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Integrating Finance into S&OP: Towards IBP Scenario Planning and Optimization

Enhancing Business Planning for an Assembly-to-Order Truck
Global Manufacturing Organization

Master's thesis in Supply Chain Management

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SUMMARY

Modern manufacturing supply chains face increasing dynamic and detail complexity, requiring planning processes that align operational feasibility with financial outcomes. However, traditional Sales and Operations Planning (S&OP) often operate as a volume-driven process, leaving financial integration as a sequential, disconnected step. This thesis investigates how the alignment between operational volume planning and financial planning can be strengthened towards Integrated Business Planning (IBP).

Applying a combined theoretical lens of Contingency Theory and Organizational Information Processing Theory (OIPT), this single case study utilizes a mixed-methods approach encompassing semi-structured interviews, cross-functional workshops, and quantitative data modeling. The current-state analysis reveals three primary planning gaps: time misalignment, limited financial visibility, and a siloed planning execution.

To address these limitations, this study proposes a dual-mechanism response. First, an IBP process redesign is introduced to establish cross-functional governance and an integrated consensus routine. Second, an analytical proof-of-concept tool is developed to operationalize a "volume-to-economic value" translation, utilizing multi-period linear programming optimization and proactive scenario planning. The findings suggest that combining structural process changes with advanced analytical decision-support mechanisms can increase organizational information processing capacity. Ultimately, this proposed integrated approach aims to enable organizations to evaluate operational and financial trade-offs continuously, fostering proactive, profit-optimized decision-making in complex manufacturing environments.

Keywords: Sales and Operations Planning (S&OP), Integrated Business Planning (IBP), Contingency Theory, Organizational Information Processing Theory (OIPT), Scenario Planning, Optimization Models

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Maria & Cristhian, Gothenburg, June 2026

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List of Acronyms

Below is the list of acronyms that have been used throughout this thesis listed in alphabetical order:

ATO	Assembly-to-Order
BA	Business Area
BDAC	Big Data Analytics Capabilities
BEV	Battery Electric Vehicle
CAPEX	Capital Expenditure
FP&A	Financial Planning and Analysis
GI	Gross Income
GTO	Group Trucks Operations
GTP	Group Trucks Purchasing
GTT	Group Trucks Technology
HTO	Human-Tech-Org
IBP	Integrated Business Planning
ICE	Internal Combustion Engine
IPC	Information Processing Capacity
IPR	Information Processing Requirements
IT	Information Technology
KPI	Key Performance Indicator
MTO	Make-to-Order
MTS	Make-to-Stock
OIPT	Organizational Information Processing Theory
P&L	Profit and Loss
SEK	Swedish Krona
SKU	Stock-Keeping Unit
S&OE	Sales and Operations Execution
S&OP	Sales and Operations Planning
TTI	Trucks Technology & Industrial
VP	Vice President
VT	Volvo Trucks

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1

Introduction

This chapter introduces the background and context of the study, including the increasing need for stronger integration between operational and financial planning processes. It also presents the case company in which the study was conducted. Finally, the chapter outlines the aim of the study, the research questions, and the delimitations defining the scope of the thesis.

1.1 Background

Modern manufacturing companies operate in a highly complex business environment. Today's global supply chains face volatile demand and supply conditions, sudden market disruptions, and increasing pressures to reduce costs while maintaining high service levels (Lim et al., 2017). Furthermore, factors such as rapid technological advancements and shorter product life cycles create high "dynamic complexity" (Jonsson et al., 2021). Because of this continuous complexity and uncertainty, companies can no longer plan in isolated departments. There is a strong need for integrated planning processes to align daily supply chain operations with the company's long-term business strategy.

According to contingency theory, there is no single best way to design these organizational processes. Instead, planning processes must be carefully adapted to "fit" the specific complexities, size, and industry context of the company (Kristensen and Jonsson, 2018). When the business environment changes, the planning processes must also be adjusted to maintain this fit and ensure resilience (Wu et al., 2025).

The traditional solution to manage this supply chain complexity is Sales and Operations Planning (S&OP). S&OP is a tactical, cross-functional business process designed to balance a company's customer demand with its supply capabilities (Grimson and Pyke, 2007; Tuomikangas and Kaipia, 2014). It typically follows a monthly cycle that involves different functional departments such as sales, marketing, production, and supply chain, working together to agree on a single set of volume plans (Seeling et al., 2022).

While S&OP is effective at aligning supply and demand, it has notable limitations. Traditional S&OP is often heavily focused on operations and logistics, primarily dealing with product volumes and capacities rather than financial value (Selmi et al., 2021). As a result, financial impacts are not always fully integrated into the discussions, and operational decisions are not always evaluated based on their direct effect on profitability, margins, or the annual budget.

To overcome the limitations of traditional S&OP, many companies are evolving their processes into Integrated Business Planning (IBP). IBP is considered an advanced and mature form of S&OP that explicitly integrates financial planning and strategic objectives with operational planning (Schlegel et al., 2021). Unlike standard S&OP, IBP serves as a holistic management process designed to implement the company’s strategy (Nyman et al., 2025).

IBP helps companies evaluate cross-functional trade-offs by ensuring that the financial consequences of operational decisions are considered at every step of the process. For example, it provides a structured way to connect volume plans to financial performance indicators like revenue, production costs, and working capital (Selmi et al., 2021). By combining data from both the supply chain and financial departments, IBP supports senior management in making better strategic decisions.

To successfully connect operational and financial perspectives, IBP processes increasingly rely on analytical capabilities, shared data structures, and scenario-based decision support (Nicolas et al., 2021). A key differentiator between traditional S&OP and IBP is the ability to continuously evaluate how operational decisions influence financial outcomes and strategic objectives (Nyman et al., 2025). This requires mechanisms capable of translating operational assumptions, such as volumes, capacity allocations, and demand changes, into economically meaningful information that can support cross-functional decision-making.

Rather than evaluating operational feasibility and financial implications separately, IBP aims to create a more integrated planning environment where alternative scenarios and trade-offs can be assessed within the same planning process. In increasingly uncertain environments, this becomes important not only for operational coordination, but also for improving organizational visibility, supporting proactive decision-making, and enabling faster responses to changing business conditions (Van Hove and Regeer, 2021).

Despite the recognized importance of finance integration in IBP, many organizations still struggle to connect operational planning and financial planning in practice (Selmi et al., 2021). While mature S&OP processes and strong financial planning functions may coexist within the same organization, they often remain only partially integrated, operating with different planning structures, assumptions, and update frequencies. As a result, operational planning decisions are not always evaluated together with their financial implications in a timely and coordinated manner.

This study addresses this gap by examining how volume planning and financial planning can be more closely integrated within a complex industrial environment. In particular, the study focuses on how operational volumes can be translated into economic value and how analytical support can strengthen integrated and scenario-based decision-making towards Integrated Business Planning.

1.2 Case Company

The Volvo Group (officially AB Volvo), headquartered in Gothenburg, Sweden, stands as one of the world’s leading manufacturers of heavy commercial vehicles, diesel engines, and construction equipment. The company was officially founded on

April 14, 1927, by Assar Gabrielsson and Gustaf Larson. Throughout the mid-to-late 20th century, Volvo aggressively expanded its international footprint and cemented its reputation for safety and robust engineering. Today, the Volvo Group employs approximately 100,000 people and operates in nearly 190 markets. The contemporary strategic focus has shifted heavily towards sustainability, electrification, and autonomous transport solutions.

At the beginning of 2026 the group re-structured their hierarchy to effectively navigate the dynamic complexity of the modern industrial landscape. Historically operating through distinct professional domains, such as Group Trucks Operations (GTO), Group Trucks Technology (GTT), and Group Trucks Purchasing (GTP), the company has recently transitioned to a unified Trucks Technology & Industrial (TTI) structure.

Trucks Technology and Industrial (TTI) is Volvo Group's truck product and technology organization which operates as a global manufacturer serving multiple markets across their different Business Areas (BA) through several assembly plants worldwide. It now serves as a consolidated industrial entity responsible for the end-to-end integration of technology, purchasing, manufacturing, and logistics services.

Logistics is one of the major sub-divisions under TTI, this one is responsible for Sales and Operational Planning for all brands in Volvo Group to secure alignment between demand, supply, and business targets. Overall, they are responsible for inbound and outbound logistics, including purchasing logistics services, packaging, customs and trade for Volvo Group. The industrial organization aims to achieve economies of scale, maintain capacity flexibility, and enable a high degree of customer customization.

However, operating across multiple plants and markets increases planning complexity. Within this context, the company faces increasing uncertainty related to market conditions, competitive pressure, regulatory developments, and the transition towards new technologies and more sustainable transport solutions. In response, the company seeks improved visibility into how operational planning decisions translate into financial outcomes to support more coordinated, data-informed, and cross-functional decision-making between operational and financial planning functions.

1.3 Aim & Research Questions

The aim of this study is to analyze the current Sales and Operations Planning (S&OP) process and the associated financial planning processes in order to propose an integrated planning approach that strengthens the alignment between operational volume planning and financial planning towards Integrated Business Planning (IBP). In particular, the study seeks to improve organizational visibility of how tactical volume decisions translate into economic value and support more integrated and scenario-based decision-making.

To achieve this aim, the study addresses the following research questions:

RQ1. Which are the key interfaces between volume and financial planning?

RQ2. How can alignment between volume planning and financial planning be en-

hanced towards IBP?

- a) What gaps could be identified between the current planning processes and the context needs?
- b) How can an analytical tool support this integration?

1.4 Delimitations

To preserve a clear and focused research scope, this study establishes several boundaries regarding its depth, organizational coverage, and empirical application.

First, this thesis does not attempt to cover the full breadth of a company-wide Integrated Business Planning (IBP) transformation. Instead, the work is explicitly restricted to the process interfaces, structural changes, and analytical capabilities required to achieve a "volume-to-economic value" translation and resolve planning misalignments between operations and finance. Consequently, while the study details specific process modifications—such as proposing clear cross-functional process ownership and an integrated consensus routine—wider organizational behaviors are kept out of scope. Broader corporate themes such as individual decision-making behaviors, human resource impacts, employee psychology, and full-scale change management execution are not analyzed as primary research tracks. Furthermore, this research focuses on analyzing process structures and designing a new planning setup, meaning that evaluating the long-term, empirical performance outcomes of this design is outside the scope of this study.

Second, the empirical scope of this research is strictly limited to tactical planning scenarios within European manufacturing plants and European sales areas, focusing specifically on heavy-duty truck segments.

Finally, the analytical component developed in this study is bounded as a proof of concept rather than a production-grade application. The underlying mathematical model operationalizes the volume-to-value translation using a profit logic based on prices and operational costs, making it suitable for comparing tactical business scenarios side-by-side rather than producing accounting-level financial statements. The model focuses exclusively on industrial cost drivers that can be linked directly to volume allocation choices, such as production, logistics, and short-term operational flexibility costs. Several commercial and strategic levers remain out of scope to preserve focus; price management, market share dynamics, and opportunity cost modeling are excluded. Similarly, end-to-end IT implementation topics—such as live system integration, master data governance design, and software deployment—are excluded from the technical scope.

2

Literature Review

This chapter reviews the literature relevant to the study and provides the theoretical foundation for the analysis. It outlines the evolution of S&OP and IBP, examines contingency theory and financial integration in planning, and discusses the role of advanced analytics in IBP. The chapter concludes by combining contingency theory and OIPT as the theoretical perspective guiding this research.

2.1 Evolution of S&OP

2.1.1 Foundations of S&OP

Sales and Operations Planning was initially introduced in the 1980s by Ling and Goddard (1988) as a solution to coordinate split functional activities within manufacturing companies. Fundamentally, S&OP is defined as a cross-functional business process aimed at balancing a company's supply and demand while simultaneously linking strategic corporate plans to daily operational execution (Grimson and Pyke, 2007). Fakhry et al. (2025) describe that the main purpose of S&OP is to integrate various business plans, including sales, manufacturing, sourcing, and finance, into one unified and coherent set of plans.

To achieve this alignment, S&OP requires both horizontal and vertical integration (Tuomikangas and Kaipia, 2014). Horizontal alignment ensures that demand forecasts are balanced with supply capabilities across different functional departments. Vertical alignment guarantees that short-term, day-to-day operational tasks are guided by the organization's long-term strategic and financial goals. S&OP operates at a tactical level, typically through a monthly planning cycle with a rolling horizon of 3 to 18 months, and in some cases up to 24 months (Grimson and Pyke, 2007). Because of this medium-term horizon, S&OP planning is generally conducted at an aggregated level, such as product families, rather than at the individual stock-keeping unit (SKU) level.

In practice, the process commonly includes demand planning, supply planning, reconciliation, and executive review activities aimed at creating a consensus plan across functions (Wallace, 2004).

2.1.2 S&OP Maturity Models

Although the S&OP process is conceptually straightforward, implementing it successfully is a highly complex task that involves multiple organizational levels and

requires linking adversarial departments (Pedroso et al., 2016). Consequently, many companies struggle to move beyond basic planning, prompting scholars and practitioners to develop S&OP maturity models. Danese et al. (2018) explain that these maturity models outline a developmental path consisting of successive evolutionary stages, helping organizations assess the current effectiveness of their S&OP capabilities and providing a roadmap to reach advanced integration.

While various maturity models exist, they universally outline a progression from reactive, fragmented processes towards proactive, fully integrated planning environments (Grimson and Pyke, 2007; Lapide, 2005). Evolution is typically evaluated across several core dimensions: People and Organization (team structures and cultural commitment), Process and Methodologies (meeting regularity and formalization), Information Technology (software and data integration), and Performance Measurement (KPIs and metrics) (Danese et al., 2018).

To assess how planning capabilities evolve over time, Grimson and Pyke (2007) and Danese et al. (2018) describe S&OP maturity as a progression through five stages. The stages illustrate how organizations gradually move from fragmented planning environments towards more integrated and proactive planning processes across organizational, process, technological, and performance dimensions. Table 2.1 summarizes the main characteristics of each maturity stage.

The maturity perspective is relevant for this study because it provides a framework for understanding how organizations evolve from traditional S&OP towards Integrated Business Planning (IBP). While the earlier maturity stages focus primarily on achieving internal alignment between demand and supply, the later stages increasingly emphasize financial integration, scenario planning, executive involvement, and profitability-based decision making. These characteristics closely resemble the key principles associated with IBP in the literature (Selmi et al., 2021; Nyman et al., 2025).

Consequently, the transition towards IBP can be interpreted as a continuation of the S&OP maturity journey rather than as a completely separate planning approach (Mysłowska-Płaszewska and Dudek, 2025). For the purpose of this study, the maturity model provides a useful reference point for understanding how the integration of finance, scenario evaluation, and analytical decision support can contribute to advancing planning capabilities towards IBP.

Dimensions	Stage 1: No S&OP	Stage 2: Reactive	Stage 3: Standard	Stage 4: Advanced	Stage 5: Proactive
Organization	Functional "silos" dominate; there is no S&OP team and a lack of executive sponsorship.	Some collaboration occurs between demand and operations, but roles and responsibilities remain undefined.	A formal, cross-functional S&OP team is established with clear roles, responsibilities, and commitment.	Executive management actively participates; collaboration extends externally to include key suppliers and customers.	The S&OP process owner coordinates the entire network, with top management participation from partnering companies.
Process	No formal S&OP meetings or procedures exist; planning is fragmented.	The process is emerging but inconsistent and informal, primarily driven by short-term financial goals.	Regular, structured meetings (e.g., monthly) take place to balance supply and demand plans.	The process balances internal plans with the external network; financial integration begins.	Meetings become dynamic and event-driven, responding to real-time changes to optimize corporate profit.
Technology	High reliance on individual, disconnected spreadsheets.	Data consolidation begins but is done manually across many spreadsheets.	Centralized, integrated demand and supply planning software replaces individual spreadsheets.	Technologies allow for external data sharing and scenario planning (what-if analysis).	Innovative, real-time technology supports joint optimization of revenue and operations.
Performance	Metrics are strictly functional, with no shared organizational goals.	Measures typically evaluate how well Operations meet the Sales plan.	Integrated internal metrics are used, such as forecast accuracy and supply chain trade-offs.	Metrics evaluate overall S&OP effectiveness and new product introductions.	Focus shifts to corporate profitability and the impact on the broader business ecosystem.

Table 2.1: The Five Stages of S&OP Maturity (Grimson and Pyke, 2007; Danese et al., 2018)

2.2 Contingency Theory in S&OP Design

2.2.1 The Contingency Perspective

While standard maturity models offer a roadmap for improving planning capabilities, scholars argue that generalized best practices are not universally applicable to all organizations (Kristensen and Jonsson, 2018; Sousa and Voss, 2008). To understand why implementations succeed or fail, researchers rely on contingency theory. Contingency theory argues that there is no single best way to design an organizational process; rather, an organization's success depends on achieving a proper "fit" between its design and its specific environment (Kristensen and Jonsson, 2018).

Specifically, contingency research focuses on the connection between three key variables: contextual, response, and performance variables (Sousa and Voss, 2008).

- Contextual variables: represent the unique internal and external environment or contingencies a firm faces.
- Response variables: refer to the actual S&OP design choices a company makes to adapt to its environment, such as its meeting structures, organization, information technology, and planning parameters.
- Performance variables: measure the resulting intended or unintended efficiency and effectiveness of the S&OP process (Hulthén et al., 2016).

According to this perspective, when a company aligns its response variables (S&OP design) with its specific contextual variables, it achieves better performance. Consequently, mismatches between the chosen process design and the company's unique environment often led to implementation difficulties or outright failures (Lawrence and Lorsch, 1967).

2.2.2 Moving Beyond Standard Models

Because of these contextual differences, many companies struggle to realize the promised benefits of S&OP when they attempt to implement a generic framework (Jonsson et al., 2021). The standard, "one-size-fits-all" descriptions found in popular S&OP maturity models are often inadequate for representing all business environments. Research clearly indicates that simply copying an established, rigid framework does not guarantee the intended performance outcomes (Lapide, 2004; Wagner et al., 2014). Furthermore, S&OP was traditionally not designed to be an adaptive process, meaning standard frameworks often fail to reflect environments under continuous change. Therefore, academics emphasize that standard S&OP frameworks must be uniquely adapted and designed to fit the individual characteristics and specific problem context of each firm (Jonsson et al., 2021).

2.2.3 Contextual Variables

Literature identifies several contextual variables that influence how S&OP processes should be designed. Based on the framework proposed by Kristensen and Jonsson (2018), this study focuses on six contextual variables that are relevant for understanding the integration between operational and financial planning.

- **Industry Type:** Although S&OP is applicable across various sectors, its detailed design, such as the required planning horizon, the specific software tools used, and the planning parameters, must be fitted to the specific planning environment of a given industry.
- **Dynamic Complexity:** This variable refers to uncertainty and volatility in demand, supply, and market conditions. Higher levels of uncertainty increase the need for adaptive planning mechanisms, scenario evaluation, and risk management capabilities (Singh and Lee, 2013).
- **Detail Complexity:** Represents the number of products, plants, suppliers, and other elements that must be coordinated. Organizations facing high detail complexity often need to divide their S&OP into multiple, manageable sub-processes (Thomé et al., 2014). High detail complexity also drives the need for advanced Information Technology (IT) and planning systems to handle the massive amount of data required (Chae and Olson, 2013; Wells, 2015).
- **Manufacturing Strategy:** Firms utilize different strategies, such as make-to-stock (MTS) or make-to-order (MTO), which dictate how they balance supply and demand. For instance, MTS strategies often rely on inventory buffers and level scheduling, whereas MTO strategies depend on capacity flexibility and chase scheduling (Olhager and Rudberg, 2002).
- **Hierarchical Planning Framework:** S&OP operates within a broader planning hierarchy, linking strategic, tactical, and operational planning levels. Effective coordination across these levels is important to ensure that tactical plans are aligned with both long-term objectives and short-term execution activities (Lapide, 2017).
- **Organizational Characteristics:** S&OP design is influenced by human and structural factors, including culture, top management support, and the existing hierarchical planning framework (Swaim et al., 2016). A rigid, siloed organization may act as a barrier to the collaboration required for S&OP, necessitating structural adjustments to succeed (Pedroso et al., 2016).

These contextual variables influence not only the structure of S&OP processes, but also the requirements for integrating operational and financial planning. As planning complexity increases, organizations require stronger mechanisms for translating, aligning, and evaluating information across different planning domains.

2.3 Organizational Information Processing Theory

While contingency theory explains why planning processes must fit their organizational context, it provides less detail regarding how organizations cope with the increasing information demands created by more integrated planning environments. To address this, Organizational Information Processing Theory (OIPT) provides a complementary perspective.

OIPT provides a lens for understanding how planning processes perform under conditions of uncertainty, equivocality and cross-functional interdependence. The cen-

tral premise of OIPT is that organizational performance depends on the fit between the information processing requirements (IPR) created by a task environment and the information processing capacity (IPC) available to address them (Galbraith, 1974; Tushman and Nadler, 1978). IPR refers to the amount and complexity of information that must be processed to make sound decisions, while IPC refers to the organization’s ability to collect, integrate, interpret and use that information effectively. In this theoretical context, decision quality relates to the effectiveness of choices made by resolving task uncertainty with an optimal amount of relevant, accurate, and timely information, avoiding both sub-optimal decisions caused by information deficits and redundant coordination costs from excessive processing (Tushman and Nadler, 1978; Schlegel et al., 2021). When IPR exceeds IPC, decision-making quality deteriorates; conversely, improved fit between the two supports more effective organizational performance.

In the context of S&OP and IBP, OIPT is relevant because more integrated planning increases both the volume and diversity of information that must be processed across functions. As organizations move from traditional volume-oriented planning towards more mature planning approaches such as IBP, they must reconcile operational, financial, and strategic information within the same planning process. Schlegel et al. (2021) show that this transition increases information-processing requirements through implementation-related uncertainty, cross-functionality-related uncertainty, and supply and demand uncertainty. From an OIPT perspective, mechanisms such as analytics, data integration, common planning platforms, and cross-functional planning routines can therefore be understood as ways of increasing information-processing capacity and improving planning effectiveness.

This perspective is relevant for the present study, where volume planning and financial planning operate as interconnected but distinct planning domains. The integration of these domains requires the translation, alignment, and evaluation of information characterized by different structures, time horizons, and decision logics. OIPT therefore complements contingency theory by explaining how contextual planning requirements create demands for information processing and why planning effectiveness depends on the organization’s capacity to address those demands.

2.4 Integrating Volume and Financial Planning

2.4.1 Integrated Business Planning

Integrated Business Planning (IBP) is commonly presented as the most mature form of S&OP, extending the traditional focus on balancing demand and supply into a broader business-steering process that connects operational planning with strategy and financial outcomes (Seeling et al., 2022; Shanahan et al., 2025). In this sense, IBP retains S&OP’s tactical balancing logic, but expands its scope, horizon, and decision agenda so that the process can be used to deploy strategy and make trade-offs visible to the organization’s senior decision makers (Nyman et al., 2025).

A consistent theme across the literature is that IBP is defined less by a single “new” step and more by integration: across functions (sales, operations, marketing, finance), across planning horizons (tactical to strategic), and in mature cases across

organizational boundaries (customers, suppliers) (Shanahan et al., 2025; Thomé et al., 2012). Schlegel et al. (2021) define IBP as a cross-functional business planning process resulting in a common set of tactical and strategic goals for profit optimization, with the involvement of customers and suppliers. This highlights that it extends standard S&OP’s supply-demand balancing character with stronger cross-functional and cross-enterprise integration and a more explicit profitability perspective. In a similar direction, Selmi et al. (2021) frame the evolution to IBP around key differentiators that create a business-steering capability: explicit financial integration, the inclusion of product and portfolio management, scenario analysis for risk and opportunity management, and end-to-end supply chain collaboration.

Process-wise, IBP is often described as an expanded cadence around the classic monthly S&OP cycle. Nyman et al. (2025) argue that the product portfolio review and integrated reconciliation are two process steps typically not found in traditional S&OP that act as key differentiators. The product management review formalizes lifecycle and strategic assumptions that drive the downstream demand plan, while integrated reconciliation acts as a continuous activity where demand, constrained supply, and financial plans are aligned, and gaps are mitigated through scenario planning (Nyman et al., 2025; Selmi et al., 2021). This emphasis on reconciliation resonates with the broader view that IBP’s purpose is not merely to generate “a plan,” but to reach a cross-functional agreement and create one aligned, decision-ready set of numbers that supports trade-offs and accountability at the enterprise level (Selmi et al., 2021; Shanahan et al., 2025; Tuomikangas and Kaipia, 2014).

Finally, it is important to acknowledge a recurring methodological point: academic definitions of IBP are less standardized than those of S&OP, as IBP has historically been shaped strongly by practitioner frameworks and consultancy practice (Schlegel et al., 2021; Nyman et al., 2025). For research purposes, this implies that IBP should be operationalized via observable characteristics such as the inclusion of portfolio/lifecycle reviews, explicit financial integration and reconciliation, scenario-based decision support, executive ownership, and a documented governance cadence that links tactical plans to strategic decision making (Nyman et al., 2025; Selmi et al., 2021; Shanahan et al., 2025).

2.4.2 Finance Integration and Value Translation

Finance is increasingly positioned in the S&OP and IBP literature as a critical integration mechanism for transforming a volume-oriented planning process into a business-oriented process with explicit profitability and investment trade-offs (Selmi et al., 2021; Seeling et al., 2022). This integration requirement becomes clearer when contrasted with the objectives of Financial Planning and Analysis (FP&A), which generally focus on budgeting, forecasting, resource allocation, and financial control (Subrahmanyam et al., 2024). Because functions approach forecasting from different perspectives—operations focusing on capacity, sales on market demand, and finance on top-down revenue—integration is fundamentally a reconciliation problem rather than a simple data exchange (Oliva and Watson, 2011). In mature IBP environments, finance moves beyond acting as a final validation step and instead actively participates in demand and supply planning, scenario evaluation, and exec-

utive decision-making (Danese et al., 2018; Grimson and Pyke, 2007; Nyman et al., 2025; Seeling et al., 2022).

The primary mechanism for achieving this cross-functional alignment is the systematic translation of volume to economic value, which involves converting operational plans expressed in physical units into financial consequences so that cross-functional trade-offs can be evaluated on a comparable basis. Selmi et al. (2021) identify four key interfaces connecting volume and financial planning: using volume plans for revenue and cost budgeting, continuously translating volumes to identify emerging P&L gaps, projecting CAPEX requirements, and managing working capital through inventory decisions.

Crucially, this translation is not merely a late-stage technical calculation, but a proactive decision-support mechanism (Seeling et al., 2022; Selmi et al., 2021). When demand or supply discussions remain solely in physical units, it becomes difficult to compare alternatives that differ in margin structure or cost exposure (Seeling et al., 2022). By translating operational scenarios into revenue, cost, and margin implications, finance helps the organization assess commercial initiatives, evaluate supply mitigation options (such as overtime or alternative sourcing), and prepare executive decision-making with financially evaluated options (Fakhry et al., 2025; Seeling et al., 2022).

However, operationalizing this financial integration becomes increasingly demanding as planning contexts grow in complexity. Schlegel et al. (2021) argue that as IBP expands the planning scope across more functions and longer horizons, it significantly increases the amount and complexity of information that must be processed. From an Organizational Information Processing Theory (OIPT) perspective, this requires shared data structures and cross-functional coordination to prevent a dual-role tension where finance acts strictly as a controller rather than an integrated business partner (Seeling et al., 2022). Consequently, fully integrated analytical models are necessary to align these highly complex plans effectively across functions (Nicolas et al., 2021), enabling the generation of "financialized scenarios" that support uncertainty management at a tactical level (Fakhry et al., 2024).

2.5 Advanced Analytics for IBP

2.5.1 Analytical Capabilities and Scenario Planning

Advanced analytical capabilities are increasingly positioned in the S&OP and IBP literature as necessary mechanisms for supporting integrated planning (Nicolas et al., 2021; Sengupta et al., 2025). Contingency-based S&OP research argues that increasing dynamic complexity and detail complexity fundamentally change the requirements placed on planning processes and supporting systems (Kristensen and Jonsen, 2018). In parallel, Organizational Information Processing Theory (OIPT) suggests that more integrated planning environments increase information-processing requirements because larger amounts of operational and financial information must be coordinated across functions (Schlegel et al., 2021). Together, these perspectives indicate that analytical capabilities are necessary mechanisms for maintaining alignment between planning requirements and organizational capabilities.

Empirical evidence reinforces this argument, showing that implementing IBP increases both the amount and variety of information that must be consolidated, while big data analytics capabilities (BDAC) improve planning efficiency and effectiveness (Schlegel et al., 2021). These capabilities enhance data quality, forecast accuracy, and visibility of cross-functional trade-offs, while reducing manual planning activities. Importantly, such capabilities depend not only on technology, but also on organizational structures, human skills, and data-driven ways of working (Danese et al., 2018; Nicolas et al., 2021).

A primary application of these capabilities is scenario planning, which enables organizations to explore alternative futures and evaluate how different operational assumptions translate into feasible plans and business outcomes. Within contingency-based S&OP research, scenario planning is repeatedly highlighted as a key response mechanism to increasing uncertainty and dynamic complexity (Kristensen and Jonsson, 2018). As reliance on a single consensus plan becomes more fragile, organizations require mechanisms capable of evaluating risks, alternatives, and trade-offs under changing conditions. Consequently, Fakhry et al. (2024) argue that decision-support systems must support “what-if” scenario generation and financial evaluation at a tactical planning level.

From an IBP perspective, scenario planning becomes important because it connects operational planning discussions directly with financial outcomes. Finance contributes by evaluating alternative scenarios in terms of revenue, cost, and margin implications, while supporting decisions related to mitigation options such as overtime, premium freight, alternative sourcing, and capacity adjustments (Seeling et al., 2022). By translating operational alternatives into financial consequences, organizations can evaluate trade-offs on a common basis.

Finally, recent literature emphasizes that scenario planning should be embedded as a continuous capability within the planning process rather than treated as an isolated exercise during major disruptions (Sengupta et al., 2025; Wu et al., 2025). In this context, analytical capabilities support continuous learning, the evaluation of alternative responses, and the adaptation of planning processes as business conditions and assumptions evolve (Jonsson et al., 2021; Sengupta et al., 2025).

2.5.2 Optimization Models

In advanced S&OP and IBP environments, optimization models represent the analytical foundation for integrating operational and financial decision-making (Nicolas et al., 2021). Unlike traditional planning approaches that evaluate demand, production, and distribution separately, integrated optimization models align multiple planning dimensions towards common operational and financial objectives (Lim et al., 2017; Saccomanno et al., 2026). These models support the evaluation of trade-offs across constraints such as production capacity, procurement lead times, logistics costs, and service levels while incorporating financial performance considerations into planning decisions.

Simulation-based optimization combines “what-if” scenario evaluation with optimization techniques to explore alternative planning decisions under dynamic conditions (Aiassi et al., 2020). In this sense, optimization models move financial eval-

uation from a final reporting activity towards a core planning objective embedded directly within the decision-making process.

Recent research increasingly positions optimization models as mechanisms for operationalizing financially integrated and scenario-based planning. Fakhry et al. (2024) propose decision-support systems capable of generating “financialized scenarios” by combining tactical planning calculations with explicit financial evaluation. Similarly, Abbasi et al. (2025) demonstrate how optimization models can integrate operational and financial flows to evaluate supply chain scenarios under highly disruptive conditions. Together, these studies position optimization models as key analytical mechanisms for supporting integrated business planning and translating operational decisions into financial outcomes.

2.6 Linking Contingency Theory and OIPT

Contingency Theory and Organizational Information Processing Theory (OIPT) are used as complementary theoretical perspectives in this study. Contingency Theory provides the broader logic that planning processes should be designed to fit the context in which they operate (Kristensen and Jonsson, 2018), while OIPT is used as a secondary perspective that explains that organizations operate under varying levels of uncertainty and complexity, which generate different information-processing requirements (Shurrab and Jonsson, 2026). As these requirements increase, organizations must develop mechanisms that enable them to process information effectively in order to support decision-making. Together, the two theories help explain why certain planning environments require stronger organizational and analytical mechanisms than others. Figure 2.1 illustrates how the two theories are linked in this research.

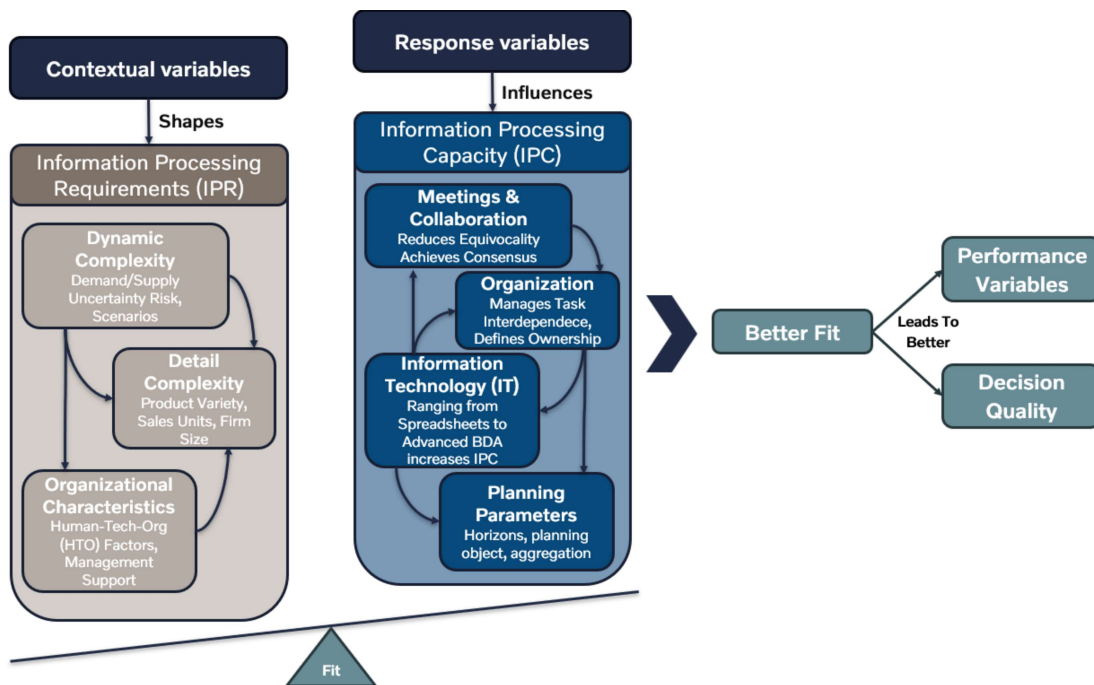


Figure 2.1: Combined Theories

As illustrated in the figure, contextual variables are interpreted as factors that shape the organization's information-processing requirements. For example, dynamic complexity may increase uncertainty regarding future demand and market conditions, while detail complexity may increase the volume of information that must be coordinated across products, markets, plants, and functions. Similarly, hierarchical planning frameworks and organizational characteristics influence how information flows across planning levels and organizational boundaries.

Response variables, in turn, represent the organizational actions and design choices implemented to address contextual challenges. These response variables include meeting and collaboration structures, organizational arrangements, information technology, and planning parameters (Kristensen and Jonsson, 2018). From an OIPT perspective, such response variables can be interpreted as mechanisms that increase information-processing capacity by improving the organization's ability to generate, communicate, interpret, and evaluate planning information (Shurrab and Jonsson, 2026).

The level of fit represents the degree of alignment between information processing requirements and information processing capacity. A higher level of fit is expected to support stronger planning performance and better decision quality (Kristensen and Jonsson, 2018; Schlegel et al., 2021). This combined perspective is particularly relevant for the present study, as the integration of financial and volume planning increases both cross-functional interdependencies and the need to translate heterogeneous planning information into a coherent basis for decision-making. The combined lens therefore helps explain not only why the current planning design may become insufficient under certain contextual conditions, but also why improved process interfaces and analytical support may increase the organization's ability to cope with those demands.

Together, contingency theory and OIPT provide a complementary framework for understanding why the integration between operational and financial planning becomes increasingly challenging in complex planning environments and why stronger analytical and cross-functional mechanisms may be required to support integrated decision-making. In this study, the combined framework is used to analyze both the limitations of the current planning design and the proposed mechanisms intended to strengthen alignment between volume planning and financial planning towards IBP.

3

Methodology

This chapter describes the methodology used in this study. It includes the research approach and data collection methods that were used to answer the research questions. Additionally, the chapter discusses the reliability and validity considerations as well as the ethical aspects relevant to the study.

3.1 Research Approach

The relationship between theory and empirical work in business research is often described in terms of deductive and inductive reasoning, although these are best viewed as tendencies rather than strict categories (Bell et al., 2022). In this study, the research process is primarily problem-driven and iterative, moving between empirical observations, emerging insights, and analytical formulation. In practice, this meant that early qualitative engagement with the operational setting informed what should be modelled, how variables should be defined, and what constraints mattered for planning. As the empirical understanding developed, the modelling approach and data requirements were refined accordingly.

This iterative movement between empirical material and the development of an explanatory and prescriptive model is consistent with the idea that business research may proceed through cycles of engagement with data and refinement of the analytical framing, rather than following a purely linear “theory-first” sequence (Bell et al., 2022).

The research design is a single case study, selected to enable an in-depth investigation of a specific operational context and the development of a solution tailored to that context. Single case studies are appropriate when the goal is depth, contextual understanding, and detailed insight into processes and organizational mechanisms rather than broad statistical generalization (Gustafsson, 2017). This approach is suitable for this research, as it aims to explore and improve the integration between S&OP and financial planning within a real organizational setting.

A known limitation of single case studies is that findings may be challenged in terms of generalizability beyond the focal setting. To address this, the study provides a detailed account of the case context and its operational characteristics so that readers can assess the transferability of insights to other settings with similar conditions (Gustafsson, 2017). The intention is therefore not to claim universal applicability, but to generate empirically grounded insights and a clearly specified approach that others can evaluate and adapt.

3.2 Data Collection

The data collection phase is an important component of the research design, as it provides the empirical foundation necessary to address the research questions. To ensure a comprehensive understanding of the complex S&OP and financial planning processes at Volvo, this study utilized a combination of primary and secondary data sources.

3.2.1 Primary Data

Primary data was gathered directly from the source to explore the specific context of Volvo's operations. This was achieved through two main qualitative methods: semi-structured interviews and interactive workshops. In addition, informal meetings and follow-up discussions were conducted throughout the project to clarify insights, validate interpretations, and address emerging questions.

3.2.1.1 Interviews

Primary data was mainly collected through semi-structured interviews with key stakeholders involved in S&OP and financial planning processes. Semi-structured interviews allow flexibility while still ensuring that relevant topics are covered, which is useful when exploring complex organizational processes (Bell et al., 2022).

Since the study focuses on the integration between operational and financial planning, data collection intentionally included stakeholders from both operational and financial planning domains in order to capture different planning perspectives, assumptions, and information flows across functions.

An interview guide was prepared for each session, focusing on understanding processes such as S&OP planning, cost calculation, and financial estimation. However, the format allowed follow-up questions depending on the expertise of each participant. This approach is consistent with qualitative research practices, where flexibility helps capture detailed insights and context (Bell et al., 2022).

Most interviews were conducted on-site at Volvo facilities to facilitate interaction and understanding of the context, with some remote sessions for stakeholders located in other Volvo Group locations. During the interviews, detailed notes were taken, and the gathered data was subsequently mapped to identify key process interfaces and variables.

The interviews covered multiple functions and roles to ensure a comprehensive understanding of both operational and financial perspectives. This supports triangulation by gathering data from different stakeholders and viewpoints, which increases the credibility of the findings (Creswell and Miller, 2000).

The main interviews conducted are summarized in the Table 3.1 below:

Table 3.1: Summary of Semi-Structured Interviews

Topic	Role	Date
Profit Calculation Process	VP Business Controller VT	21 Jan 2026
S&OP Process	S&OP Volume Capacity Manager	23 Jan 2026
Long-Term Financial Plan	Business Controller TTI	26 Jan 2026
S&OP Process (Follow-up)	S&OP Volume Capacity Manager	29 Jan 2026
Cost of Sales Calculation Process and Standard Cost	VP Product Cost Control	02 Feb 2026
Price Adjustment and Profit Allocation	Business Controller VT	03 Feb 2026
Cost Model and Cost Variables Identification	Business Controller TTI	03 Feb 2026
Freight Cost Process and Variables	Business Data Analyst	06 Feb 2026
Financial Estimates Process	Business Controller VT	24 Feb 2026
Estimate Variance Analysis	Business Controller TTI	02 Mar 2026
Cost Validation	VP Business Controller	03 Mar 2026
Data Modeling	Logistics Data Engineer	06 Mar 2026

In addition to the formal interviews, nine informal meetings were conducted throughout the project to address emerging questions and clarify process logic, validate interpretations, and refine the understanding of cross-functional planning interactions. Some of these meetings involved stakeholders not included in the interview table, providing additional perspectives and validation of the findings. These interactions helped refine the interpretation of the processes and supported continuous data collection.

3.2.1.2 Workshops

Besides individual interviews, two workshops of approximately 90 minutes each, were conducted to validate findings and co-develop solutions with stakeholders. Workshops are useful in case study research as they allow interaction, alignment, and feedback from multiple participants at the same time (Bell et al., 2022).

- Workshop 1 – IBP Overview and Process Proposal (19/02/2026)

This workshop focused on presenting and discussing the current-state analysis and the proposed IBP process. The session included discussions on the definition of IBP from both literature and practitioner perspectives, an overview of the IBP concept, its role in increasing resilience within the S&OP process, and the identified current processes and interfaces. The proposed process was also presented, including its expected value for different stakeholders.

The outcome of the workshop confirmed that the proposed process was suitable for integrating financial data into the S&OP process. Feedback from participants was used to refine the process design. Participants included the Director S&OP, Global & Capacity Manager, BA Business Controllers, and Logistics Data Scientist (feedback from the TTI Business Controller was gathered subsequently).

- Workshop 2 – Volume to Value Translation (01/04/2026)

This workshop focused on validating and discussing the translation from volume planning to financial outcomes. The session included discussions on the agreed IBP process, general model assumptions, and the logic of the analytical model, including the proof of concept.

The outcome of the workshop confirmed that the logic used to translate volumes into economic value was appropriate and supported further development of the model. Key assumptions were discussed and adjusted based on stakeholder input. Participants included the Director S&OP, Global & Capacity Manager, BA Business Controllers, and the TTI Business Controller (feedback from the Logistics Data Scientist was gathered beforehand).

Workshops also contributed to collaborative validation, where participants actively reviewed and confirmed interpretations, increasing the credibility of the results (Creswell and Miller, 2000).

3.2.2 Secondary Data

Secondary data involves the analysis of data that has already been collected by others (Bell et al., 2022). This is essential for building a theoretical foundation and understanding the organizational backdrop without the time and cost required to gather such background data from scratch.

3.2.2.1 Literature and Theoretical Frameworks

An extensive literature review was conducted to support both the analysis and model development. The main topics included Sales and Operation Planning (S&OP), Integrated Business Planning (IBP), financial planning, scenario-based optimization,

Contingency Theory and Organizational Information Processing Theory (OIPT).

The purpose of the literature review was not only to summarize existing knowledge but also to critically assess and connect different concepts relevant to the research problem (Knopf, 2006). This helped to build a theoretical foundation for identifying process gaps and designing the proposed solution.

3.2.2.2 Volvo Data

Secondary data from Volvo was used to complement the primary data and support the model development. This included:

- Annual Reports (2024–2025)
- Internal S&OP and financial planning materials
- Data shared by stakeholders related to costs, demand, and logistics

This data was used to understand existing structural and financial context as well as their business performance, validate assumptions, and quantify key variables used in the analytical model.

3.3 Model of Analysis

The model of analysis describes the specific and sequential procedures used to reduce and interpret raw data to answer the research questions, as illustrated in Figure 3.1. The analysis followed a structured and iterative approach, moving back and forth between primary data collected at Volvo and secondary data from literature and company reports.

Figure 3.1 illustrates how the research process was structured across the different research questions. The analysis began with the mapping of Volvo’s current volume planning and financial planning processes and the identification of their key interfaces. This was followed by the identification of contextual variables and planning gaps affecting the interaction between the two planning domains. While the figure presents these activities sequentially, several iterations occurred throughout the study. Findings from the current-state analysis informed additional literature reviews on IBP, financial integration, and contingency-based planning design, while theoretical insights from the literature were used to refine the interpretation of empirical findings and support the identification of planning gaps.

Based on these findings, an integrated planning process was proposed to define how operational and financial perspectives could be better integrated within the planning process. The analysis then continued with the definition of the integration logic between volume and financial planning and the subsequent development and validation of an analytical tool to support integrated and scenario-based decision-making. Feedback obtained during workshops was used to validate and adjust both the proposed process and the analytical tool, creating an iterative movement between empirical observations, theory development, and solution design.

The grey boxes indicate the primary and secondary data sources supporting each stage of the analysis.

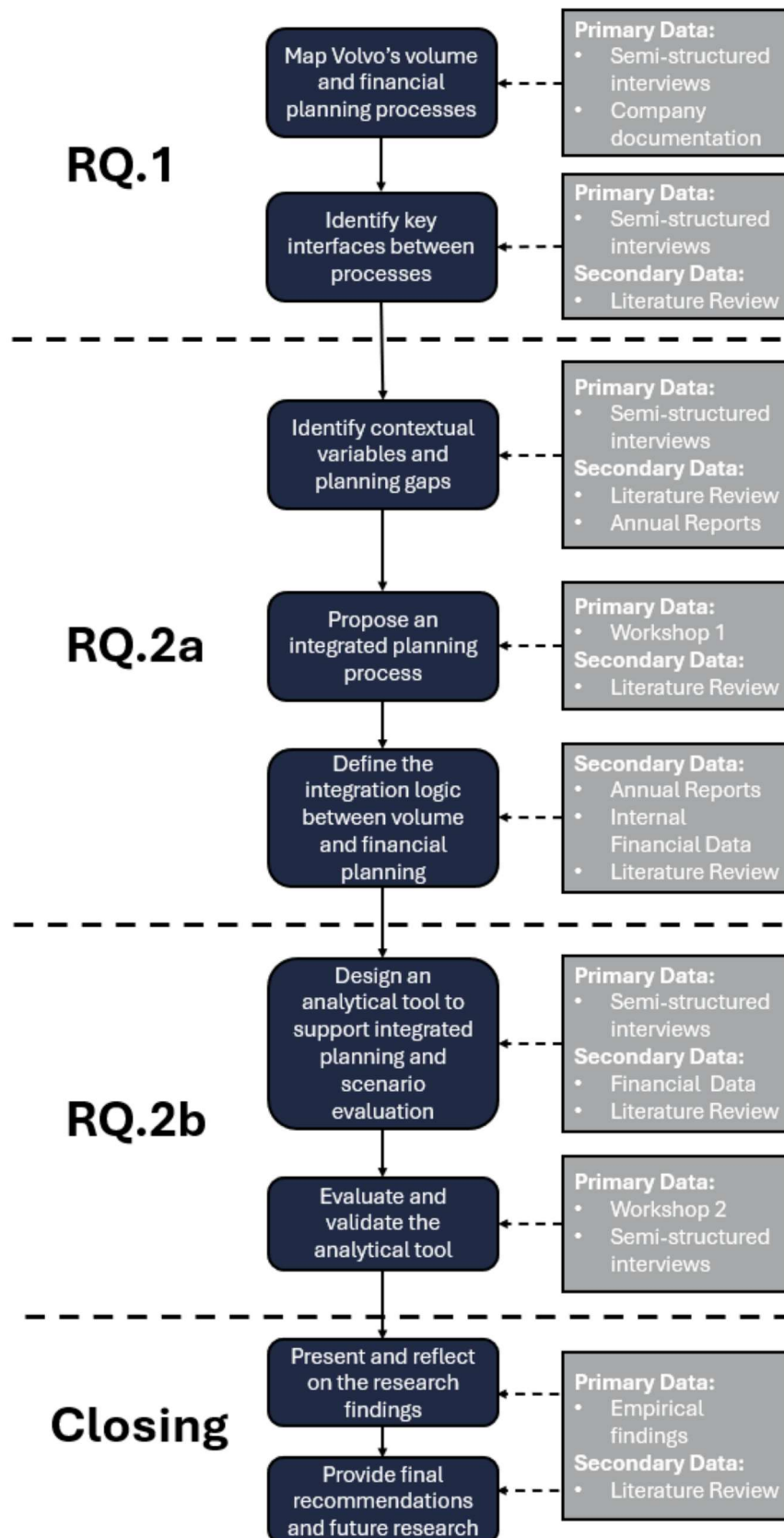


Figure 3.1: Research Process

3.3.1 Research Question 1

A qualitative analysis of Volvo's current volume planning and financial planning processes was conducted to identify the key interfaces between the processes.

First, data gathered through semi-structured interviews and company documentation was used to map the existing planning processes, focusing on understanding process activities, roles, planning frequencies, and information flows across functions. The analysis focused on identifying:

- Key steps in volume planning and financial planning
- Data inputs and outputs
- Existing interfaces and interactions between functions

Second, the collected empirical data was structured and compared across functions to understand how information is exchanged throughout the planning process and how operational and financial planning activities interact within the current planning environment.

3.3.2 Research Question 2

Answering RQ2 required the analysis of how volume planning and financial planning could be more effectively integrated. This included identifying contextual variables and planning gaps influencing the integration requirements, proposing an integrated planning process, defining the integration logic between operational and financial planning, and developing an analytical tool (further described in Section 3.4 and Section 6) capable of supporting integrated and scenario-based decision-making. The analysis was divided into two sub-questions.

3.3.2.1 Research Question 2a

The analysis for RQ2a focused on understanding the gaps between the current planning processes and the requirements of the planning context, as well as how these findings influence the integration between volume planning and financial planning.

First, the findings from RQ1 were analyzed together with semi-structured interviews, company data, and literature to identify contextual variables and planning gaps affecting the interaction between volume planning and financial planning. The analysis focused on understanding how characteristics such as planning complexity, organizational interfaces, planning frequencies, data structures, and operational constraints influence the requirements of the integration design.

Second, the collected empirical data was compared with the literature on S&OP and IBP to identify gaps and misalignments between the current planning processes and the requirements suggested in the literature. This comparative approach is consistent with case study research, where empirical findings are interpreted in relation to existing theory (Gustafsson, 2017).

Based on the findings, an integrated business planning process including financial input was proposed. The process proposal aimed to define how financial considerations could be incorporated into the volume planning process through a structured interface between operational and financial planning.

The proposed process was then presented and validated in Workshop 1, where stakeholders reviewed both the current-state analysis and the proposed integrated planning process. Feedback from participants was used to refine the process design and ensure alignment with the organizational context.

With the proposed process defined, the analysis continued with the definition of the integration logic between volume planning and financial planning. Semi-structured interviews and internal financial data were used to identify the key variables influencing the integration logic, including variables related to cost of sales, freight, demand, and financial estimates. This empirical data was cross-referenced with Annual Reports and literature to define the required level of granularity, planning horizon, and assumptions needed to connect volume planning with financial outcomes.

This step combined qualitative insights with quantitative data to ensure that the translation logic reflects the real business context and supports decision-making. The approach follows the principle that data collection should be aligned with how the data will be used in the analysis (INTRAC, 2017).

3.3.2.2 Research Question 2b

The analysis for RQ2b focused on designing and validating an analytical tool capable of supporting the integration between volume planning and financial planning through scenario-based decision-making. First, a proof-of-concept was developed based on stakeholder input, internal financial data, and identified business constraints. This step aimed to establish a realistic planning environment in which the analytical tool and integration logic could be applied and evaluated.

Second, the analytical tool was designed to integrate volume planning and financial planning data in order to translate operational volumes into economic value and evaluate allocation alternatives under different planning conditions. The model allows users to adjust operational and financial parameters and simulate alternative scenarios to assess their impact on financial performance and allocation decisions.

Third, the results, assumptions, model logic, constraints, and simulation outputs were evaluated and validated through Workshop 2, where stakeholders reviewed the applicability and usefulness of the model for decision-making.

Finally, the scenario results and optimization outputs were further assessed through sensitivity analyses and discussions with key stakeholders involved in the current planning and financial estimation processes.

3.4 Data Architecture & Preprocessing

This section details how the study’s heterogeneous data sources were integrated, cleaned, and transformed into a coherent dataset suitable for the proof of concept.

3.4.1 Data Integration and Relational Mapping

The purpose of the data integration stage was to ensure that the underlying tables could “speak to each other”, meaning that information originating from different sources could be combined without ambiguity, duplication, or loss of meaning.

A relational data model was developed to define how entities and attributes relate across the dataset. Central to this model was the creation and use of unique identifiers (keys) that enabled consistent linking between qualitative process mapping steps and quantitative planning variables. These identifiers served as a controlled mechanism for integration; keys provided a stable join logic and made the relationships between entities explicit. This approach aligns with the broader view that decision-support tools depend on robust, well-structured data foundations to avoid downstream issues in reporting, interpretation, and model behavior (Kimball, 2013).

3.4.2 Data Cleaning

Once relationships between datasets were defined, data quality issues were addressed to improve completeness and usability for modelling. During inspection, gaps and data voids were identified, particularly in profit and cost variables.

Two complementary strategies were applied. First, for minor gaps in profit and cost data, mean imputation was used. The logic was pragmatic and methodological: when some data point was missing, the variable mean was considered to preserve the number of usable observations and ensured that the dataset remained analyzable without injecting subjective estimates (Kimball, 2013).

Second, where data was entirely absent and no reasonable statistical imputation could be justified, expert elicitation was used to define realistic parameter values. In practical terms, stakeholder interviews were conducted to capture informed judgments about plausible ranges and operationally credible assumptions for the Planning Tool. This method was not treated as a substitute for data, but as a transparent bridge between qualitative process knowledge and quantitative parameterization when historical records did not exist. In this study, it additionally served to align the tool's parameters with the lived process reality described in the qualitative mapping, thereby strengthening coherence between the qualitative and quantitative components (Kimball, 2013; Meyer and Booker, 1991).

3.4.3 Data Transformation and Tool Preparation

The transformation process consolidated three primary inputs: expected volumes, expected cost, and expected profit. Each source contained its own dimensional structure, with some dimensions shared (for example, overlapping categories or time references) and others unique to a specific dataset. Each dataset was first cleaned independently to ensure internal consistency. Next, the sources were transformed to a common granularity so they could be compared and combined meaningfully within the Planning Tool. Then, the unique keys were used to match tables. The output of this work was a set of purpose-built tables designed for direct loading into the model, reflecting the dimensional and relational structure required for consistent tool operation (Kimball, 2013).

3.5 Validity and Reliability

To ensure methodological rigor, this study applies quality criteria suited to its mixed approach, combining qualitative process mapping with a quantitative optimization

model. In business research, validity concerns whether the study is capturing what it claims to capture, whereas reliability concerns the consistency and stability of the research processes and outputs if they were repeated or challenged under comparable conditions (Bell et al., 2022). The measures described below are therefore designed to support both (1) credible representation of operational reality in the mapped processes and (2) dependable performance and interpretation of the Planning Tool.

3.5.1 Validity

To ensure that the process maps accurately reflect the current operational reality, this study applies face validity through structured reviews with practitioners. Face validity is used here as a practical check of whether the representation “looks right” to knowledgeable stakeholders and whether the modelled workflow aligns with the logic of day-to-day operations. This was applied in an iterative way during the process mapping, presenting our representations of process workflows to key stakeholders, the workshop was also a form of face validity utilized for this research. This is relevant in applied business research where constructs and representations must remain anchored in organizational practice rather than only in abstract modelling choices (Bell et al., 2022). Establishing this grounded starting point reduces the risk that subsequent analysis is built on an inaccurate depiction of process steps, handovers, constraints, or decision points.

Beyond face validity, validity is strengthened through triangulation, combining multiple sources and types of evidence to examine whether they converge on the same operational picture (INTRAC, 2017). In this study, triangulation is achieved by cross-checking qualitative inputs (for example, stakeholder explanations of process logic and constraints) with different stakeholders about one same process, ensuring that logic and flow is common from different perspectives. This triangulation was performed during the whole process mapping, having different roles explaining to us the process, inputs and outputs. This approach supports the broader principle in business research that stronger inferences can be made when findings are corroborated through more than one lens, rather than being dependent on a single dataset (Bell et al., 2022). Importantly, triangulation here also functions as an internal consistency check between the “story” captured in the mapping and the “numbers” embedded in the planning tool, thereby improving construct alignment across the mixed-method design.

3.5.2 Reliability

Reliability in the qualitative component is supported through member checking, where interim versions of the process maps and improvement proposals are shared back with the participants who contributed the original knowledge (Creswell and Miller, 2000). The purpose is twofold: (1) to verify that the researcher’s interpretation matches participants’ intended meaning and (2) to identify misunderstandings or omissions early enough to correct them. This practice strengthens the dependability of qualitative outputs by making the interpretation process more transparent and less reliant on a single researcher’s assumptions (Bell et al., 2022). In this study, member checking is implemented as an iterative feedback loop, where stakeholder

confirmations and corrections are incorporated into the evolving process representation. The workshops are the main form of member checking in this research, but informal meetings also provide critical corrections and feedback.

For the quantitative optimization model, reliability is addressed by conducting sensitivity analysis as a structured “stress test” of the model’s outputs. Sensitivity analysis examines how variations in input assumptions or parameter values influence model results, thereby indicating whether conclusions are robust or whether they depend heavily on specific inputs (Saltelli et al., 2007). In the context of this Planning Tool, sensitivity analysis is used to assess whether small changes in operational parameters (for example, modest shifts in expected volumes, costs, or profit estimates) lead to disproportionate changes in recommended plans. This exercise was performed after modeling the tool, by different volume and parameter testing. Demonstrating that results remain stable under plausible variations increases confidence that the model is not overly sensitive to minor data fluctuations and that it behaves consistently under changing operational conditions (Saltelli et al., 2007).

Together, member checking and sensitivity analysis address reliability across both methodological strands: the former supports consistency of qualitative interpretation, while the latter supports stability and robustness of the quantitative model.

3.6 Ethical Aspects

This research is conducted in accordance with established ethical principles in business research, with particular emphasis on informed consent, confidentiality, avoidance of harm, and responsible data management (Bell et al., 2022). Because the study relies on company-provided empirical material and stakeholder input, ethical safeguards are necessary both to protect participants and to protect the organization from unintended disclosure of sensitive operational or strategic information.

3.6.1 Informed consent and avoidance of harm

All stakeholder participation is based on informed consent, meaning participants are provided with clear information about the purpose of the study, what participation involves, and how their input will be used in the analysis and write-up (Bell et al., 2022). Participation is voluntary, and the study is designed to minimize potential harm such as undue workload, discomfort in discussing internal challenges, or negative consequences linked to individual statements. Where potentially sensitive topics arise, the focus is kept on processes and system-level learning rather than individual performance.

3.6.2 Confidentiality and secure handling of company data

All empirical material provided by the company is used solely for academic purposes and handled with care to prevent unauthorized access, misuse, or accidental disclosure. Sensitive business information is treated as confidential and, where appropriate, is aggregated or anonymized in the thesis to reduce the likelihood that individuals, teams, operational units, or strategic decisions can be identified (Bell et al., 2022). Access to raw files is restricted, and only the minimum necessary data

is retained for analysis, consistent with responsible data management practices.

In line with the European Code of Conduct for Research Integrity, the study is transparent about how data are accessed and used, and aims to ensure appropriate stewardship, curation, and preservation of research materials for a clearly defined period (ALLEA, 2023). Where restrictions apply, confidentiality is respected when legitimately required, particularly for commercially sensitive findings.

3.6.3 Research integrity, transparency, and objectivity

The study follows the principles of the European Code of Conduct for Research Integrity to support integrity across the full research process, including careful and transparent design, analysis, and documentation of methods (ALLEA, 2023). This includes a commitment to honest reporting of results and uncertainties, and to avoiding misrepresentation or selective presentation of findings. The analysis is conducted with the intention of maintaining objectivity and independence, ensuring that conclusions are grounded in evidence rather than organizational preferences.

Furthermore, the study adheres to core standards of good scholarly practice, including proper citation and avoiding plagiarism (Bell et al., 2022). Any limitations related to data availability, assumptions, or modelling choices are described transparently to allow readers to evaluate the strength and applicability of the conclusions (ALLEA, 2023).

4

Current State Mapping

This chapter presents the current state of Volvo’s planning processes based on primary data. It outlines the volume planning and S&OP process, followed by the financial planning process. These elements establish the basis for the analysis in the following chapter.

4.1 Volume Planning Process

Volvo’s volume planning is performed across multiple planning horizons to support decisions at different levels of the organization. The planning structure combines long-term strategic decisions with shorter-term tactical and operational planning.

Strategic long-term planning covers a horizon of approximately 1–10 years and is used to support decisions related to future market development, product strategy, and long-term capacity needs. Mid-term capacity planning covers approximately 1–3 years and is used to secure capacity decisions for production and supply.

Tactical planning is managed through the S&OP process, which operates on a rolling horizon of 13–24 months. The purpose of this process is to align market demand with available production and supply capacity at an aggregated level. Finally, short-term operational planning is managed through S&OE, which covers a horizon of approximately 0–12 weeks and focuses on actual orders, production status, restrictions, and deliveries. The objective of S&OE is to ensure that execution remains aligned with the decisions taken during the S&OP process.

Among these planning horizons, the tactical S&OP process is the primary focus of this study, as it represents the main interface between volume and financial planning.

4.1.1 Current S&OP Process

Volvo’s current S&OP process is a monthly planning process used to align market demand with available operational capacity. The process aims to create a consensus volume plan that balances expected demand, plant capabilities, and supplier capacity over a rolling planning horizon of up to 24 months.

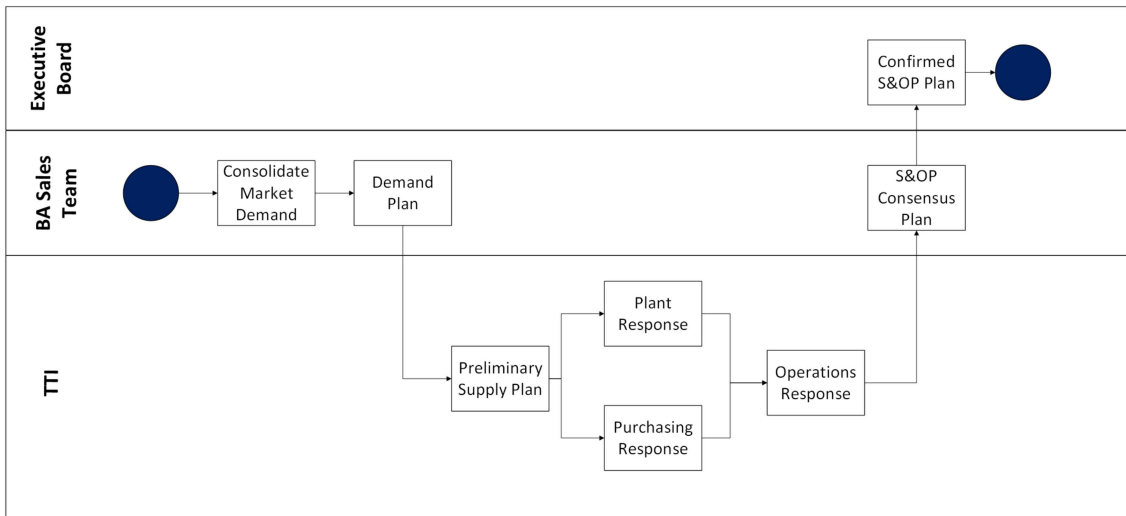


Figure 4.1: Current monthly S&OP process at Volvo

Figure 4.1 illustrates Volvo’s current monthly S&OP process and the main interactions between Sales, TTI, and Executive Management. The process begins with the consolidation of market forecasts into a demand plan, which reflects the expected sales volumes from the different market organizations. Based on this information, a preliminary supply plan is created and communicated to production plants and purchasing functions for evaluation.

The production plants provide a plant response based on available capacity, production constraints, and operational considerations, while purchasing assesses whether suppliers can support the proposed volumes. These responses are then consolidated into an operations response, which represents the operationally feasible supply plan and highlights any constraints, risks, or required adjustments. The operations response serves as the basis for the S&OP consensus plan. This consensus plan represents the agreed volume plan between sales, operations, purchasing, and other relevant functions. Once approved by executive management, the plan is released to markets, plants, and suppliers to guide subsequent planning and execution activities.

The current process is primarily volume-driven and is organized around a monthly cycle. The main stakeholders involved include sales market representatives, S&OP planners, production plants, purchasing, and operational management. The process focuses on achieving agreement on customer demand, production volumes, and supply feasibility. In the shorter S&OE horizon, the planning becomes more operational and is updated weekly based on actual orders, production status, restrictions, and deliveries. The objective at this stage is to ensure that execution remains aligned with the decisions taken during the S&OP process.

Although the process creates alignment between demand and supply, financial information is not formally embedded within the monthly S&OP cycle. Cost, margin, and profitability considerations are typically assessed afterwards within the financial planning process. As a result, the current process supports volume alignment but provides limited visibility of the financial consequences of different planning alternatives.

4.2 Financial Planning Process

At Volvo Trucks, financial volume planning can be described as a medium-term planning process primarily intended to support business performance steering and yearly target setting. The process covers the global organization and is characterized by a bottom-up logic in which decentralized and centralized roles interact iteratively. In this setup, the financial plan is not identical to the operational volume plan but is instead built on the outcome of the volume planning process. Whereas the volume plan is expressed in produced units and structured around operational dimensions such as sales areas, product families, technologies and plants, the financial plan translates this outlook into economic values structured by markets, sales areas and brands. This indicates that the two planning domains address different managerial purposes and therefore operate with different but related granularities.

In temporal terms, the financial planning process follows a relatively low update frequency compared with the monthly cadence associated with the S&OP volume planning. The main financial plan is updated three times per year, with the final cycle of the year being the most significant for target setting. At the same time, some related sub-processes are conducted monthly or annually, both in decentralized and centralized parts of the organization. The planning horizon is rolling in nature, covering the remainder of the current year and one additional full year, which means that the horizon typically spans between 13 and 24 months, this length is shared with S&OP horizon.

The relation between financial planning and volume planning is sequential rather than fully integrated. The financial planning process currently starts after the S&OP-driven volume plan has been established and uses it as a key input together with pricing, cost and exchange-rate assumptions. Its output includes revenue and margin outlooks, target updates and management decision material used for internal alignment, investment-related decisions and performance follow-up. However, the link to volume planning weakens after the initial translation stage. The interaction is initially direct and formal, but thereafter limited, with updates typically triggered only by exceptional events rather than continuous replanning. As a result, a temporal disconnect may arise between the volume assumptions used for different financial estimations. From a process perspective, this suggests an indirect and only partly synchronized relationship between volume planning and financial planning, rather than an integrated one-number planning environment. Business control owns the financial planning process, while sales and operations contribute to it, and deviations are expected to be resolved at analyst level before results are escalated across organizational levels.

In summary, while volume and financial planning are interrelated domains, they exhibit distinct operational characteristics. The primary similarity between the two lies in their temporal scope, as both processes operate over a shared rolling horizon of 13 to 24 months. Additionally, both approaches require a global scope, consolidating inputs from across the organization. However, they differ significantly in their core purpose, cadence, and granularity. Volume planning aims to align physical supply and demand through a dynamic, monthly cycle, measuring output in produced units

and structuring data around operational dimensions like plants and technologies. Conversely, financial planning is geared towards business performance steering and yearly target setting. It operates on a lower frequency, updating its main plan three times a year, and focuses on translating physical volumes into economic values structured by commercial dimensions such as brands and markets.

4.3 Macro Process View

In order to zoom out and get a more holistic view of both processes and their interfaces, Figure 4.2 provides an overview of the interaction between the volume planning and financial planning processes, illustrating the main data flows and planning frequencies across functions.

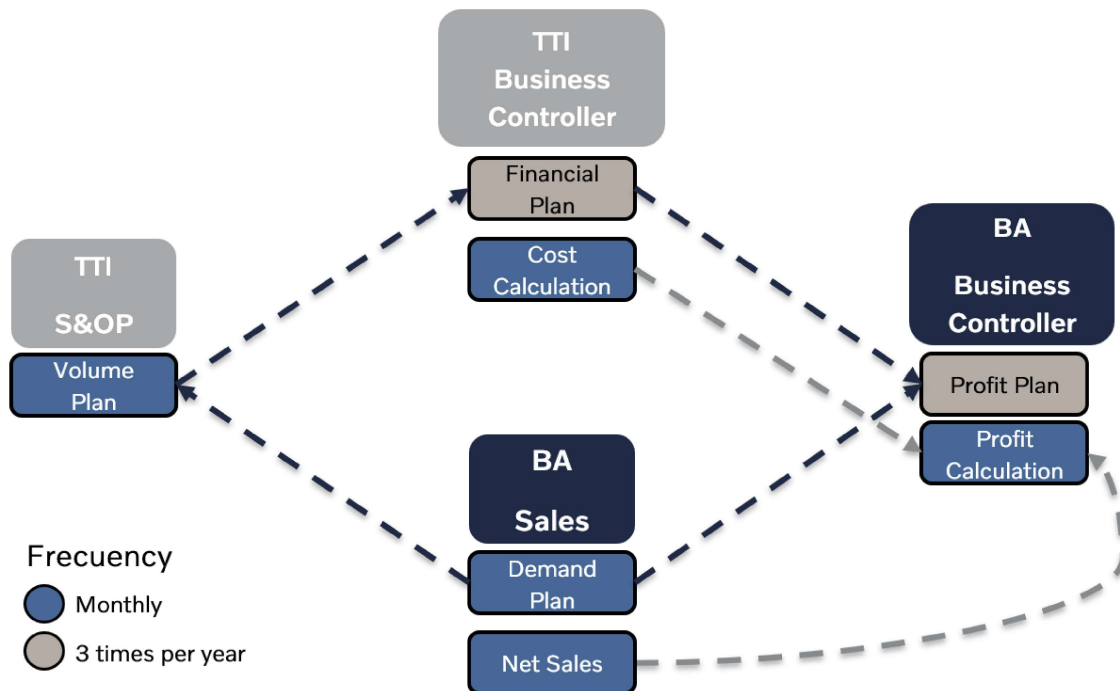


Figure 4.2: Macro Process Map

The figure illustrates the main interfaces between volume planning and financial planning across the current planning cycle. In particular, it shows that the connection between the two processes is established primarily when the Financial Plan is derived from the Volume Plan and then later re-checked against an updated demand plan for profit estimations which are performed on separate departments on the Business Area side. The figure therefore suggests that the current relationship between volume and financial planning is sequential rather than fully integrated. Although several additional processes and sub-processes are involved, the figure captures the most relevant interfaces for this study and indicates that business planning is still organized through partially disconnected functional processes with separate ownership of different planning responsibilities.

5

Analysis

This chapter analyzes the current interaction between Volvo’s volume planning and financial planning processes. Building on empirical findings, it examines the interfaces between the processes and identifies key contextual variables to reflect the current situation and analyze its fit with the current context.

5.1 Planning Processes’ Interfaces

The analysis of the current planning processes indicates that the interaction between volume planning and financial planning follows a predominantly sequential structure rather than a fully integrated one.

As illustrated in Figure 4.2, market demand is translated into a monthly S&OP program, which represents the main output of the volume planning process. However, only selected versions of this program are used as input for the financial planning process, which is updated at a lower frequency (three times per year). As a result, financial estimates are based on a specific version of the volume plan, while the S&OP process continues to evolve on a monthly basis.

This difference in planning cadence creates a temporal misalignment between operational and financial planning. When financial estimates are finalized, a new S&OP program is already in development, while the financial plan remains unchanged until the next update cycle. Consequently, financial planning may not fully reflect the most recent operational assumptions at all points in time.

In addition to temporal differences, the analysis also indicates a limited level of financial visibility within the S&OP process. Financial information is not shared across all planning functions due to the sensitivity of financial data. As a result, volume planning decisions are made without full visibility of their financial implications. Similarly, when decisions related to capacity or supply allocation are made, the prioritization of alternatives does not explicitly consider their impact on profitability.

From a process perspective, the interaction between functions can be described as iterative but not fully collaborative. Information is transferred between functions in stages, and each function applies its own assumptions and logic. This reflects a structure where functions operate with a degree of independence, and alignment is achieved through sequential handovers rather than continuous cross-functional integration. The analysis also indicates that different functions operate with partially synchronized datasets and planning assumptions. This silo way of working reduces

the ability to evaluate operational and financial trade-offs in a coordinated manner. Taken together, the identified interfaces suggest that the relationship between volume planning and financial planning is formalized but only partially integrated. While the two processes are connected through structured information exchanges, the interaction is constrained by differences in planning cadence, limited financial visibility, and sequential cross-functional coordination. As a result, volume and financial planning remain aligned primarily through periodic handovers rather than through continuous joint evaluation and decision-making. These interfaces therefore represent critical areas, as they indicate where the current planning design may struggle to support timely and coordinated operational-financial decision-making.

5.2 Contextual Variables Influencing Translation Design

The analysis indicates that the design of the translation from volume planning into economic value is strongly influenced by the characteristics of Volvo's planning environment. Several contextual variables were identified as particularly relevant for shaping how operational and financial information can be connected and evaluated within the planning process.

5.2.1 Industry Context

The heavy-duty truck market represents a planning environment characterized by high capital intensity, long asset lifecycles, and substantial irreversibility of major operational decisions. In this environment, strategic and tactical choices such as capacity adjustments, footprint changes, and product and technology transitions require significant lead times and investments, increasing the importance of planning under uncertainty (Abate et al., 2025).

At the same time, the industry is undergoing structural shifts towards more sustainable and technology-intensive solutions, increasing both the number of relevant planning assumptions and the volatility of key drivers (Botão et al., 2023). In addition, increasing competitive pressure from new entrants in more price-sensitive segments contributes to higher uncertainty in demand, product portfolios, and market conditions (McKinsey, 2024).

The industry is also strongly influenced by regulatory developments, particularly in Europe, where sustainability requirements and emissions regulations continue to evolve rapidly. These changes introduce variability in both demand and supply conditions and affect product portfolio priorities, production requirements, and operational planning assumptions (Syré and Göhlich, 2025).

Beyond these structural characteristics, production adjustments introduce an additional layer of complexity. Changes in production volumes, such as ramp-ups or ramp-downs, are not cost-neutral and often involve operational inefficiencies, resource adjustments, and coordination efforts across the supply chain. These effects are particularly relevant in the short term, where capacity flexibility is more limited. Overall, these industry characteristics reinforce the need for planning processes that

can integrate operational and financial perspectives and support the evaluation of trade-offs under uncertainty. In particular, they highlight the importance of mechanisms that can capture both static and dynamic economic effects of planning decisions, providing a more comprehensive basis for decision-making.

5.2.2 Dynamic and Detail Complexity

The industry characteristics described in Section 5.2.1 translate into high levels of both dynamic and detail complexity within the planning environment. Dynamic complexity arises from uncertainty in demand, price, cost structures, and market conditions, while detail complexity is reflected in the large number of planning dimensions, including multiple plants, sales areas, product classes, and technologies.

In this context, three variables were identified as particularly relevant for decision-making: demand, price, and cost of sales. These variables directly influence the economic outcome of planning decisions and therefore become central in connecting operational planning decisions with financial outcomes.

The presence of these complexities increases the need to evaluate trade-offs across multiple planning dimensions. For example, differences in price across sales areas may influence prioritization decisions, while cost structures affect the profitability of supplying specific markets. As a result, planning decisions involve balancing operational feasibility with economic implications across different products, plants, and markets.

Furthermore, the high level of detail complexity creates challenges related to data structure, planning granularity, and computational feasibility. To manage these complexities, the analysis was conducted at an aggregated level consisting of plant, sales area, product class, and monthly planning periods, allowing relevant planning dimensions to be captured while maintaining a manageable level of detail.

5.2.3 Manufacturing Strategy

The manufacturing strategy for the European context is primarily assembly-to-order, meaning that production is driven directly by demand rather than by maintaining finished goods inventory. As a result, inventory does not play a central role in the planning process.

This context increases the importance of capacity allocation and supply decisions, as demand fulfillment becomes highly dependent on production and distribution capabilities. In addition, the absence of inventory buffers increases the sensitivity of planning decisions to changes in demand, production capacity, and supply conditions, reinforcing the need to evaluate trade-offs across different production and distribution alternatives.

5.2.4 Hierarchical Planning Framework

The planning environment at Volvo follows a hierarchical structure, where S&OP operates at a tactical level, while financial planning follows a separate process with a lower update frequency. This separation results in a sequential interaction between volume and financial planning, as identified in Section 5.1.

This planning structure creates challenges in maintaining continuous alignment between tactical operational decisions and financial evaluation throughout the planning horizon. As operational plans evolve more frequently than financial estimates, different planning functions operate with partially synchronized planning assumptions and time horizons.

This context directly influences the need for a translation mechanism that can bridge these planning levels. The volume-to-economic value translation could act as an interface between operational planning outputs and financial evaluation, enabling a more continuous alignment between tactical decisions and financial outcomes.

5.2.5 Organizational Characteristics

The empirical findings indicate that organizational characteristics also play a significant role in shaping the planning process. In particular, financial information is not shared across all functions, partly due to the sensitivity of financial data. As a result, volume planning decisions are often made without full visibility of their financial implications.

In addition, the analysis indicates that operational and financial information are structured differently across functions. Volume planning is organized around operational dimensions such as plants, sales areas, product families, and technologies, while financial planning structures information according to financial reporting requirements and business dimensions. This creates challenges in aligning operational and financial information across the planning process.

This context influences the design of the translation by requiring a simplified and standardized representation of financial data that can be shared across functions without exposing sensitive details. The translation therefore acts as a common interface that enables cross-functional understanding and supports integrated decision-making.

5.3 Gap Analysis: Planning Requirements and Current Process Limitations

From the combined contingency and OIPT perspective adopted in this study, the contextual variables identified in Sections 5.1 and 5.2 can be interpreted as increasing several information processing requirements associated with integrating volume planning and financial planning. More specifically, the dynamic complexity of the planning environment increases the need to maintain synchronized operational and financial assumptions under changing demand, supply and market conditions. Detail complexity increases the need to process large amounts of heterogeneous planning information across products, plants, sales areas, markets and brands. The hierarchical planning framework increases the need to translate information consistently across planning levels and time horizons, while the organizational characteristics of the current setup increase the need for cross-functional coordination and common interpretation of planning outputs. In the present case, these contextual conditions generate at least five specific information processing requirements: the need for

synchronized operational and financial assumptions over time, the need for cross-functional financial visibility during planning, the need to translate heterogeneous planning data into a shared basis, the need to evaluate trade-offs across operational and financial dimensions, and the need to assess alternative scenarios under changing conditions.

To cope with these requirements, the planning process would need corresponding information processing capacities. In this study, the most relevant capacities for finance integration can be described as cross-functional financial visibility, volume-to-value translation capability, shared planning assumptions and data alignment, trade-off evaluation capability across operational and financial dimensions, scenario-based financial evaluation capability and cross-functional governance for integrated planning.

However, the current response variables provide only limited capacity in relation to these demands. While the process includes formal interfaces, recurring meetings and functional handovers, it offers only restricted financial visibility across functions, limited capability to translate volume assumptions into economic implications within the same planning cycle, partially aligned planning assumptions and little support for integrated scenario-based financial evaluation.

In this sense, the current process design can be understood as only partly capable of coping with the information-processing demands created by its planning context. Specifically, this mismatch manifests in three primary gaps. First, Time Misalignment occurs because volume and financial planning operate on different cadences, often leaving financial estimates out of sync with the latest operational updates. Second, Limited Visibility arises from the restricted sharing of sensitive financial data, which prevents decision-makers from fully evaluating the economic implications of volume plans. Finally, a Silo Trap reflects the sequential and independent nature of functional interactions, resulting in fragmented assumptions and a limited ability to coordinate operational and financial trade-offs. Table 5.1 summarizes the three main gaps identified in the current planning set-up.

Table 5.1: Gaps between planning requirements and current process capabilities

Gap	Current process	Related IPR	Missing or limited IPC
Time Misalignment	Volume planning and financial planning are conducted at different points in time, meaning that financial planning may not reflect the latest operational assumptions throughout the cycle.	Need to maintain synchronized operational and financial assumptions over time and to support timely re-evaluation under changing conditions.	Limited capability to align planning assumptions continuously, dynamic synchronization between planning cycles, and limited scenario-based financial reassessment.
Limited Visibility	Financial information is not broadly shared across planning functions due to data sensitivity, reducing visibility of financial implications during volume-planning decisions.	Need for cross-functional financial visibility and for translating operational plans into financially meaningful information during planning.	Restricted financial visibility across functions and weak volume-to-value translation capability within the planning process.
Silo Trap	Functions interact mainly through sequential handovers, applying their own assumptions and logic, while datasets and planning assumptions remain only partly synchronized.	Need to translate heterogeneous planning data on a shared basis and evaluate operational-financial trade-offs in a coordinated way.	Weak shared planning basis, limited data alignment, insufficient cross-functional trade-off evaluation capability, and fragmented governance for integrated planning.

Taken together, these three gaps indicate that the current planning design does not fully match the requirements created by the planning context. In contingency terms, the process remains only partly adapted to the dynamic and detail complexity of the planning environment and to the broader planning system in which it operates.

In OIPT terms, the current process provides insufficient information processing capacity in key areas required for integrating volume and financial planning, especially regarding synchronized planning assumptions, financial visibility, translation capability and coordinated trade-off evaluation. These limitations affect planning quality not only in informational terms, but also procedurally and in terms of alignment, as the process does not fully support timely information sharing, joint interpretation of alternatives or coordinated cross-functional decision-making.

The analysis therefore suggests that the current relationship between volume planning and financial planning is formalized but not fully integrated. While the existing process provides some interfaces between the two planning domains, these interfaces remain constrained by timing gaps, limited financial visibility and siloed functional execution. As a result, the current setup struggles to support coordinated evaluation of operational and financial trade-offs in a sufficiently timely and transparent manner. From an information-processing perspective, the current response variables do not provide sufficient capacity to cope with the demands created by the planning context. This identified gap provides the basis for Chapter 6, which presents a process proposal and a proof of concept intended to strengthen the integration of finance into volume planning.

6

Integrating Finance into Volume Planning

This chapter presents the process proposal and proof of concept developed to integrate financial planning into volume planning at Volvo. Its aim is to describe the proposed process design and analytical tool developed to bridge the gaps identified in Chapter 5. In line with the theoretical framework, these proposals can be viewed as response variables designed to enhance the organization's information-processing capacity (IPC) and support integrated planning.

6.1 Process Proposal

To address the gaps identified in the empirical findings, a revised planning process was developed to integrate financial considerations into the S&OP cycle. The proposed process introduces a shift from a sequential "waterfall" structure towards a more integrated planning approach aligned with Integrated Business Planning (IBP) principles.

Figure 6.1 illustrates the proposed IBP process, highlighting the integration of volume planning, financial inputs, and scenario-based decision-making within a single planning cycle.

6. Integrating Finance into Volume Planning

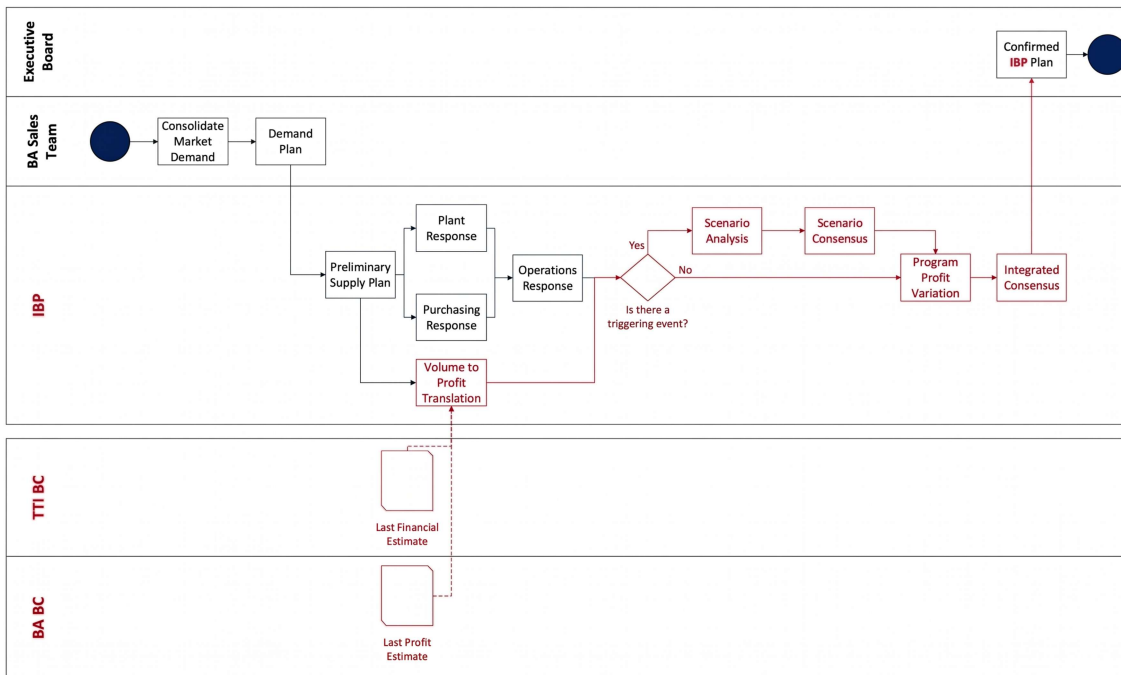


Figure 6.1: IBP Process Proposal

The figure illustrates how the proposed IBP process is built upon the existing S&OP process. The black boxes represent the current S&OP activities that remain as the foundation of the process, while the red boxes indicate the additions and modifications introduced in the proposed design. A key development is the introduction of an IBP process ownership, reflecting an expanded cross-functional scope beyond the traditional volume-driven focus. In the proposed process, the existing S&OP structure is retained but extended to include finance, sales, portfolio management and strategic decision-makers. The figure also shows that the planning process is broadened to incorporate financial and profit estimate inputs alongside volume-planning data, thereby enabling a more integrated business-planning logic.

A key change is the introduction of a monthly volume-to-economic value translation, allowing financial implications to be evaluated within the same planning cadence as volume decisions. This would reduce the temporal gap between operational and financial planning and enable more timely evaluation of trade-offs.

In addition, the process incorporates structured scenario analysis, allowing alternative planning options to be evaluated based on both operational feasibility and financial impact. The integration of financial inputs and scenario evaluation leads to an "integrated consensus," where decisions are made based on both volume and economic value. This contrasts with the current process, where financial evaluation occurs after the volume plan has been defined.

Overall, the proposed process enables a transition from reactive performance evaluation towards proactive decision-making by embedding financial visibility within the planning cycle and supporting the evaluation of trade-offs under different scenarios. This represents a fundamental shift in the scope of financial integration. Rather than acting merely as downstream information providers or late-stage val-

icators of operational plans, financial stakeholders are elevated to critical, active members of the cross-functional IBP team. By accompanying the planning cycle from its very beginning, finance ensures that economic considerations continuously shape the strategy, ultimately driving a truly integrated consensus.

6.2 Proof of Concept

This proof of concept is based on an IBP process proposal in which volume planning data and financial planning data are integrated and standardized. Its purpose is to propose an improved volume allocation plan, based on the Preliminary Supply Plan and Financial Outcomes' translation.

To properly contextualize this proof of concept, its analytical boundaries must be acknowledged. The model simplifies complex corporate financial logic by isolating specific operational cost drivers, namely production, logistics, and flexibility. Consequently, its output evaluates tactical gross margin trade-offs rather than full, accounting-grade profitability. Furthermore, the simulation assumes structural parameter stability during execution and intentionally subtracts unpredictable organizational decision-making behaviors. Ultimately, this model functions as a targeted decision-support mechanism for comparing alternative volume scenarios, rather than a comprehensive representation of enterprise financials. The full model workflow is represented in Figure 6.2.

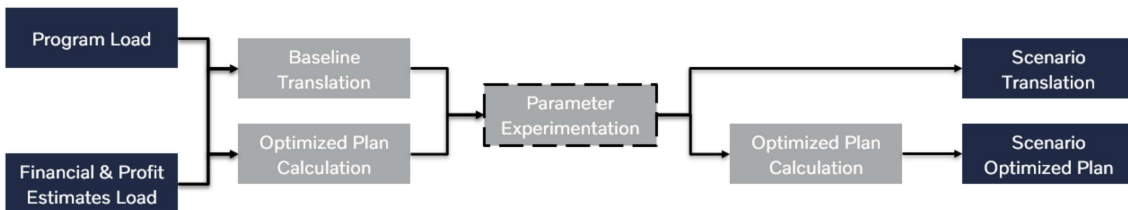


Figure 6.2: Proof of Concept model workflow

The analytical model was implemented in Python and performs both the volume-to-economic-value translation and the optimization calculations. The user interface was developed in Streamlit and serves as the visualization and decision-support layer. The workflow starts with the loading of volume-planning and financial-planning data. Based on these inputs, the tool automatically produces both the baseline volume-to-economic-value translation and an optimized plan suggestion. Starting from this baseline, users can subsequently adjust selected parameters to simulate alternative future scenarios. For each revised scenario, the model recalculates the financial translation and re-executes the optimization routine. This allows users to compare different scenarios, analyze the resulting trade-offs and support more informed decision-making.

Even though the baseline translation and the optimized plan calculation are done simultaneously, it is important to notice that this is only possible because the model has already digested in its logic how the volume-to-economic value translation should be done. Therefore, this translation is the first and most important layer in the analytical model.

In the following sub-sections, the analytical and mathematical details of each of these analytical layers are presented. Due to confidentiality arrangements only general and superficial details will be shown, focusing on the process' logic.

6.2.1 Volume to Economic Value Translation

The first step of the proof of concept consists of translating operational volume-planning outputs into economic values. To do so, the Preliminary Supply Plan and the latest available Financial Estimate are first gathered and aligned. Since both inputs represent planning data, the purpose is not to reconcile actual operational and financial results, but to connect two forward-looking views of the business: volume expectations and financial expectations for the same planning horizon. After that, the required data preparation and transformation are performed. This process varies depending on the level at which operational and financial data are connected. In the present proof of concept, the analysis was limited to European markets supplied by European plants to establish a manageable and coherent case scope.

The objective of this layer is to create a common analytical basis that allows operational volume data and financial information to be interpreted together. More specifically, financial values and ratios are transformed into a unit-based representation, making them comparable with volume data and suitable for subsequent analytical processing.

This enables the model to estimate profit as a function of unit revenue, unit cost and planned volume. In its most basic form, this relationship can be expressed as:

$$Profit = (Unit\ Revenue - Unit\ Cost) \times Volume$$

During the development of this translation logic, important input was obtained from the industrial finance side of the company and later confirmed by the S&OP team. This input concerned the need to account for the cost of short-term changes to volume plans. As a result, a flexibility cost was incorporated into the calculation to reflect the economic consequences of adjusting volumes in the short term. The profit expression was therefore extended as follows:

$$Profit = (Unit\ Revenue - Unit\ Cost - Unit\ Flexibility\ Cost) \times Volume$$

Although this translation may appear straightforward once formalized, the main challenge in this phase was not the arithmetic formulation itself, but the modelling work required to make the different data sources compatible. Operational and financial inputs differed in structure, granularity and underlying logic, which made it necessary to determine how they could be consistently combined. In that sense, the volume-to-economic value translation was not only a calculation step, but also a process of analytical alignment between two planning domains that were not originally designed to interact directly. This translation required a detailed understanding of both the planning process and the available data structure. More details about the required data pre-processing and data architecture were provided in Section 3.4.

A unit-based logic was necessary because the operational plan is expressed in physical volumes, whereas the financial estimate is structured in monetary terms. This translation step serves as the foundation for all the capabilities included in the tool, since it converts operational plan outputs into economic terms that can be evaluated and compared across alternatives.

6.2.2 Volume Allocation Optimization

Based on the translated economic values, the second analytical layer evaluates a large number of feasible allocation alternatives to identify the plan with the highest expected total profit. To support this task, the proof of concept applies a multi-period linear programming optimization, which was selected because it is well suited to planning settings where decisions extend across several time periods and must satisfy different parameters and constraints over time.

The objective of the model is to maximize profit, but this is done subject to the operational and business constraints that define the feasible solution space. In other words, the model does not seek a theoretical maximum under unrestricted conditions, but the most profitable allocation that remains consistent with the planning realities of the business. In the present case, this is achieved by determining the most efficient allocation between assembly plants and sales areas across the planning horizon.

A general mathematical representation of the optimization model used in this proof of concept is presented below.

Indices and sets:

- $i \in I$: Set of Plants
- $j \in J$: Set of Sales Areas
- $t \in T$: Set of Product Class
- $m \in M$: Set of Month

Parameters:

- $Revenue_{j,t,m}$: Revenue per sales area, for technology j , for month m
- $Cost_{i,j,t,m}^{Total}$: Total Production Cost in plant i , for sales area j , for product class t , for month m
- $Flexibility_{i,t,m}$: Flexibility Cost in plant i , for sales area j , for product class t , for month m
- $D_{i,j,t,m}$: Allocation plan for current demand in plant i , for sales area j , for product class t , for month m
- $LastProgram_{i,j,t,m}$: Last Allocation plan in plant i , for sales area j , for product class t , for month m
- $MCap_{i,t,m}$: Maximum Capacity in plant i , for sales area j , for product class t , for month m

Decision Variable:

- $X_{i,j,t,m}$: Volume allocated in plant i , delivered to sales area j , for product class

t , for month m

Other Variables:

- $O_{i,t,m}$: Over-production at plant i , for product class t , for month m
- $U_{i,t,m}$: Under-production at plant i , for product class t , for month m

Objective Function:

Where:

$$\max Z$$

$$Z = (\text{Unit Revenue} - \text{Unit Cost} - \text{Unit Flexibility Cost}) \times \text{Volume}$$

$$\max Z = \sum_{i,j,t,m} \left((\text{Revenue}_{j,t,m} - \text{Cost}_{i,j,t,m}^{\text{Total}}) \times X_{i,j,t,m} \right) - \sum_{i,t,m \leq 6} (\text{Flexibility}_{i,t,m} \times (O_{i,t,m} + U_{i,t,m}))$$

Constraints:

Volume produced cannot be negative:

$$X_{i,j,t,m} \geq 0 \quad \forall i, j, t, m$$

Auxiliary variables capturing over production and under production are restricted to be non-negative:

$$O_{i,t,m} \geq 0$$

$$U_{i,t,m} \geq 0$$

For each sales area, product class, and month, the total volume delivered from all plants cannot exceed the market demand and demand must be always fulfilled:

$$\sum_i X_{i,j,t,m} = \sum_i D_{i,j,t,m} \quad \forall j, t, m$$

Plant capacity limit is parameterized (across all sales areas) for the corresponding product class and month:

$$\sum_j X_{i,j,t,m} \leq \text{M}Cap_{i,t,m} \quad \forall i, t, m$$

For each plant, sales area, product class, and month, the production plan is balanced against the last program volume, with deviations captured as over production and under production:

$$\sum_j X_{i,j,t,m} - O_{i,t,m} + U_{i,t,m} = \sum_j \text{LastProgram}_{i,j,t,m} \quad \forall i, t, m$$

6.2.3 Decision Support and Scenario Planning

To facilitate the practical use of the proof of concept, the optimization model was embedded within a Streamlit-based visualization and decision-support interface developed as part of this study. While the optimization model performs the underlying volume-to-economic-value translation and optimization, the interface enables users

to interact with the model, modify planning assumptions, and visualize the resulting operational and financial impacts. The interface was organized around three main functionalities: an overview and financial visualization view, a scenario simulation environment, and a scenario comparison view, providing users with a common environment for evaluating operational and financial trade-offs.

The tool enables users to adjust selected input parameters and construct alternative planning scenarios. Changes made through the interface are translated into revised model inputs, which trigger a new optimization cycle. Consequently, the tool does not merely display the financial implications of a hypothetical scenario but also generates a revised allocation proposal adapted to the new planning conditions. In this sense, the proof of concept supports a proactive scenario-planning approach, in which alternative assumptions can be evaluated not only in terms of their economic consequences, but also in terms of their implications for the recommended plan.

The adjustable parameters included in the proof of concept are:

- Volume
- Revenue per truck
- Production Cost per truck
- Inbound Freight Cost per truck
- Outbound Freight Cost per truck
- Flexibility Cost per truck

To further support decision-making, the interface includes dashboards and comparison views that allow multiple scenarios to be stored and evaluated side by side. Users can therefore compare how changes in selected operational and financial parameters influence both the value translation process and the resulting optimized outcomes. The interface is intended to support adaptive and forward-looking decision-making by enabling planners to explore alternative futures and assess their implications before decisions are implemented. Additional screenshots and descriptions of the tool functionalities are provided in Appendix A.3 - IBP Tool.

6.2.4 Outcomes

The proof of concept was validated through a workshop and several individual meetings with key stakeholders from the S&OP and finance teams. In addition to this qualitative validation of the model logic, quantitative assessments were also conducted for each analytical layer.

The volume-to-economic-value translation was validated by comparing the model output with the corresponding financial estimate for the same planning period. In other words, the translated financial result generated by the model was assessed against the financial estimate used in the existing planning process. The translation achieved an accuracy level of 95%, which can be considered a strong result given the scope delimitations and simplifications of the proof of concept.

The optimization layer was evaluated through its effect on the resulting profit level in the analyzed case. For the specific proof-of-concept instance, the optimized allocation generated a profit improvement of 1.41% compared to the baseline allocation.

Although this result is limited to a single case and should therefore not be generalized, it indicates that the model has potential to improve planning outcomes by supporting more economically efficient allocation decisions.

The scenario planning layer required a different quantitative validation approach, as no direct historical benchmark was available for comparison. Instead, sensitivity tests were conducted to assess whether the model responded coherently to changes in different parameters. These tests were performed together with key stakeholders who are normally responsible for the corresponding business estimations. Their participation made it possible to evaluate whether the model's reactions to changing assumptions were analytically reasonable and consistent with business expectations. Taken together, the results indicate that the proof of concept performs credibly across its three analytical layers. While the empirical validation is limited by the scope of the case and the nature of the proof-of-concept design, the findings suggest that the model has potential both as a translation mechanism and as a decision-support tool for a more integrated S&OP process.

6.3 Strengthening Planning Fit Through Process and Analytical Design

The process proposal and proof of concept presented in this chapter can be understood as a direct response to the planning gap identified in Section 5.3. From a contingency perspective, they represent a redesign of response variables intended to better fit the contextual demands of the planning environment, specifically targeting the Time Misalignment, Limited Visibility, and Silo Trap limitations that currently constrain the organization.

At the process level, the proposal strengthens the organizational capacities needed to overcome the Silo Trap. More specifically, it provides Cross-functional governance & Shared assumptions through a clearer ownership structure and a more integrated consensus logic. Additionally, it establishes Cross-functional financial visibility by bringing financial perspectives earlier into the planning cycle, which directly bridges the organizational and procedural aspects of the Limited Visibility gap. By reducing the dependence on sequential handovers and late financial translation, the process proposal improves the organizational conditions for more integrated planning.

At the analytical level, the proof of concept complements the process proposal by strengthening technical and data-related capacities to resolve the remaining gaps. The translation layer provides Volume-to-value translation capability & Data Alignment, creating a common analytical basis that fully bridges the technical side of the Limited Visibility gap. Furthermore, the optimization layer delivers Trade-off evaluation capability by enabling coordinated assessment of operational and financial alternatives across the planning horizon. Finally, the scenario layer establishes a Scenario-based financial evaluation capability, which directly tackles the Time Misalignment gap by allowing revised assumptions to be tested and translated into updated financial and allocation outcomes instantly. Together, these layers improve the organization's ability to process heterogeneous operational and financial information in a more timely and coordinated manner.

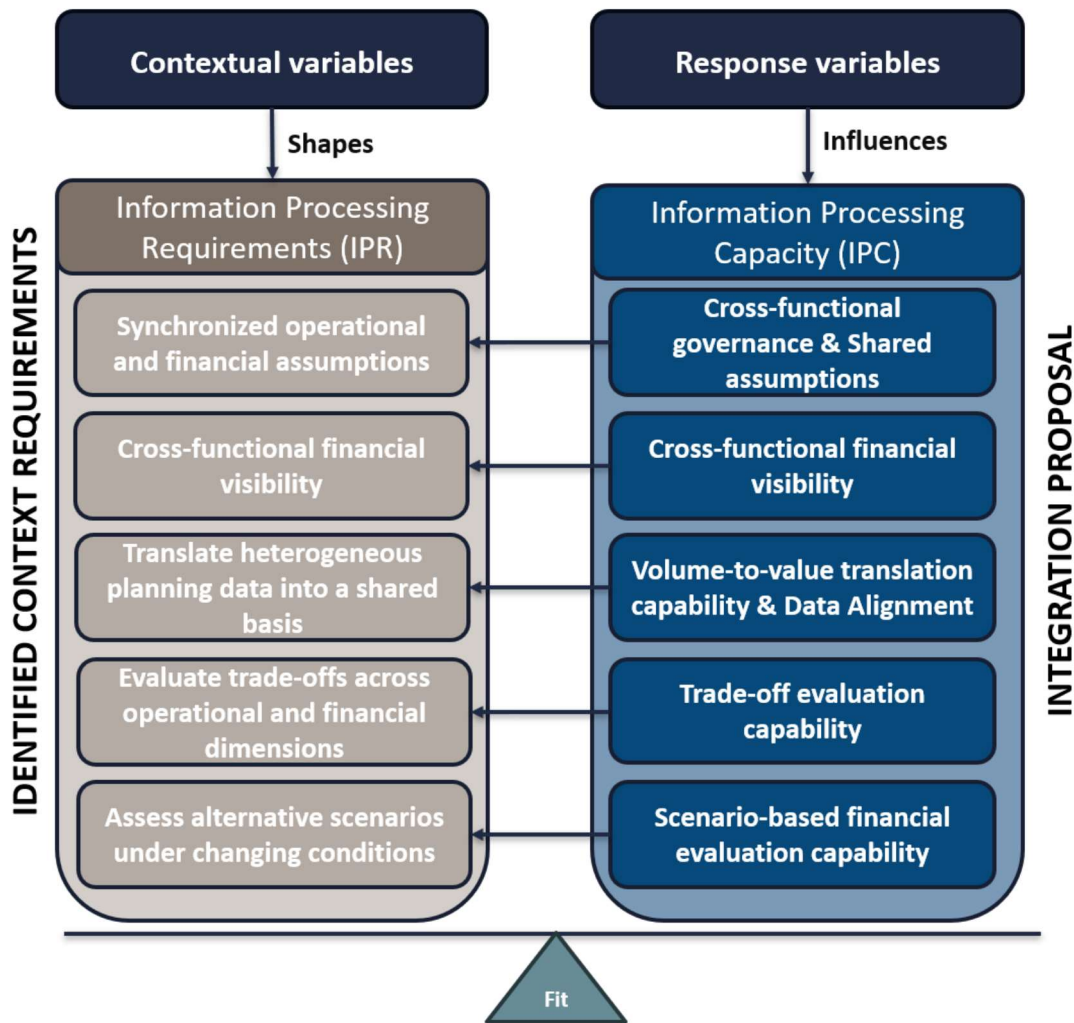


Figure 6.3: Expected fit post-implementation

Figure 6.3 summarizes this improved fit. Although conceptualized in the text across two categories—process-level and analytical-level improvements—the figure presents the consolidated set of new Information Processing Capacities (IPC) delivered by the integration proposal. As illustrated by the direct connections in the diagram, each specific Information Processing Requirement (IPR) generated by the context is now directly addressed by a corresponding IPC. By systematically matching demands with capabilities, the proposed design neutralizes the identified gaps and achieves structural congruence in the studied case.

7

Discussion

The purpose of this chapter is to critically evaluate the findings presented in Chapter 6 by contrasting the proposed IBP process and the proof of concept with the theoretical framework established in Chapter 2. The discussion aims to validate how the proposed solution addresses the identified gaps through the dual lenses of Contingency Theory and OIPT.

7.1 About the empirical findings

The empirical findings indicate that the interaction between volume planning and financial planning at Volvo remains primarily sequential rather than fully integrated. Although interfaces between the processes exist, these interactions are characterized by differences in planning cadence, limited financial visibility across functions, and sequential information handovers. Together, these characteristics create challenges in maintaining synchronized operational and financial assumptions throughout the planning horizon.

These findings are consistent with the literature describing traditional S&OP processes as primarily volume-oriented coordination mechanisms with limited financial integration (Grimson and Pyke, 2007; Seeling et al., 2022). In such environments, finance typically participates after operational plans have already been defined, focusing on evaluating the financial implications of the volume plan rather than actively shaping planning decisions throughout the process. The findings from Volvo reflect a similar structure, where financial planning operates as a partially connected but separate process with a lower update frequency than the operational planning cycle.

From a contingency perspective, the identified gaps suggest a partial misalignment between the current planning design and the characteristics of the planning environment. The heavy-duty truck industry is characterized by high capital intensity, long planning horizons, technology transitions, competitive pressure, and regulatory uncertainty. As highlighted by Kristensen and Jonsson (2018), increasing dynamic and detail complexity raises the need for more adaptive and integrated planning mechanisms capable of evaluating uncertainty and supporting cross-functional trade-offs. However, the current process structure remains largely sequential, limiting the ability to continuously align operational and financial perspectives under changing planning conditions.

The findings also reinforce the importance of contextual fit in S&OP and IBP de-

sign. Rather than suggesting that one universal planning structure should be applied across all firms, the empirical findings support the contingency-based argument proposed by Sousa and Voss (2008) and Kristensen and Jonsson (2018), which states that planning processes must be adapted to the specific characteristics of the planning environment. In Volvo’s case, the combination of dynamic complexity, detail complexity, global coordination requirements, and assembly-to-order manufacturing characteristics increases the need for synchronized information flows and coordinated evaluation mechanisms across functions.

In addition, the findings highlight the relevance of Organizational Information Processing Theory (OIPT) for understanding the observed planning limitations. Schlegel et al. (2021) argue that as organizations move towards more integrated planning environments such as IBP, the amount and complexity of information that must be processed across functions significantly increases. However, the empirical findings indicate that the current process does not provide sufficient mechanisms to fully support these increased information processing requirements. From an OIPT perspective (Galbraith, 1974), the operational environment within the Volvo Group—characterized by high detail complexity across multiple plants and markets, coupled with an Assembly-to-Order (ATO) manufacturing strategy—creates substantial Information Processing Requirements (IPR). Financial information remains partly restricted across functions, planning assumptions are only partially synchronized, and operational and financial data are structured differently across planning domains. This creates challenges in developing a shared and continuously updated planning perspective across functions.

The findings therefore support the argument presented by Schlegel et al. (2021) and Nicolas et al. (2021), who emphasize that advanced planning environments require not only formal process interfaces, but also mechanisms capable of translating and integrating heterogeneous operational and financial information into a common basis for decision-making. In this sense, the identified limitations are not solely related to planning cadence or organizational structure, but also to the organization’s ability to process, align, and evaluate information across multiple dimensions simultaneously.

Another important finding relates to the role of finance within the planning process. Literature increasingly positions finance as a key integration mechanism in mature IBP environments, where financial evaluation becomes embedded throughout the planning cycle rather than being treated as a final reconciliation step (Selmi et al., 2021; Seeling et al., 2022). The empirical findings indicate that this integration remains limited in the current process, as financial implications are not consistently visible during operational planning discussions. This reduces the ability to evaluate trade-offs between profitability, capacity utilization, market allocation, and operational feasibility in a coordinated manner.

Finally, the findings also support recent literature emphasizing the growing importance of analytical capabilities, scenario planning, and decision-support tools in advanced planning environments. Kristensen and Jonsson (2018), Fakhry et al. (2024), and Sengupta et al. (2025) argue that increasing uncertainty and complexity require planning processes capable of evaluating alternative scenarios and supporting adaptive decision-making. In this context, the empirical findings suggest that stronger

integration between operational and financial planning may require not only process changes, but also analytical mechanisms capable of supporting scenario evaluation, trade-off visibility, and synchronized decision-making across functions.

7.2 Closing the gaps

The proposals presented in Chapter 6 can be interpreted as a direct response to the three gaps identified in Chapter 5: time misalignment, limited visibility and the silo trap. The proposed process and proof of concept can therefore be understood as a mechanism intended to improve the fit between planning requirements and planning capabilities.

Regarding the process proposal, establishing Cross-functional governance & Shared assumptions addresses the silo trap and could directly satisfy the need to maintain synchronized operational and financial assumptions over time. By broadening the process beyond its current volume-driven logic, it creates a cross-functional forum that reduces socio-behavioral ambiguities across departments (Shurrah and Jonsson, 2026). This is consistent with the IBP literature, which emphasizes shared ownership and integrated decision-making to align assumptions rather than relying on isolated functional planning (Schlegel et al., 2021; Seeling et al., 2022; Jurečka, 2013).

In the same vein, regarding the process proposal, the inclusion of scenario-oriented planning in the proposed process addresses the challenge of time misalignment and the broader need to cope with uncertainty. Contingency-based S&OP research suggests that scenario dimensions become increasingly important in environments characterized by dynamic and detail complexity, as they allow organizations to maintain alignment between changing assumptions and planning responses (Kristensen and Jonsson, 2018; Jonsson et al., 2021).

Additionally, generating Cross-functional financial visibility through a more integrated consensus process tackles the limited visibility gap by fulfilling the need for financial visibility across functions during planning. By bringing operational and financial perspectives into the same planning cycle, the process increases the capacity to evaluate plans not only in unit terms but also in terms of revenue, cost, and margin implications, acting as a vital two-way communication mechanism that reduces cross-functional uncertainty (Seeling et al., 2022; Schlegel et al., 2021). It is also consistent with the two-way communication role identified by Seeling et al. (2022), since a more integrated process does not only provide volume planning with earlier financial visibility, but also gives finance earlier access to operational assumptions, risks and alternatives.

The proof of concept complements the process proposal by operationalizing these design principles through an analytical mechanism. Its overall logic can be understood through the same two theoretical lenses. From a contingency perspective, the need for the tool emerges from the planning context itself, as increasing dynamic and detail complexity place higher demands on how planning information is structured, translated and used (Kristensen and Jonsson, 2018). From an OIPT perspective, the tool functions as a mechanism to better align information processing requirements and information processing capacity by integrating operational and financial

data into a coherent basis for decision support (Schlegel et al., 2021). In this sense, the proof of concept provides an information-processing mechanism that supports a more integrated planning response.

At the analytical level, the Volume-to-value translation capability & Data Alignment addresses limited visibility by fulfilling the need to translate heterogeneous planning data into a shared basis. This capability creates a structured interface that processes the high detail complexity of the operational outputs into the financial perspective required for management assessment. In line with the literature, this translation is an integrative information-processing mechanism that links demand and supply to revenue, cost, and margin implications, ensuring that planning is profit-optimized while respecting real-world supply chain constraints (Seeling et al., 2022; Shurrah and Jonsson, 2026). By making expected volume developments financially interpretable within the same analytical logic, the tool increases the visibility of operational-financial trade-offs earlier in the planning process.

The optimization layer then delivers a Trade-off evaluation capability, which directly addresses the need to evaluate trade-offs across operational and financial dimensions. By replacing sequential and partly disconnected evaluations with a formal analytical structure, this capacity mitigates the silo trap and manages the cross-functional interdependencies that generate task uncertainty. Optimization models enable this by aligning multiple planning dimensions towards common objectives, such as profitability and capacity utilization, directly within the decision-making process (Nicolas et al., 2021).

In addition, the Scenario-based financial evaluation capability responds most directly to time misalignment by satisfying the need to assess alternative scenarios under changing conditions. This capability allows users to test revised assumptions and immediately obtain both a new financial translation and a revised optimized allocation, rapidly processing dynamic complexity. This reflects the importance of adaptive and uncertainty-aware planning in advanced S&OP and IBP environments, where scenario-oriented analytical mechanisms are increasingly needed to cope with volatile environments and mitigate both supply and demand uncertainty (Kristensen and Jonsson, 2018; Jonsson et al., 2021; Schlegel et al., 2021).

Finally, the reported outcomes of the proof of concept reinforce this interpretation. The translation accuracy achieved in the case suggests that the model can generate a financially credible representation of the volume plan, despite the limitations of the proof-of-concept scope. The optimization result indicates that the analytical logic can identify economically improved planning alternatives in at least the analyzed case, while the sensitivity testing of the scenario layer suggests that the model responds coherently to changing assumptions. Interpreted through contingency theory and OIPT, these findings suggest that the proposal has the potential to close the identified gap not by removing contextual complexity, but by increasing the organization's ability to process and use planning information under that complexity. In that sense, the combined process proposal and proof of concept can be understood as a context-adapted attempt to move from a sequential and partly siloed planning design towards a more integrated, financially informed and analytically supported planning approach.

Following Schlegel et al. (2021), the process proposal and the development of the analytical tool expand the organization's IPC, enabling the processing of heterogeneous data sets and reducing the uncertainty inherent in translating "volume to economic value".

7.3 Managerial Implications and Development Path

The managerial implications proposed in this study are grounded in the empirical findings presented in Chapters 4-6, particularly the identified gaps related to time misalignment, limited financial visibility, and siloed planning execution. Together, these findings suggest that the current planning challenges are not primarily caused by the absence of planning structures, but rather by limited integration mechanisms between operational and financial planning. The recommendations presented below therefore aim to strengthen the organizational and analytical capabilities required to support more integrated planning towards IBP.

The transition towards a more integrated planning approach should be viewed as a gradual development rather than a single redesign initiative. In line with the literature, moving from a volume-driven S&OP process towards a more integrated business planning logic requires not only analytical tools, but also changes in governance, process design, data structures and planning culture (Jonsson et al., 2021). The recommendations can therefore be structured into short-, medium- and long-term priorities.

In the short term, the findings suggest that the organization would benefit from stronger cross-functional ownership and shared planning visibility. The empirical analysis showed that operational and financial planning currently operate through sequential handovers and partially synchronized assumptions, limiting coordinated decision-making. Consequently, an important first step would be to establish clearer cross-functional ownership of the integration initiative and create shared forums where operational and financial perspectives can be discussed within the same planning cycle. At this stage, a pragmatic focus on data gathering, testing and limited-scope piloting is appropriate, as it allows the organization to validate assumptions, build credibility and reduce implementation uncertainty before broader process changes are introduced.

In the medium term, the findings suggest that more formal integration mechanisms may be required to reduce the current temporal and informational disconnect between planning domains. Since financial planning currently operates at a lower update frequency than operational planning, the organization may benefit from more synchronized planning assumptions, integrated reconciliation activities, and structured scenario evaluation capabilities capable of supporting continuous operational-financial alignment. This includes clarifying roles and responsibilities, redesigning planning interfaces and aligning data structures and planning assumptions across functions. At this stage, planning should also be linked more explicitly to strategic priorities, including demand shaping and portfolio management, while scenario experimentation and risk assessment should become more structured elements of the

process. These changes would help strengthen the connection between operational planning, financial evaluation and strategic direction.

In the longer term, the findings suggest that the organization may benefit from moving towards a more continuously integrated planning environment supported by shared analytical platforms and stronger scenario-based planning capabilities. This includes developing more dynamic and iterative planning routines, reducing dependence on sequential handovers and enabling faster cross-functional evaluation of changing conditions. The proof of concept developed in this study demonstrated how analytical support can improve the visibility of operational-financial trade-offs and support faster evaluation of changing planning assumptions. Over time, the planning scope may also be extended beyond the boundaries of the focal organization, in line with the literature that points towards broader ecosystem-oriented forms of planning in more mature and dynamic settings (Jonsson et al., 2021). Together, these steps provide a practical roadmap for moving from the current process design towards a more integrated and adaptive planning capability.

While the short-term recommendations are closely linked to the proposed process and analytical solution, the medium- and long-term recommendations also address wider organizational conditions such as governance, change management, data capability, planning culture and the evolution towards more dynamic planning structures. This broader framing is consistent with the literature (Jonsson et al., 2021; Schlegel et al., 2021), which suggests that advanced forms of S&OP and IBP depend not only on process redesign, but also on organizational and technological capabilities that support sustained cross-functional integration.

8

Conclusion

This study examined how alignment between operational volume planning and financial planning can be strengthened towards Integrated Business Planning (IBP) within Volvo Group. By analyzing the current interfaces between Sales and Operations Planning (S&OP) and financial planning, the study identified the main challenges limiting operational-financial integration and developed a process proposal and analytical proof of concept to address them.

The findings revealed that operational and financial planning were only partially integrated and primarily connected through sequential information flows. Differences in planning cadence, data structures, planning assumptions, and financial visibility limited the organization's ability to evaluate operational decisions together with their financial implications within the same planning cycle. Three key challenges were identified: temporal misalignment between planning processes, limited financial visibility within operational planning, and siloed planning execution across functions.

To address these challenges, the study proposed an integrated planning approach combining process integration, volume-to-economic-value translation, and scenario-based analytical decision support. The proposed process introduces a shared operational financial planning routine, while the analytical proof of concept enables the evaluation of operational and financial trade-offs within the same planning environment. Together, these mechanisms provide the foundation for more coordinated, transparent, and profitability-oriented decision-making.

The findings suggest that improving operational-financial integration requires more than establishing formal planning interfaces. Stronger integration depends on shared planning assumptions, aligned analytical structures, improved financial visibility, and mechanisms capable of translating heterogeneous planning information across functions. From this perspective, operational-financial integration can be understood not only as a process design challenge, but also as an information-processing challenge.

The study further suggests that the effectiveness of planning integration mechanisms depends on their fit with the organizational context. The identified challenges were strongly influenced by the characteristics of the studied planning environment, including high dynamic complexity, high detail complexity, an assembly-to-order manufacturing strategy, and separated operational and financial planning structures. Consequently, the proposed response mechanisms do not aim to reduce the contextual complexity of the planning environment. Rather, they aim to improve

the organization's ability to process, evaluate, and act upon planning information under that complexity in a more timely, transparent, and coordinated manner.

Implications for Theory and Practice

This study contributes to the literature on S&OP and IBP by providing empirical insight into the challenges associated with integrating operational and financial planning in a complex manufacturing environment. The findings highlight that integration challenges are influenced not only by organizational structures, but also by differences in planning cadence, data granularity, information visibility, and cross-functional coordination.

The study also contributes by showing how combining Contingency Theory and Organizational Information Processing Theory (OIPT) could explain why planning integration becomes increasingly difficult in complex planning environments. While contingency theory helped explain the importance of adapting planning structures to contextual characteristics, OIPT helped explain how fragmented planning structures and heterogeneous planning information created information-processing challenges that limited coordinated decision-making.

In addition, the study contributes to finance integration literature by showing how volume-to-economic-value translation can function as an analytical integration mechanism between operational and financial planning.

From a practical perspective, the study demonstrates how organizations can improve operational-financial integration by combining process-oriented and analytical integration mechanisms. The findings suggest that establishing shared planning assumptions, synchronized planning routines, improved financial visibility, and cross-functional scenario evaluation capabilities are important for supporting integrated planning.

The proof of concept also demonstrated how analytical support can help organizations evaluate operational and financial trade-offs within the same planning environment. While the analytical structure was developed within Volvo Group, similar principles may also support other organizations operating in complex manufacturing and supply chain environments.

Transferability, Limitations and Future Research

While the study was conducted within Volvo Group, several of the identified challenges may also be relevant in other complex manufacturing environments. Challenges related to siloed planning structures, fragmented financial visibility, heterogeneous planning data, and misaligned planning assumptions are likely not unique to the studied case.

Similarly, the proposed logic for translating operational planning assumptions into economic value may also support organizations operating in environments characterized by high planning complexity, multiple planning dimensions, and separated operational and financial planning structures. However, the specific process design and analytical structure remain context-dependent and would need to be adapted to the characteristics of each organization.

At the same time, the study has several limitations. First, the research was conducted within a single organizational context, limiting the ability to statistically generalize the findings across industries and planning environments. Second, the proof of concept focused primarily on tactical planning and selected operational and financial variables, meaning that the model does not represent the full financial complexity of the organization. Third, the analytical model simplified several organizational and behavioral aspects of decision-making, including political, cultural, and governance-related dimensions that may influence planning integration in practice.

Future research could explore how broader financial variables, behavioral dimensions, governance structures, and more advanced real-time analytical capabilities influence integrated planning and scenario-based decision-making. Additional studies could also further investigate operational-financial integration across different industrial contexts through comparative case studies.

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A

Appendix

A.1 Interview guide Volumen Planning Process

Adapted from (Grimson and Pyke, 2007):

- Please describe your process for supply or operations planning:
 - Who is involved – organization?
 - How long is the planning horizon? And what is the frequency?
 - Are any of your suppliers involved?
 - What inputs do you use from demand forecasts?
 - What granularity is used for volume planning?
 - If there is any supplier constraint, can different plants share their stocks?
 - Which models can be produced by two different plants, and which markets have constraints to do so?
 - How does the distribution of capacity work when supplying the demand?
 - Who sees the operations plans when complete?
- What tools or platforms do you use to support the process?
- Are the demand and supply side systems linked?
- What measurements do you use to evaluate S&OP effectiveness?
- How often are measurements taken?
- How do you respond to disruptions to your demand forecast?
- How do you respond to disruptions to operations?
- Do disruptions lead to event driven S&OP or is it within the regular meetings?
- Who from senior management is involved and how?

A.2 Interview guide Financial Planning Process

- Please describe your process for financial planning:
 - What is the main outcome from this process?
 - Who is involved – organization?
 - How long is the planning horizon? And what is the frequency?
 - What inputs do you use from the areas involved?
 - What tools or platforms do you use to support the process?
 - What granularity is used for financial planning?
 - Which are the tasks/steps in the process?
- Do you manage any type of budget within the planning process?
- What components are included in Cost of Sales?
- How do you respond to changes in demand or market uncertainty?

A.3 IBP Tool

The “Overview and Financials” tab provides a high-level summary of the optimization results generated by the IBP tool. As shown in Figure A.1, it compares the baseline supply plan with the proposed optimization and highlights the overall financial impact of the changes. The first section presents the main KPIs, including units, baseline gross income, optimized gross income, and the total value added generated through the optimization. This gives decision-makers a quick overview of the potential financial improvement achieved by the proposed allocation changes.

The second section, “Financial Performance by Sales Area,” compares the baseline and optimized gross income across different sales areas. The table shows how the optimization reallocates volumes between markets to improve overall profitability.

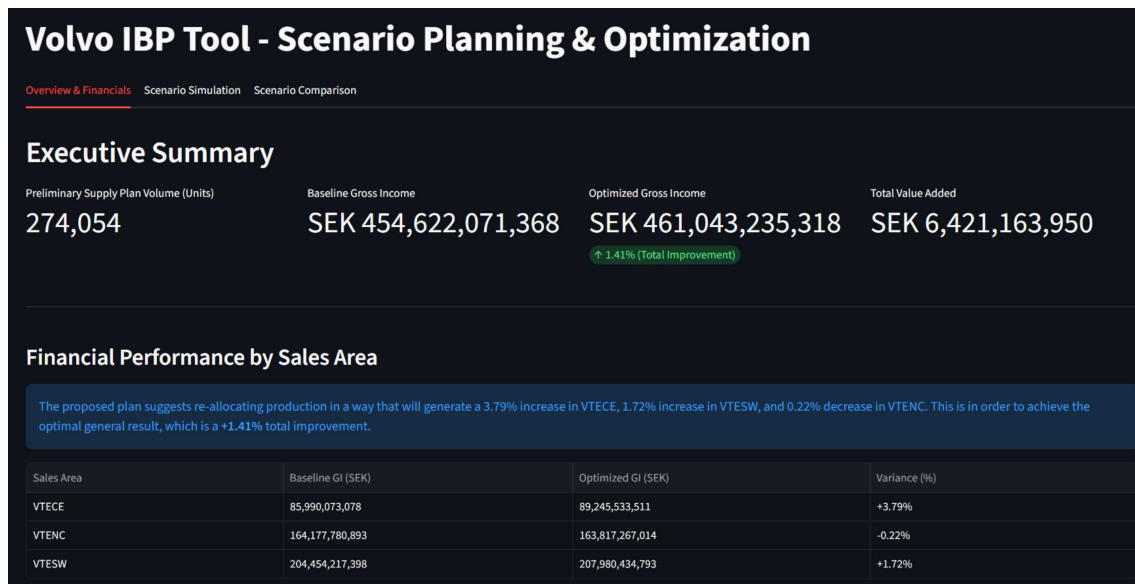


Figure A.1: Overview and Financial Performance

The following sections visualize production shifts between plants and sales areas.

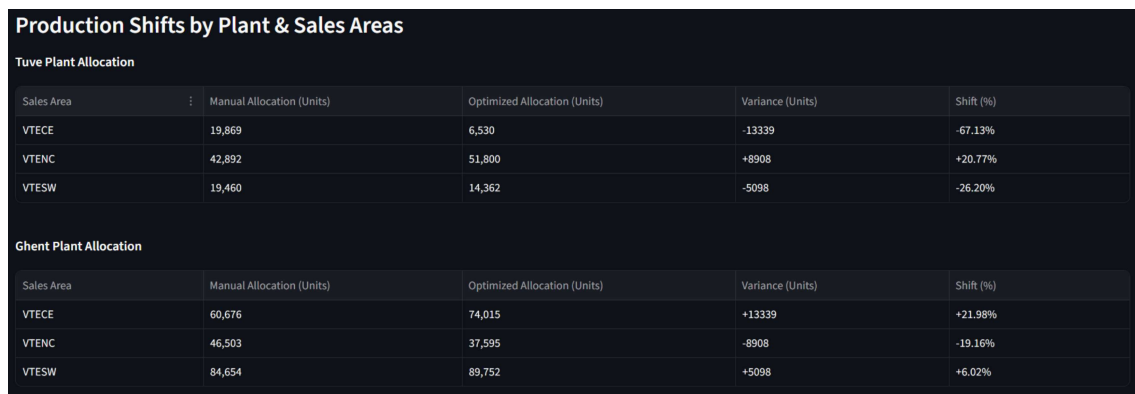


Figure A.2: Production Reallocation by Plant and Sales Area

The tables illustrated in Figures A.2 and A.3, show how production volumes are

A. Appendix

redistributed between plants in the optimized scenario compared to the manual allocation, including the percentage increase or decrease in production volumes.

Finally, the “Flexibility Penalty Analysis” section in Figure A.3 presents the additional flexibility costs associated with production adjustments during the first six months of the planning horizon. This allows users to evaluate the trade-off between higher profitability and operational flexibility costs.

Production Volume Allocation by Plant

Assembly Plant	Manual Allocation (Units)	Optimized Allocation (Units)	Shift (%)
Tuве	82,221	72,692	-11.59%
Ghent	191,833	201,362	+4.97%

> View Month-by-Month Detail

Flexibility Penalty Analysis (Months 1-6)

Cost Driver	Baseline Cost (SEK)	Optimized Cost (SEK)	Variance (SEK)
Assembly Flexibility Penalty	705,958,073	721,065,266	+15,107,194
Component Flexibility Penalty	1,543,850,205	1,543,850,205	+0

Figure A.3: Production Reallocation by Plant and Flexibility Penalty Analysis

The “Scenario Simulation” tab, as shown in Figure A.4, allows users to create and evaluate alternative planning scenarios by modifying operational and financial assumptions directly in the tool.

The first section contains editable input tables for volume demand and gross profit parameters across different plants, sales areas, product classes, and planning months. Users can manually adjust demand levels or profitability assumptions to simulate changes in market conditions, pricing strategies, or product mix.

Volvo IBP Tool - Scenario Planning & Optimization

Overview & Financials **Scenario Simulation** Scenario Comparison

Scenario Simulator

Edit the tables below to override baseline assumptions. You can type directly into the cells.

Volume & Gross Profit Parameters

Values are now ABSOLUTE. Enter physical truck units and absolute Gross Profit amounts.

Volume Demand (Units)

Plant	Sales Area	Product Class	202501	202502	202503	202504	202505	202506	202507	202508	202509	202510	202511	202512
Ghent	VTECE	BEV	6	6	22	16	16	16	6	22	28	16	33	16
Ghent	VTECE	ICE	5299	5697	5857	6111	5023	5592	2848	4168	5376	5504	4957	4041
Tuве	VTECE	BEV	0	0	0	6	6	6	6	6	0	6	6	6
Tuве	VTECE	ICE	1882	1733	1562	1623	2131	1899	767	1860	1706	1794	1650	1214
Ghent	VTENC	BEV	232	210	177	188	182	243	166	315	381	442	337	265
Ghent	VTENC	ICE	3555	4068	3930	4466	4035	3974	1640	2616	3831	4664	3732	2854
Tuве	VTENC	BEV	243	270	282	337	248	381	188	342	342	552	392	260
Tuве	VTENC	ICE	2810	3522	3323	3632	3456	3483	1529	2462	3527	4422	3765	3124
Ghent	VTESW	BEV	94	55	66	83	99	88	50	61	122	99	77	77
Ghent	VTESW	ICE	6746	6746	6734	7938	6133	7358	4515	5459	8655	9533	7938	5928

Figure A.4: Scenario Simulation Tab – Volume Demand Input Parameters

The second section, as illustrated in Figure A.5, includes variance and flexibility parameters. Here, users can define percentage changes related to conversion costs, inbound and outbound freight costs, and production flexibility costs. These inputs make it possible to test the impact of operational disruptions, cost increases, or capacity adjustments on the overall plan.

Gross Profit per Unit (SEK)													
Sales Area	Product Class	202501	202502	202503	202504	202505	202506	202507	202508	202509	202510	202511	202512
VTECE	ICE	928807	933495	884809	869325	947918	1011991	1259154	1231439	1313395	1231846	1499767	1628918
VTECE	BEV	2474936	543122	3416920	3499988	2619344	2310453	1971176	2767359	2182083	309108	4192816	3411938
VTENC	ICE	1862303	1890276	1926425	1901512	1932180	1902447	1986919	1998419	1954524	1966383	1999615	2028062
VTENC	BEV	2460992	2351655	2487820	2102611	2164662	2076179	813043	858673	891311	326184	341903	328215
VTESW	ICE	1822605	1986974	2019318	2142823	2068548	2072662	2082868	2136140	2021742	2083791	2116234	2163053
VTESW	BEV	-1041012	-1544473	-1267050	-2081045	-2135582	-1738539	-2013335	-1918452	-1290348	-1539866	-1656938	-1598494

Variances & Flexibility Parameters							
Plant	Product Class	Month	% Conversion Variance	% Inbound Freight Variance	% Outbound Freight Variance	% Flexibility	
Tuve	ICE	202501	-0.4661	-0.0938	0.0578	0.05	
Tuve	ICE	202502	-0.2562	0.0476	0.0221	0.05	
Tuve	ICE	202503	-0.1375	0.0387	0.0537	0.05	
Tuve	ICE	202504	-0.2593	-0.0339	-0.0838	0.05	
Tuve	ICE	202505	-0.202	-0.0521	-0.1489	0.05	
Tuve	ICE	202506	-0.1554	-0.0505	-0.0633	0.05	
Tuve	ICE	202507	-0.4769	-0.241	-0.227	0.05	
Tuve	ICE	202508	-0.2622	-0.0128	-0.1728	0.05	

Figure A.5: Scenario Simulation Tab – Gross Profit and Cost Variance Parameters

Once the assumptions are updated, the user can run the optimization model through the “Run Scenario Simulation” function. The tool then recalculates the optimized allocation and financial outcomes based on the modified scenario. As shown in Figure A.6, after the simulation is completed, the tool displays a summary of the altered parameters together with updated financial KPIs, including the scenario baseline plan, optimized plan, and total value added generated by the optimization. Finally, the scenario can be saved for further evaluation and comparison.

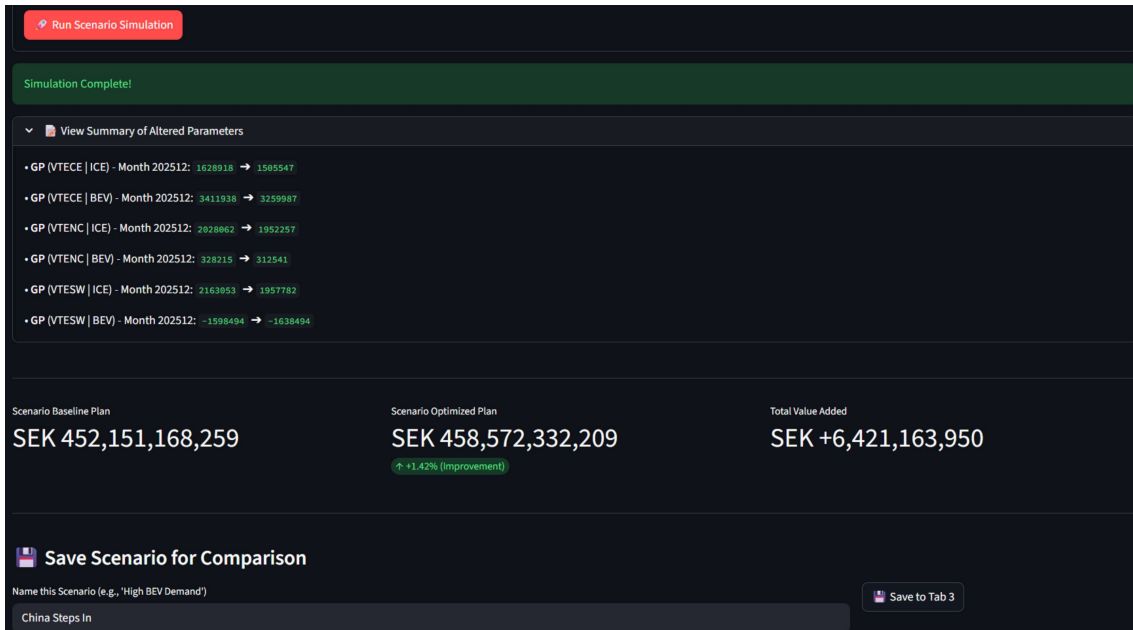


Figure A.6: Scenario Simulation Results

Figure A.7 presents the “Scenario Comparison” tab, which allows users to compare saved simulation scenarios with the original optimized baseline plan. The first section provides a high-level financial comparison between the baseline optimization and the selected scenario, including total optimized gross income and the percentage difference between both plans. The second section compares financial performance by sales area, showing how gross income changes across markets under the simulated scenario. This tab supports scenario-based decision-making by helping users evaluate the financial impact of different operational and commercial assumptions.

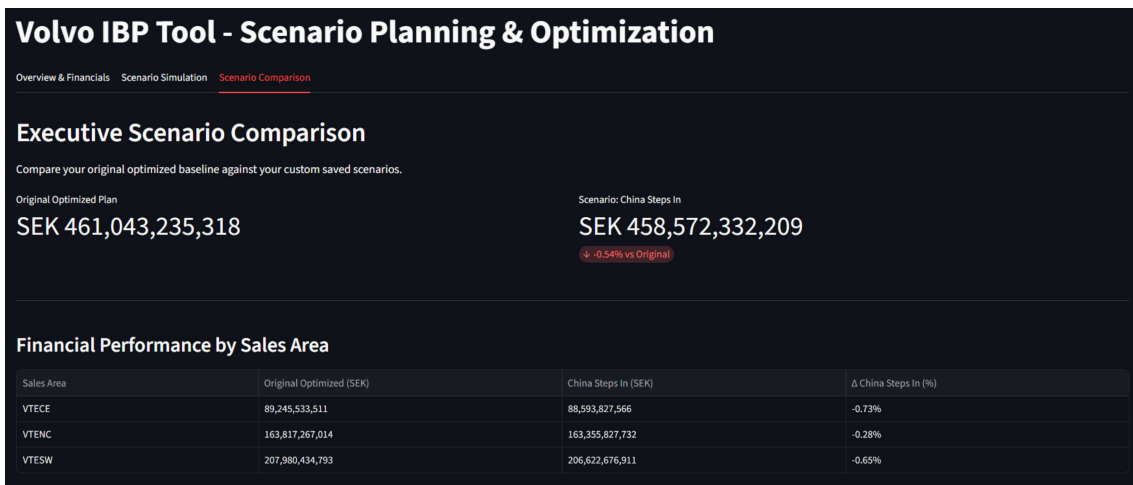


Figure A.7: Scenario Comparison

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