Revenue operations & AI

What is sales and operations planning (S&OP)?

S&OP is the process, run at least monthly, in which sales, operations and finance turn an unconstrained demand view into one approved, deliverable plan.

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Management summary

Sales and operations planning (S&OP) is a cross-functional decision process, run at least monthly, that reconciles an unconstrained view of demand with supply capacity and financial targets and ends in one approved plan, usually at product-family level. Two systematic reviews describe its inputs, its meeting cycle and six coordination mechanisms, and the reviews held find thin evidence on performance: only six of 55 reviewed papers analyzed the effect on the firm (Tavares Thomé et al., 2012a). In the one in-depth case the reviews single out, the functions aligned while their incentives stayed misaligned; in the second half of 2003 the statistical forecast was more accurate than the approved consensus, yet the firm's demand management leadership was reluctant to streamline the consensus process (Oliva and Watson, 2011).

Contents

§ 1 What is sales and operations planning (S&OP)? 3
§ 2 Which plans meet in S&OP, and over what horizon? 4
§ 3 How does a monthly S&OP cycle run, and what closes it? 5
Figure 1 S&OP coordination framework categories: share of academic and practitioner articles that discuss each one 7
§ 4 How did one company run S&OP while its incentives still pulled apart? 8
Figure 2 How Leitax ran its monthly S&OP cycle 9
§ 5 What changed at Leitax, and how far does one case carry? 10
Figure 3 S&OP case evidence at Leitax: forecast accuracy and on-time delivery at the 2002 go-live and in fall 2003 11
§ 6 What does the research show about S&OP and company performance? 13

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Figure 4 S&OP evidence map: what each held source examines and where it stops 17
§ 7 How can a commercial leader check the S&OP cycle they sit in? 19
Figure 5 An S&OP cycle worksheet for the commercial side of the meeting 20
References 21

What is sales and operations planning (S&OP)?

§ 1 of 7

Sales and operations planning (S&OP) is the cross-functional decision process, run at least monthly, in which sales, marketing, operations and finance reconcile their view of demand with supply capacity and financial targets, and leave with one approved plan, usually set at product-family level for the coming months . The plan it produces is not a forecast of what customers will buy. It is the organization's decision about what it will sell, make, buy and hold in stock, and with what financial result . This guide adds one design condition from the case examined below: the demand view stays free of capacity limits (Oliva and Watson, 2011, p. 440)[2], so that the trade-off is decided rather than hidden. The reviews do not make it part of the definition .

2 Oliva, R., & Watson, N. (2011). Cross-functional alignment in supply chain planning: A case study of sales and operations planning. Journal of Operations Management, 29(5), 434–448.

Two systematic reviews of the research literature define S&OP in close to the same terms. Tavares Thomé et al. (2012a, p. 1)[3] open their synthesis with: "Sales and operations planning (S&OP) is a tool that unites different business plans into one integrated set of plans. Its main purpose is twofold: (1) to balance supply and demand and (2) to build bridges between the business or strategic plan and the operational plans of the firm." Tuomikangas and Kaipia (2014, p. 243)[5] call it "a key business process to match customer demand with supply capabilities in the medium term" . The practitioner definition that Tavares Thomé et al. (2012a, p. 2) quote from the APICS dictionary (Cox and Blackstone, 2002, as cited in Tavares Thomé et al.[4], 2012a, p. 2) adds the cadence and the level of detail: "The process brings together all the plans for the business (sales, marketing, development, manufacturing, sourcing, and financial) into one integrated set of plans. It is performed at least once a month and is reviewed by management at an aggregate (product family) level."

3 Tavares Thomé, A. M., Scavarda, L. F., Fernandez, N. S., & Scavarda, A. J. (2012a). Sales and operations planning: A research synthesis. International Journal of Production Economics, 138(1), 1–13.

4 Tavares Thomé, A. M., Scavarda, L. F., Fernandez, N. S., & Scavarda, A. J. (2012b). Sales and operations planning and the firm performance. International Journal of Productivity and Performance Management, 61(4), 359–381.

5 Tuomikangas, N., & Kaipia, R. (2014). A coordination framework for sales and operations planning (S&OP): Synthesis from the literature. International Journal of Production Economics, 154, 243-262.

Three neighboring ideas are often confused with S&OP and are kept apart here:

- **A sales forecast:** A forecast estimates what will sell for a named unit and period before the actual is known (what sales forecasting is). S&OP takes such estimates as inputs and decides what the organization commits to .
- **A forecast category:** A CRM label such as Commit records how a seller rates one deal (forecast categories). It does not test whether production, suppliers and inventory can deliver the quarter that the deals add up to .
- **Sales capacity planning:** The capacity S&OP reconciles with demand is supply capacity: production, materials, suppliers, inventory and delivery . How many productive selling hours a salesforce has is a separate model, covered in the sales capacity planning guide .

Which plans meet in S&OP, and over what horizon?

§ 2 of 7

Tavares Thomé et al. (2012a, pp. 2, 8, 9)[3] find most S&OP planning done at product-family level, some of it by SKU, over horizons from under three to over 18 months, “usually situated between 6 and 18 months” (p. 9) . Most of the reviewed papers that cover the planning function place S&OP at the tactical level, between the corporate strategic plan and operations: “However, the dominant perception of the role of S&OP is at the tactical level.” (p. 9)

The review cross-classified the inputs that its 55 papers name, by area (demand, source, production, delivery and finance) and by type (plans, constraints and other inputs) (Tavares Thomé et al.[4], 2012a, Table 3, pp. 6, 7, 9)[3] . On the constraint side, “Production capacity is one of the most relevant operations restrictions to the S&OP process.” (p. 10) Finance enters “mainly as budgetary restrictions and as financial goals (product margins and profitability)” (p. 10) .

Counted across the 55 papers, integrated demand and functional plans appear as an input in 44, inventory plans in 41, an integrated production or capacity plan in 21, integrated sales and demand forecasts in 15, and procurement and supply plans in 8 (p. 10). These are counts of papers,

not of companies: they show what the literature chose to describe, not how many firms include each plan . Finance was the plan the literature least often treated as an input, “with only six papers clearly quoting finance planning as a key input into the S&OP process” (p. 10), and the authors name the integration of the finance function as a question that “warrants further research” (p. 11) . In a search run to January 2019, Kreuter et al. (2022, online-first p. 29)[1] still list finance among the “non-traditional” stakeholders whose role in S&OP only a few studies examine .

1 Kreuter, T., Scavarda, L. F., Thomé, A. M. T., Hellingrath, B., & Seeling, M. X. (2022). Empirical and theoretical perspectives in sales and operations planning. Review of Managerial Science, 16(2), 319–354. Online First, published online 2021.

The distinction this guide puts at the center is between an unconstrained view of demand and the plan that results once capacity and targets have been applied. Oliva and Watson (2011, p. 439)[2] describe the planning process of a consumer electronics firm they call Leitax, which failed in part on this point; among its defects: “Faulty forecast process features included forecasting capacity shortages instead of unconstrained demand” . In the process that replaced it, the three demand forecasts were built without capacity limits on purpose, because forecasts shaped by perceived capacity had become “self-fulfilling prophecies” (p. 440) . A demand view that already contains the capacity limit hides the trade-off. Keeping it unconstrained makes the gap between demand and supply something the meeting has to decide on .

How does a monthly S&OP cycle run, and what closes it?

§ 3 of 7

Tavares Thomé et al. (2012a, p. 10)[3] report the five-step monthly sequence described in a 2008 practitioner article by Wallace and Stahl in the Journal of Business Forecasting (as cited in Tavares Thomé et al.[4], 2012a, pp. 10, 13), which the synthesis passes on as a description, not as a tested standard :

1. **Data gathering:** actual supply and demand, inventory, backlog and statistical forecasts are gathered and reviewed.
2. **Demand review:** the demand plan is reviewed.
3. **Supply review:** the supply plans are revised against it.
4. **Pre-executive meeting:** decisions, recommendations, scenarios and the agenda for the executive meeting are reviewed.

5 **Executive meeting:** “The executive S&OP meeting closes the monthly process.” (p. 10)

The reviewed papers do not agree on the rhythm. “Meeting regularity varied from monthly to weekly”, and some authors argue for a move from regular to event-driven meetings (Tavares Thomé et al.[4], 2012a, p. 10)[3] . On who sits at the table, the synthesis finds that “cross-functionality was sought through joint participation in meetings and communication channels by marketing, sales, production, logistics, sourcing, and to a lesser extent, finance” (p. 10), and it concludes: “There is no single rule, but authors agree on the need to define formal S&OP teams; to empower participants; and to ensure the participation of top management, key customers, and suppliers from the beginning of the process.” (p. 11)

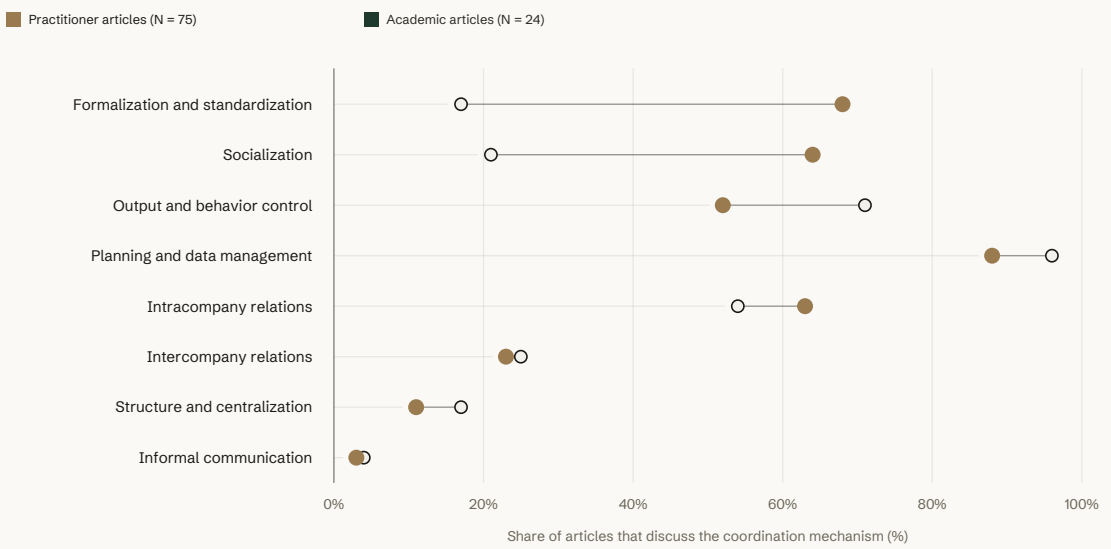
Tuomikangas and Kaipia (2014, pp. 254, 255)[5] condense the academic articles in their review into six coordination mechanisms, drawing on the practitioner literature for the last two, which together describe what an S&OP process consists of beyond its meetings :

1 **S&OP organization:** who takes part and who decides: decision rights, centralization and roles (p. 254).
2 **S&OP process:** how the sub-plans are created, communicated and decided between functions (p. 255).
3 **S&OP tools and data:** a common, validated set of data fit for the decision (p. 255).
4 **Performance management:** financial, operations and process measures, with targets and follow-up (p. 255).
5 **Strategic alignment:** the link from operational plans to strategic targets (p. 255).
6 **S&OP culture and leadership:** commitment, trust, top management setting an example, empowerment and handling conflict (p. 255).

Their summary for practice splits these into two halves: “the hard side, consisting of formal procedures, schedules, data, and performance, and the soft side, consisting of a common culture, commitment, trust, and collaboration” (p. 256) . On ownership of the trade-off, they single out “dealing with conflicts and creating the rules for escalated decision making” as particularly important (p. 251) . None of the reviews held here reports a study that tests which escalation rule works better .

Figure 1 S&OP coordination framework categories: share of academic and practitioner articles that discuss each one

Practitioner articles discuss formalization (68%) and socialization (64%) far more often than academic articles (17% and 21%); both concentrate on planning and data management (88% and 96%).



Practitioner articles discuss formalization (68%) and socialization (64%) far more often than academic articles (17% and 21%); both concentrate on planning and data management (88% and 96%).

Source Tuomikangas and Kaipia (2014), International Journal of Production Economics 154, Fig. 4, p. 250, and text pp. 249 and 250: share of articles discussing each of the eight coordination categories of the authors' conceptual framework (Table 1), from which they derive their six S&OP mechanisms (p. 254), 24 academic and 75 practitioner articles on S&OP published 2001 to 2013. Shares of articles, not of companies; an article can discuss several categories.

Figure 1 uses the eight categories of the general coordination framework the authors coded the articles with (Table 1), not the six S&OP mechanisms they derive from them (pp. 249, 254). It shows where the 24 academic and 75 practitioner articles in their review look . Practitioner articles discuss formal processes and meetings (formalization and standardization, 68%) and culture and commitment (socialization, 64%) far more often than academic articles, which concentrate on planning and data management (96%) and on performance measurement and control (71%) (Tuomikangas and Kaipia, 2014, pp. 249, 250)[5] . Informal communication is almost absent from both (4% and 3%) (pp. 249, 250) . Formalization and socialization, which

about two thirds of the practitioner articles discuss, appear in four and five of the 24 academic articles .

How did one company run S&OP while its incentives still pulled apart?

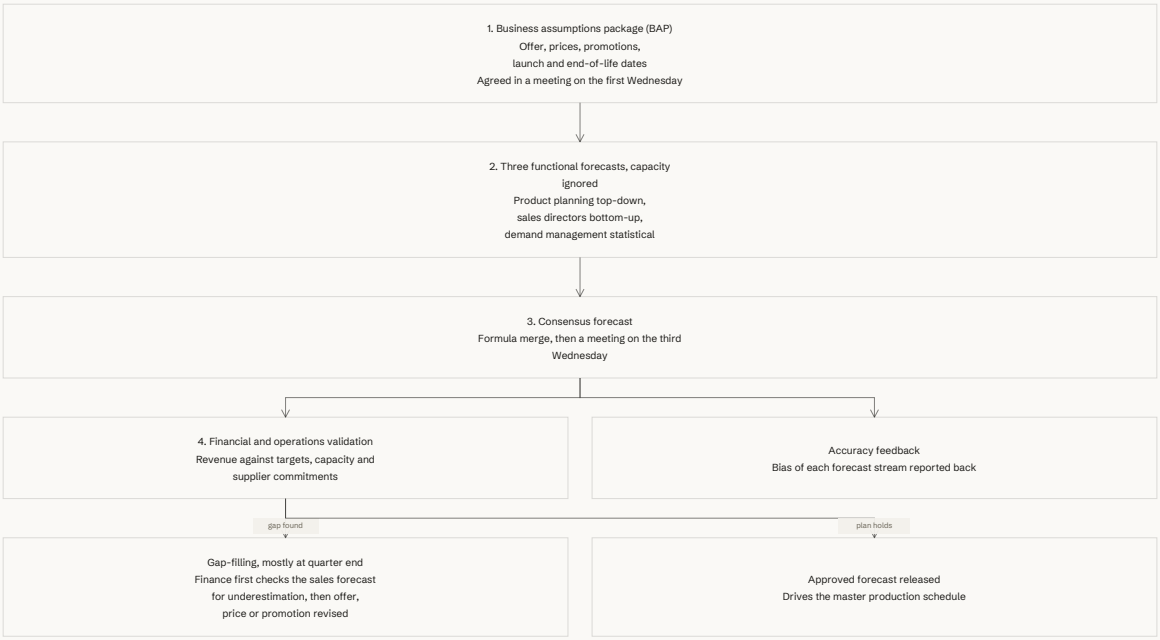
§ 4 of 7

Oliva and Watson (2011)[2] is the study that Tuomikangas and Kaipia (2014, p. 256)[5] single out among the empirical papers for “investigating S&OP in-depth with a process approach from process, organization, data and behavioral dynamic perspectives” . The firm, disguised as Leitax, was a northern California consumer electronics company that sold through retailers and had its products built by contract manufacturers in Asia and Latin America (Oliva and Watson, 2011, p. 436) . The authors conducted 25 semi-structured interviews of 45 to 90 minutes, reviewed archival planning and financial data, and observed two planning and forecasting meetings (p. 437); the design is exploratory and builds grounded theory from a single case (pp. 436, 437) .

Before the redesign, each function planned to its own incentives. The sales force was partly paid through commissions on sell-in, the sales from distribution centers to resellers, while “Operations had part of their compensation based on inventory performance” (p. 439) . An operations manager described the range of planning logics, from finance’s “start with a revenue number and then lets see what kind of products can build to the number” to an operations forecast that “ignored any market information” (p. 439) . In 2001, “poor planning and execution resulted in an inventory charge of roughly 15% of revenue for FY 2001–2002” (p. 439), followed by a new chief executive, several new vice-presidents and a redesign of planning led by the new senior vice-president of global operations (p. 439) . The compensation schemes were not rebuilt: “Throughout this redesign, however, the incentive landscape remained largely unchanged” (p. 439) .

How Leitax ran its monthly S&OP cycle

Figure 2 How Leitax ran its monthly S&OP cycle



Source Diagram from this essay. Sources and interpretation are given in the article.

Figure 2 adapts the process diagram in Oliva and Watson (2011, Fig. 1, p. 440)[2] and their description on pp. 440 and 441 . Each month a forecasting group of the sales directors and the vice-presidents of marketing, product strategy, finance and product management produced a consensus forecast that drove supply, demand and financial planning; “Ownership of the forecasting and planning process was assigned to the demand management organization (DMO)” (p. 440). The cycle started from the business assumptions package (BAP), which held the offer, prices, promotions, and launch and end-of-life dates (p. 440) . Three design choices stand out for a commercial reader:

1 **The demand view stayed unconstrained and plural.** Product planning and strategy built a top-down forecast, the five sales directors a bottom-up one, and the DMO a statistical one that served as the reference point; a formula weighted the sales directors’ forecast more in the near term and product planning’s more for later months (p. 440) .

2 **A revenue gap went first to the sales forecast, then to the offer.** Finance converted the consensus units into revenue and compared it with the financial targets, and operations checked capacity and the suppliers' commitments (pp. 440, 441). If there was a gap, finance "would first ensure that the sales group was not underestimating the product's market potential"; only if the revisions still fell short did the forecasting group "return to the BAP and, together with the marketing department, revise the pricing and promotion strategies to meet financial goals and analyst expectations" (p. 441). Some participants perceived the "pushback from finance during gap-filling exercises" as excessive in some cases (p. 442). The authors describe the validation feedback as changing the offer and promotions plan first and the forecasts only through it, "rather than inappropriately affecting the forecasts directly" (p. 443) . For a revenue leader the lesson is the order: a gap that survived the check of the sales forecast was closed through the offer, the price and the promotion, and the forecast followed .

3 **Approval had a defined consequence.** "The approved forecast was released and used to generate the master production schedule (MPS)." (p. 441) The gap-filling rounds against financial targets "usually occurred at the end of each quarter" (p. 441) .

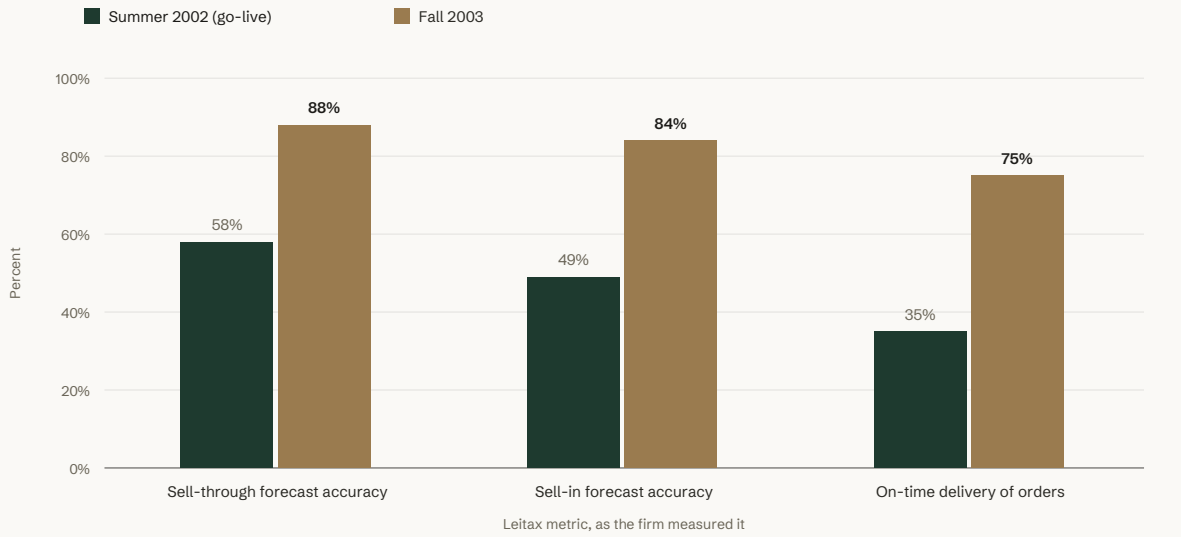
What changed at Leitax, and how far does one case carry?

§ 5 of 7

Oliva and Watson (2011, p. 441)[2] report the operating figures the firm had reached by the fall of 2003 . Forecast accuracy three months ahead, measured by the firm from the absolute error relative to the forecast, was 88% for sell-through (the quantities resellers sold), up from 58% in the summer of 2002, and 84% for sell-in, up from 49%. On-time delivery of orders was 75%, up from 35% . These are not levels from before the redesign. The paper's charts mark the Project Redesign go-live in mid-2002 (Fig. 3, p. 442) and in the firm's Q4'02 (Fig. 2, p. 441), the quarter of the earlier inventory values given below (12 turns, $55 million). Read from the chart, on-time delivery was about 50% in February 2002, fell to about 33% just after the go-live, passed 80% by September 2002 and then moved between about 67% and 89% until November 2003; the 35% the paper reports matches, within reading error, that post-go-live low .

Figure 3 S&OP case evidence at Leitax: forecast accuracy and on-time delivery at the 2002 go-live and in fall 2003

In one consumer electronics firm, forecast accuracy was 88% (sell-through) and 84% (sell-in) in fall 2003 against 58% and 49% in summer 2002, and on-time delivery 75% against 35%. The 2002 values sit at the mid-2002 go-live; one firm, no comparison group.



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Source Oliva and Watson (2011), Journal of Operations Management 29(5), p. 441: forecast accuracy three months ahead for sell-through and for sell-in as the firm measured it (from the absolute error relative to the forecast), summer 2002 against fall 2003, and on-time delivery of orders, 35% against 75%, dated by the paragraph's "By the fall of 2003". The paper's Figs. 2 and 3 (pp. 441, 442) mark the Project Redesign go-live in mid-2002; the 35% matches, within reading error, the delivery low just after it; delivery was about 50% in early 2002 and above 80% by September 2002 (read from Fig. 3). One firm, no comparison group.

The inventory figures moved the same way: inventory turns in the firm's Q4'03 were 26, up from 12 a year earlier; average on-hand inventory was $23 million, down from $55 million; and excess and obsolescence costs were "practically zero in fiscal year 2003 (down from an average of $3 million for fiscal years 2000–2002)" (Oliva and Watson, 2011, p. 441)[2] .

The authors' explanation is about the process, not the forecast. They name process attributes (information quality, procedural quality and

alignment quality) and a social element, constructive engagement: “Active involvement by relevant participants in effectively collecting, validating, and processing information and in voicing and defending their interpretations” (Table 1, p. 438) . The functions did not stop being biased. A senior participant described sales: “Sales always does its forecast high because they don’t pay a penalty if there is too much inventory and they do get a penalty if there is not enough.” (p. 442) From their analysis of the process attributes the authors draw their first proposition: where incentives stay misaligned, changing them is not the only answer, because a process that promotes informational, procedural and alignment quality “can be a mediator in achieving integration” (Proposition I, pp. 443, 444) .

The most instructive detail sits late in the paper. “In fact, the DMO at Leitax had evidence that, for the second half of 2003, the statistical forecast was more accurate than the consensus forecast approved by the group.” (p. 446) That is the comparison a forecast value added audit is built to make. The DMO’s leadership was nevertheless reluctant to streamline the consensus process, because dropping it would remove the occasion on which the functions confronted and validated the forecast and the plan, and because a statistical forecast without a participatory process could meet the same distrust the sales forecasts had met (p. 446) . The authors state the general point as Proposition IV: “The pursuit of alignment in organizational planning can be more important than achieving particular levels of informational or procedural quality.” (p. 446)

How far this carries is limited, and the case’s design and the authors’ own statements say so :

- **One firm, two dates around a go-live.** There is no comparison group; the changes coincided with a new chief executive and new vice-presidents (p. 439); and the authors concede that “unobserved dynamics during the implementation of the changes in the organization could have influenced operational improvement” (p. 435). Their own earlier analysis “did not make clear whether performance and forecast accuracy improved solely because of the improved forecasting methodology, or also because the whole organization was being more effectively managed through a coordinated integration effort” (p. 437).

- **Forecasting and adherence cannot be separated.** “In fact, during our analysis of the forecasting process, we found it difficult to determine whether the current performance in forecast accuracy was the result of the forecasting processes or of better adherence to the agreed plans.” (p. 442)
- **The propositions are not yet tested.** “Finally, determining when our propositions hold remains an open research question, beyond the scope of a single case study.” (p. 446)

What does the research show about S&OP and company performance?

§ 6 of 7

The evidence held here consists of four literature reviews, two of them built on the same 55 papers, and one single-firm case study. The reviews also overlap with each other: three of the 2014 review’s four surveys are among the 2012b review’s four, and the 2022 review shares two authors with the 2012 pair and counts the earlier reviews among its studies (Kreuter et al., 2022, online-first p. 9)[1]. None of the four reviews pools an effect of S&OP on firm performance across studies .

Tavares Thomé et al. (2012a, pp. 2, 3, 11)[3] searched three databases with gray literature included and screened 271 abstracts; 89 papers went to full-text review and 55 were analyzed . On performance, “Among the 55 papers reviewed, just six papers analysed the impact of S&OP on the performance of the firm.” (p. 10) As the synthesis summarizes them, one was a mathematical programming model by Feng and colleagues, three reported positive relations between performance and alignment, collaboration, information systems or integrating roles, one found a mediating role of planning between market uncertainty and results, and one was the Leitax case (p. 10) . “In all cases, the performance of the firm was measured differently, making comparisons and cumulative meta-analysis difficult.” (p. 10) The authors also found that “none of the papers worked directly with metrics aimed at measuring the S&OP process itself” (p. 10) and concluded that “It seems that the literature in S&OP research is not yet ripe for meta-analysis.” (p. 11)

The companion review by the same authors (Tavares Thomé et al.[43], 2012b) set out to measure the size of S&OP’s effect on firm performance, but it is not independent support: it reports the same “271 abstracts and 55 papers” (p. 359) . Its stricter filter kept only survey papers that reported data sources, pretests, content validity, reliability and regression coefficients, which “further reduced the number of

papers down to four" (p. 364) . By the review's own account, two of the four did not report pretests (p. 368), and one, the 2005 paper by McCormack and Lockamy, is a conference paper (Tavares Thomé et al., 2012a, Table 1, p. 3) that Tuomikangas and Kaipia (2014, p. 246)[5] moved to their practitioner category, with a reliability (Cronbach's alpha) of 0.46 for its informal-organization scale (Table II, p. 369) . The four were questionnaire surveys with usable samples of 53 to 128 respondents and response rates of 10.5% to 40.8%, each rating performance on Likert scales and each measuring it differently (Table II, p. 369; p. 371), and "None of the papers reported on statistical power." (p. 368) . As the review tabulates them (Table III, p. 370; the four studies are cited here as reported there), their results point in different directions :

- **McCormack and Lockamy, 2005:** integrating roles, formal groups, informal exchanges and network building were each positively related to managers' self-assessed performance ($p = 0.05$).
- **Olhager and Selldin, 2007:** market uncertainty went with lower performance (-0.383, $p = 0.013$), and the path from the planning approach (S&OP and master scheduling) to performance was 0.258 with $p = 0.117$.
- **Hadaya and Cassivi, 2007:** joint planning showed no significant direct path to flexibility (-0.299, not significant); the positive path ran through interorganizational information systems (0.659, $p < 0.001$).
- **Nakano, 2009:** internal collaborative forecasting and planning went with performance (0.746, $p < 0.05$); collaboration with suppliers and with wholesalers and retailers showed no significant association (-0.174 and -0.009).

The review nonetheless sums up that "Overall, S&OP has a positive effect on performance" (p. 373), adds that the results depend on the industries and countries sampled, and calls for more case studies, surveys and models "before any definitive conclusions about S&OP effects can be generalised" (p. 373) . Read from its own table, the survey evidence of 2012 is four associations of mixed sign and significance, not an effect size .

Tuomikangas and Kaipia (2014, pp. 245 to 248)[5] analyzed 99 papers from 2001 to 2013, of which "75 papers of the 99 were practitioner papers and only 24 were academic" (p. 247) . Modeling and simulation made up 41% of the academic papers, and seven or eight used empirical data, as the review counts them in two places (pp. 248, 256) . The surveys covered between 53 and 128 responding companies or suppliers, and "all the three case studies in this analysis reported a

single case study" (Table 4, p. 249; p. 256) . Their verdict on what research offers practice: "The current academic research offers few guidelines for companies on how to benefit most from S&OP, which is somewhat surprising given the high implementation costs and the high level of expected benefits." (p. 256)

The most recent review held carries the search forward. Kreuter et al. (2022)[1], read in its Online First edition, searched three databases and the Journal of Business Forecasting to January 2019, screened 687 studies and kept 292 (online-first pp. 6, 7) . "Around 79% of the total studies retrieved stem from grey literature" (online-first p. 9), which the authors describe as resting on practitioners' opinions and experience, so that inferences from it "should be drawn with caution" (online-first p. 9) . Academic empirical work has grown: of 61 scientific empirical studies, five of them earlier reviews, 39 appeared from 2014 to 2018, multiple case studies are the most common design (17), and ten surveys have samples above 100 (online-first pp. 9, 20) . Their performance stream lists studies that report a positive effect, several of them optimization models rather than observations (Feng et al. and Nemati et al., as cited there; online-first pp. 20, 22, 26), and it includes Olhager and Selldin, whose path to performance the 2012b review tabulates as not significant. Performance is measured "with different performance measures" (online-first p. 22), in a sample made up mostly of large manufacturers: "Just two studies focus solely on small and medium-sized companies" (online-first p. 22), and only a few cover services (online-first p. 21) . One service study they cite found that more loosely coupled, less formalized processes could suit service companies, which "contradicts findings from manufacturing environments highlighting the importance of formalised processes", Leitax among them (online-first p. 28) . The base is larger than in 2014 and more often multi-case or survey-based, but it still reports directions, from models and from differently measured observations, not an effect size .

One more feature of this evidence base matters. The most encouraging statement in the earlier reviews, that the process matters even when incentives are contradictory, rests on one company. Tavares Thomé et al. (2012a, p. 11)[3] cite Oliva and Watson[2] for their "at least partial evidence that the process in itself might make a difference for the performance of the firm, even when incentives and contracts are contradictory" . Their companion review repeats the "at least partial evidence" in its conclusions, next to the note that Oliva and Watson had "hypothesised" the effect (2012b, p. 375) . Tuomikangas and Kaipia (2014, p. 254)[5] cite the same study for the statement that S&OP as a

collaborative process can enhance integration despite unsupportive incentives . Three reviews, one firm underneath .

Figure 4 S&OP evidence map: what each held source examines and where it stops

Four systematic reviews, two of them on the same 55 papers, and one single-firm case study describe what S&OP is and how one firm ran it; none pools an effect on performance across firms.

Source	Design and sample	What it shows about S&OP	Where it stops
Tavares Thomé et al. (2012a)	Systematic review: 271 abstracts screened, 89 read in full, 55 papers analyzed, gray literature included	Monthly, tactical, cross-functional process at product-family level, horizon from under 3 to over 18 months; inputs led by demand, inventory and production plans, finance clearly named in 6 papers	6 of 55 papers analyzed firm performance, each measuring it differently; not ripe for meta-analysis; counts describe papers, not firms
Tavares Thomé et al. (2012b)	Companion review of the same 55 papers; 4 questionnaire surveys kept for the performance question (53 to 128 respondents)	Tabulates the four surveys' coefficients; mixed sign and significance, summed up by the authors as a positive effect	Not independent of 2012a; no pooled effect size; no survey reported statistical power, two no pretests, one is a conference paper; performance rated by respondents

Source	Design and sample	What it shows about S&OP	Where it stops
Tuomikangas and Kaipia (2014)	Systematic review: 99 papers from 2001 to 2013, 24 academic and 75 practitioner	Six coordination mechanisms, from organization and process to culture and leadership; practitioners stress formalization and socialization, academics planning, data and control	7 or 8 empirical papers among the 24 academic ones; three of its four surveys are among 2012b's four; every case study covers one firm; effect on firm performance named as open
Kreuter et al. (2022)	Systematic review to January 2019 (Online First edition): 292 studies, about 79% gray literature, 61 scientific empirical studies	Three research streams (performance, implementation, context); academic evidence growing since 2014, more multi-case and survey designs	Shares two authors with 2012a and 2012b and counts them among its studies; performance list mixes models and observations; mostly large manufacturers, two studies on SMEs alone, few in services
Oliva and Watson (2011)	Exploratory single case: one consumer electronics firm, 25 interviews, 2 observed meetings, archival data	Monthly validation cycle with unconstrained forecasts; alignment reached while incentives stayed misaligned; accuracy, delivery and inventory performance better in fall 2003 than at the mid-2002 go-live; statistical forecast beat consensus in the second half of 2003	One firm, two dates around a go-live, no comparison group; new management and a new forecasting method at the same time; forecasting and adherence not separable

Four systematic reviews, two of them on the same 55 papers, and one single-firm case study describe what S&OP is and how one firm ran it; none pools an effect on performance across firms.

Source Tavares Thomé, Scavarda, Fernandez, and Scavarda (2012a), pp. 1 to 11, and (2012b), pp. 359 to 375; Tuomikangas and Kaipia (2014), pp. 243 to 257; Kreuter, Scavarda, Thomé, Hellingrath, and Seeling (2022), Online First edition, online-first pp. 6 to 29; Oliva and Watson (2011), pp. 434 to 446. The row selection and the limits column are this guide's reading.

Tuomikangas and Kaipia (2014, p. 256)[5] add a direction the literature has barely started on: S&OP "can be designed as an efficient tool for identifying and closing gaps between the plan and business targets", with marketing actions used to shape demand, but "these views are still in their infancy" . It is the open question closest to a revenue leader's work, and by the authors' account "Conceptual and empirical literature is largely missing" (p. 256) .

How can a commercial leader check the S&OP cycle they sit in?

§ 7 of 7

The worksheet below is this guide's synthesis of the sources and has not been tested . It turns the evidence into four questions a seller, a RevOps lead or a commercial director can put to their own monthly cycle:

1. **Which object is on the table?** An unconstrained demand view, a constrained plan, or the approved plan; Leitax kept the first free of capacity on purpose (Oliva and Watson, 2011, pp. 439, 440)[2] .
2. **Who validates, and against what?** At Leitax, finance tested revenue against targets and operations tested capacity and the suppliers' commitments, as separate steps after the consensus (pp. 440, 441) .
3. **Which lever closes a gap?** At Leitax, when revenue fell short, finance first checked whether sales was underestimating market potential, and the gap was then closed through the offer, price and promotion plan, with the forecast following (pp. 441, 443) .
4. **Is last month's approved plan compared with what happened, and with whether it was followed?** S&OP dashboards in the synthesis compare planned with actual demand, production and inventory and follow forecast accuracy (Tavares Thomé et al.[4], 2012a, p. 10)[3]; at Leitax, accuracy feedback on each forecast stream was part of the meeting (Oliva and Watson, 2011, p. 441) .

Figure 5 An S&OP cycle worksheet for the commercial side of the meeting

One row per plan object: who prepares it, which constraint it is tested against, which lever closes a gap, who approves it, and how it is checked against the actual a month later.

Plan object	Prepared by	Tested against	Gap lever	Approved by	Next month
Demand view, constrained plan or approved plan?	Which function, from which inputs?	Capacity, suppliers, cash or target?	Forecast checked for underestimation first, then offer, price, supply?	Which meeting, and where recorded?	Plan against actual, and followed?

Author's worksheet, untested. One row per plan object; review it with last month's approved plan and its actual.

One row per plan object: who prepares it, which constraint it is tested against, which lever closes a gap, who approves it, and how it is checked against the actual a month later.

Source Author's operational worksheet grounded in Oliva and Watson (2011, pp. 439 to 443 and 446), Tavares Thomé, Scavarda, Fernandez, and Scavarda (2012a, pp. 10 and 11), and Tuomikangas and Kaipia (2014, pp. 251, 254 and 255). The fields are reader inputs; no company data is supplied, and the worksheet has not been tested.

The research cannot yet say how much S&OP adds to a firm's results. What the one in-depth case held here does show is what the meeting is for: its consensus forecast was the less accurate one in the second half of 2003, and the meeting that produced it was still the part the leadership of the demand management group hesitated to give up (Oliva and Watson, 2011, p. 446)[2] . In that case, the output of S&OP was not the best number. It was the number every function would act on .

End of essay

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