Integrated Business Planning Process: Link Between Supply Chain Planning and Financial Planning

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Abstract. In this paper, we explore the interactions between supply chain planning and financial planning. To do so, we investigate the integrated business planning (IBP) process as a suitable interface between them. We focus on the French business culture. First, we provide the results and conclusions of a survey on the structure and details of the sales and operations planning (S&OP) processes of five top French multinational corporations and the extent to which finance is integrated into these processes. These companies have achieved a revenue of over 16 billion euros in 2020. Then, we conclude on the steps that the participating companies have implemented to transition from the traditional S&OP process to the complete IBP process, and thus on the steps that remain to be taken. We note that all participating companies have taken their first steps towards adopting an integrated business planning approach. They have all embraced scenario analysis. However, they are lagging behind on the other steps that require cross-functional and cross-company collaboration, such as financial integration. Finally, we define how the IBP process interacts with financial planning on four fronts, namely revenue and costs budgeting, monthly updates to budgets, capital expenditures budgeting, and working capital requirements planning.

Keywords: Sales and operations planning, Integrated business planning, financial planning.

1 Introduction

Supply chain management operates by implementing actions and decisions at three managerial levels, namely, strategic, tactical, and operational. These decisions are related to the different levels of a supply chain (upstream, internal, and downstream) as well as to the processes at each of these levels. They are varied in nature and form the basis for steering a supply chain [1]. These decisions generally influence the supply chain organization and the planning of its activities. Strategic decisions are made with a long-term horizon (generally 3 to 5 years with annual granularity). They include questions of supply chain design and strategic choices of partners. Tactical

planning decisions are made over a medium-term horizon (12 to 24 months with monthly granularity) and concern demand and supply balancing. Operational decisions are made over a short-term horizon (6 to 16 weeks with a weekly granularity) and concern operational planning issues (procurement plan, master production schedule, distribution resource planning, etc.). Operational execution addresses very short-term issues, such as scheduling. As supply chain management's approach began to evolve from functional to holistic and from intra-organizational to inter-organizational, links to the financial aspects of supply chains and their management become the focus of research and business. Despite this, a comprehensive map of the interactions between supply chain planning and financial planning is still lacking in the literature.

In this paper, we examine these interactions by investigating the integrated business planning (IBP) process as their potential framework. The IBP literature highlights the importance of financial integration within the process. However, it does not offer descriptive or prescriptive studies on organizational practices. To remedy this, we present a case study conducted with top French multinational companies.

The remainder of this study is structured as follows. Section 2 presents the traditional sales and operations planning (S&OP) process. Section 3 introduces the IBP process. In section 4, we provide the results and conclusions of our case study. Finally, in section 5, we explain our conclusions regarding the relationship between the IBP process and financial planning.

2 Traditional Sales and Operations Planning Process

The idea of the S&OP process emerged in the 1970s with the work of the business consultants Oliver Wight and Tom Wallace [2]. Conceptually, the S&OP process evolved from aggregate production planning (APP) to manufacturing resources planning (MRP II) ([3]; [4]). The traditional S&OP process focused on customer service and inventory. To manage them effectively, the drivers, namely demand and supply, must be aligned ([5]; [6]; [7]; [8]). Hence, the main objective is to consolidate planned demand and to guarantee that it can be supplied by manufactured products in the medium-term to long-term planning horizon at an appropriate aggregated planning level. This helps companies create a demand and supply plan that is technically feasible using the resources of the company, cross-functionally agreed upon, and unique [9]. In practice, the traditional S&OP process represents a monthly, rolling, and multistage decision-making process with a typical planning horizon between 12 and 18 months. During the month, three meetings are held: A sales planning meeting called demand review and led by the sales manager, a supply review organized by the manufacturing, and an S&OP meeting. The output of the S&OP process is an operating plan, which is generally a consolidated view of sales, production, and inventories by month on a volume basis. Then, following the S&OP meeting, some reconciliation of volumes with financials is done to check against the budget.

After the first wave of implementation, the excitement faded. The traditional S&OP process began to be seen as a mere logistics exercise focusing on a simple

demand and supply volume planning with too much detail [10]. Demand planners, often associated with the supply chain function, led the demand review with little inclusion of the sales and marketing functions. In fact, the single operating plan was the supply chain managers' objective. Finance and general management were most interested in planning and analyzing financial scenarios. Therefore, without a tangible financial link, volume forecasts became less of a priority than financial forecasts. Besides, the budget was given priority in this context, overruling any decisions made as part of the S&OP process. Moreover, many companies were increasingly driving innovation and responsiveness to customer needs. However, the traditional S&OP process was not developed to accurately forecast demand for new products and integrate it into the overall demand plan.

3 Evolution Towards The Integrated Business Planning Process

IBP is also commonly referred to as advanced S&OP. The new name reflects significant changes to the existing one. The IBP process represents the evolution of the S&OP process from its production planning origins to a fully integrated management and supply chain collaboration process [11]. The development of the S&OP process towards the IBP process started with the introduction of financial integration. The integration of product and portfolio management was the second evolutionary change. In fact, in the traditional S&OP process, product management was often seen as a separate creative process belonging to the R&D or marketing function, hence excluding an important business planning aspect. These two steps were shortly introduced after the S&OP process appeared. Equally, scenario analysis, which consists of examining the impact of potential changes on the entire company and making comparisons with strategy, represents a substantial advance over simple supply and demand planning. The latest evolution is the increased collaboration along the end-to-end supply chain to manage demand effectively and thus link suppliers and customers S&OP processes.

The goal of an effective S&OP process has always been to achieve alignment. Still, whereas the traditional S&OP process was simply aligning sales and manufacturing, the IBP process aligns sales, marketing, R&D, operations, purchasing, logistics, finance, HR, and even IT. Therefore, the IBP process is a decision-making process that realigns tactical plans for all business functions in all geographies (local, regional, and global) and in all business sectors (manufacturing, retail, and service) at an appropriate aggregated planning level (product family, brand, etc.). It has a minimum 24-month rolling planning horizon [12]. It is based on a monthly cycle of business reviews: product management, demand, supply, integrated reconciliation, and the management business review. These are not a simple sequence of meetings but an ongoing process of coordinating those accountable for reviewing, presenting, and communicating progress and change. Besides, they need to be action-oriented. Thorough preparation is required to identify the issues and scenarios to be discussed before each meeting. In this way, decisions can be made efficiently and updated plans approved before rendered available throughout the integrated process.

The Product Management Review focuses on product planning, which includes analyzing the product lifecycle, understanding where products fit into this cycle, and optimizing the product portfolio to decide to launch or discard products [13]. The objective of the demand review process is to agree upon a complete, unconstrained, and consolidated view of the expected demand situation in the medium-term to long-term planning horizon. It considers sales, marketing, and supply chain actions aimed at shaping demand to ensure that sales, profit, and service quality targets are met [14]. The supply review process's main objective is to match the updated demand plans with production, logistics, and procurement capabilities. It aims to identify potential pitfalls that hinder the development of a technically feasible supply plan and to find solutions that consider the company's financial objectives [13]. The integrated reconciliation is a continuous transversal process where gaps with financial goals and their implications are identified, understood, and addressed throughout the product, demand, and supply review processes. Scenario modeling and simulation are the basis for the integrated reconciliation process [15]. The integrated reconciliation meeting is the last opportunity to reach a cross-functional agreement. The management business review is the final decision-making meeting in the monthly IBP cycle. This meeting addresses gaps with respect to financial and strategic plans. Senior management needs to arbitrate between scenarios based on financial forecasts and make decisions concerning unresolved issues [16].

4 Survey

The conducted survey took place as a part of the activities of the supply chain Chair regrouping our research team and top five French multinational corporations from various business lines. In the following, we call them A, B, C, D, and E, where A is a retail chain, B is a luxury goods company, C is an aeronautics manufacturer, D is a pharmaceutical company, and E is a perfumes and cosmetics retailer. These companies have achieved a revenue of over 16 billion euros in 2020. In total, twelve senior managers with an operational or financial background and affiliated with the supply chain function were approached and participated in semi-structured interviews.

The objective of this survey is to investigate the structure and details of their S&OP processes and the extent to which finance is integrated into these processes. Company A, which does not have an S&OP process, was promptly dropped from the study. Company C has a process for each of its five subsidiaries. Here, we focus on two of them, namely C1 and C2.

4.1 Processes Structure

The following questions were prepared as a guide for discussions: Is your process formalized? Who is the process owner? What is the main objective of your process? What is the frequency of your process? What is the planning horizon? At what geographical level is your process conducted? At which aggregation levels does planning take place? Are there any KPIs to measure the efficiency of the process? Does the process include the product management review?

Table 1 summarizes the participating companies' answers.

Table 1. Survey on S&OP structure

	B	C1	C2	D	E
Formalization	None	ARCI matrix	ARCI matrix	ARCI matrix	ARCI matrix
Objective	Balancing production capacity and sales objectives	Matching production load and capacity	Matching production load and capacity	Balancing demand and supply	Aligning the sales vision between finance, marketing, and supply chain
Planning horizon	12 to 18 months	5 years	24 to 36 months	12 to 18 months	3 months
Frequency	Monthly	Monthly	Monthly	Monthly	Monthly
Geographical level	World	World	World	Country and region	Country
Aggregation levels	Product activity and industrial typology	Product family and large customer	Product family	Product and distribution channel	Product category, brand, and product family
Process owner	Global distribution manager	Group supply chain methods manager	Supply chain manager of the subsidiary	Regional supply chain manager	Country supply chain manager
Process efficiency KPIs	None	S&OP stability (Adherence to time schedules)	S&OP stability (Adherence to time schedules)	No KPIs but an internal audit	None
Product management review	Yes	No	Partial	Yes	Partial

A prerequisite for a well-functioning S&OP process is a complete and widely shared formalization. This is the case for most participating companies that use an ARCI matrix to define each stakeholder's responsibilities. However, another essential success factor is to define and monitor KPIs on the efficient execution of the process. This is currently lacking in most participating companies. These KPIs may include decisions in time, people and information availability, and quality of information.

Moreover, choosing an adequate level of aggregation at which planning takes place significantly affects the efficiency and performance of the S&OP process. The participating companies plan their S&OP volumes mainly at an aggregated level corresponding to a product structure such as product families and brands. The industrial ones usually use two product structures. First, the demand plan is usually created based on a sales-oriented product structure, reflecting sales and marketing considerations. Second, the supply plan is usually created based on a production-oriented product structure, reflecting industrial resources and technologies needed. When constructing the supply plan from the updated demand plan, these two structures must be matched. However, conversion difficulties occur often.

Company D is the only company to have a process at several geographical levels. It points out the complexity of synchronizing local and regional processes, which is a recurring issue in this configuration. One of the consequences is the existence of a one-month delay between the two levels. This is an organizational and technological issue caused by the absence of an information system to integrate and coordinate both processes.

4.2 Financial Integration

To achieve full financial integration within the IBP process, the following requirements must be met:

- The finance function needs to be involved in all the process reviews (I).
- A financial assessment of all volumes is necessary (II).
  - During the product management review, changes in the product pipeline and portfolio must be translated in terms of projections of sales revenue.
  - During the demand review, sales volume forecasts need to be translated in terms of projected revenues and associated marketing costs.
  - During the supply review, produced or procured volumes need to be translated in terms of cost of goods sold (COGS), distribution costs, and overhead costs. Moreover, the evolution of the value of all inventories needs to be measured.
- During the reconciliation meeting, discussions and scenario analysis need to be based on revenue, margin, and working capital projections analysis (III).
- Financial KPIs need to be defined and monitored (IV). These may include budget vs. projected sales forecast, overhead costs as a percentage of revenue, distribution costs as percentage of revenue, EBITDA/EVA, working capital utilization, etc.

The following questions were prepared to see if the participating companies are fulfilling these requirements: In which reviews does the finance function participate? Does the process include scenario analysis? Are sales revenues and costs tracked? Are changes in inventory levels tracked? Are changes in working capital requirements (inventory value) tracked? Are investments discussed during certain reviews? Are the revenue and costs budgets updated?

Table 2 summarizes the participating companies' answers.

Table 2. Survey on financial integration.

	B	C1	C2	D	E
Finance function participation	Management business review	No	No	No	S&OP meeting
Scenario analysis	Yes	Yes	Yes	Yes	Yes
Tracking sales revenues and costs	Yes	No	Yes	Yes	Yes
Tracking inventory levels	Yes	No	Yes	No	Yes
Tracking Working Capital Requirement (inventory value)	No	No	Yes	No	Yes
Discussing investments	Yes	No	No	Yes	No
Updating revenue and costs budgets	No	No	No	No	No

By crosschecking the responses of the participating companies with the requirements described above, we present, in Table 3, an assessment of the degree of financial integration in the S&OP processes of the participating companies. We provide a qualitative evaluation. A company's fulfillment of a requirement is graded into three levels: Absent when it does not meet any aspect of the requirement described above, partial when some of the requirement is met, and complete when all aspects are met.

The degree of financial integration is established in the same way. It is absent when all requirements are rated absent, partial when at least one requirement is rated partial and complete when all requirements are fully met.

Table 3. Degree of financial integration.

	I	II	III	IV	**Financial integration**
B	Partial	Partial	Absent	Absent	**Partial**
C1	Absent	Absent	Absent	Absent	**Absent**
C2	Absent	Partial	Partial	Absent	**Partial**
D	Absent	Partial	Partial	Absent	**Partial**
E	Partial	Partial	Partial	Absent	**Partial**

We notice a growing interest in translating volume forecasts into financial forecasts. This reflects a growing awareness among supply chain managers of the importance of reconciliation with finance. In contrast, the finance function's absence reflects a low interest and ignorance of the potential S&OP process's impact on financial aspects. This also explains the difficult accessibility to financial data by supply chain managers and the absence of financial KPIs.

4.3 Transitioning to Integrated Business Planning

As mentioned in Section 3, four steps must be completed for the company to fully transition from the traditional S&OP process to the IBP process. Based on the results of the two parts of the survey, we identify the steps each company has taken to adopt the IBP process. We use the same evaluation scale as in the previous analysis. Table 4 summarizes the outcome of this study.

Table 4. Transitioning to the IBP process

	Scenario analysis	New product integration	Financial integration	Supply chain collaboration	**Transitioning to the IBP Process**
B	Complete	Complete	Partial	Absent	**Partial**
C1	Complete	Absent	Absent	Absent	**Partial**
C2	Complete	Partial	Partial	Absent	**Partial**
D	Complete	Complete	Partial	Absent	**Partial**
E	Complete	Partial	Partial	Absent	**Partial**

We note that all companies have taken their first steps towards adopting an integrated business planning approach. They have all embraced scenario analysis. Companies B and D are the most advanced in their transition project, followed by companies C2 and E. Subsidiary C1 lags behind the others, but this can be explained by the nature of its products, which have a very long life cycle and R&D phase. In addition, all its orders are fixed for five years. We can also conclude that, in the context of the sample studied, the more the steps require cross-functional and cross-company collaboration, the more difficult the implementation becomes.

5 Links Between Integrated Business Planning and Financial Planning

In addition to the semi-structured interviews, focus group sessions were held to understand how integrated business planning interacts with financial planning. We concluded that the IBP process interacts with financial planning at four levels, namely revenue and costs budgeting, monthly updates to budgets, capital expenditures budgeting, and working capital requirements planning.

Revenue and costs budgeting is still an essential task, even though it is time-consuming for managers. It usually requires multiple iterations until the figures (revenues and costs) are adjusted and correspond to senior management's expectations. The IBP process cannot replace the budgeting process and the need for multiple adjustment iterations, but it can be very useful for the first set of inputs. Without the IBP process, budgeting starts with the actual year-to-date sales data, previous historical years sales data, information about future customers and trends, and an estimation of future growth. With the IBP process, the product, demand, supply, and inventory plans for the next fiscal year are used as primary inputs into the budget process. These plans being aligned reflect future reality far better than raw sales forecasts. The use of outputs from the IBP process is more persuasive to senior managers because they are involved in the decision-making process. This can help reduce the number of iterations during the annual budgeting process.

As discussed above, finance has an important role throughout the entire IBP process. It explains the financial implications of product, demand, and supply plans potential changes, starting by transforming volume assumptions into economic assumptions regarding costs and revenues. Afterward, finance gradually establishes a com-

prehensive assessment of the company's financial health over the planning horizon and identifies gaps in relation to financial plans (especially the budget) and strategy. This assessment should include profit and loss projections, margin projections, and cash flow analysis. After validation by senior management of the revised financial forecasts, budgets are updated.

The majority of logistic and industrial investments are needed to accommodate product volumes that are part of both current or future demand and supply plans. Linking the capital planning and justification process with the IBP process ensures that all capital investment decisions are based on the latest, most robust, and most accurate product volume plans. In this case, all needs for logistic and industrial investments are initiated by the IBP process results. Nevertheless, studying each investment's profitability and making the final decision are carried out within the capital budgeting process. The main obstacle to achieve this synchronization is that capital budgeting is usually annual and sometimes updated in the middle of the year, whereas the IBP is monthly.

Implementing the IBP process usually leads to significant inventory reductions, which results in cash flow improvement. Moreover, continuously balancing supply and demand ensures optimal inventory levels. Therefore, the IBP process can be considered as an important lever to manage working capital. It provides a simple and effective mechanism for communicating inventory targets to the entire company and ensuring they are respected.

6 Conclusion

The literature does not offer descriptive or prescriptive studies on organizational practices related to financial integration within the S&OP process. To remedy this, we present in this paper a case study conducted with multinational companies with focus on top French corporations. A survey is conducted to explore the structure and details of these companies' S&OP processes and the extent to which finance is integrated into them according to requirements we have defined. We also conclude what steps the participating companies have implemented to adopt the complete IBP process. And thus, what steps remain to be taken and need to be addressed. We note that all participating companies have taken their first steps towards adopting an integrated business planning approach. They have all embraced scenario analysis. However, they are lagging behind on the other steps that require cross-functional and cross-company collaboration, especially, financial integration, and supply chain collaboration.

After further discussions sessions with the interviewees, we conclude that implementing a complete IBP process is the bridge between supply chain planning and financial planning. Besides, complete financial integration is the first step. Finally, we explain how the IBP process interacts with financial planning on four fronts, namely revenue and costs budgeting, monthly updates to budgets, capital expenditures budgeting, and working capital requirements planning.

In most companies, the initial budget is established in a multi-month process, whether it is the revenue and cost budget or the capital expenditures budget. Besides,

they are usually updated once or twice a year. Linking these updates to the IBP process presumes it will be done monthly. Certainly, it is no easy task to revise all of these data monthly and share them with all members of the organization. This requires a solid and widely shared information system. Furthermore, all these organizational challenges require more empirical research.

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