐	☐

Section 3: Inventory Management Efficiency

Please indicate your level of agreement with the following statements:

Statement	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
We maintain optimal inventory levels (neither too high nor too low).	☐	☐	☐	☐	☐
Stockouts are rare and well-managed.	☐	☐	☐	☐	☐
Our inventory turnover rate is healthy and consistent.	☐	☐	☐	☐	☐
Demand forecasts closely match actual customer demand.	☐	☐	☐	☐	☐

We regularly track and report inventory performance metrics.	☐	☐	☐	☐	☐
Inventory decisions are data-driven and coordinated across teams.	☐	☐	☐	☐	☐
Inventory is optimized across multiple regions/markets.	☐	☐	☐	☐	☐
We have a clear strategy for managing products with short shelf lives.	☐	☐	☐	☐	☐

Midocean University

College of Management

Department of Masters of Business Administration



Title in English/

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Year:2024