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S&OP, Integrated Planning and Supply Chain Excellence

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Agenda

- Part I: The potential and promise of S&OP – research results
- Part II: Where do you stand at Shell?
- Part III: Discussion: Improving S&OP at Shell

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Some research results: My Chain Delivers

"My Chain Delivers" analyzed more than 100 factors/practices along the supply chain and their contribution to SC performance and company success

MyChainDelivers

- More than 100 companies surveyed
- 12 different sectors
- Regional mid-sized companies to global corporations
- Different supply chain structures
- More than 100 success factors for SCM analyzed

+

Case studies, expert-interviews, lots of anecdotal evidence

Joint work with McKinsey & Company

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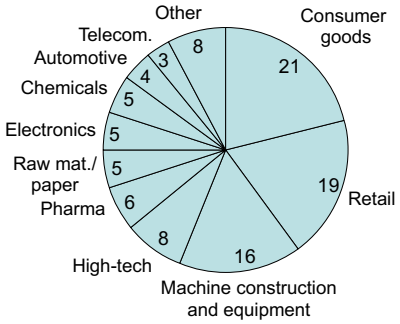
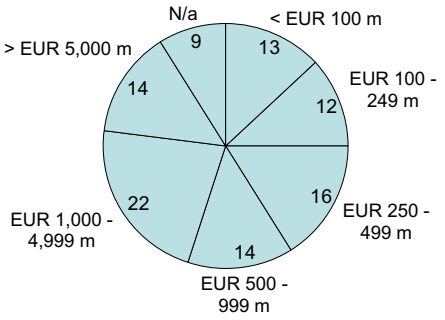
Sample

Industries
Percent



Revenues
Percent



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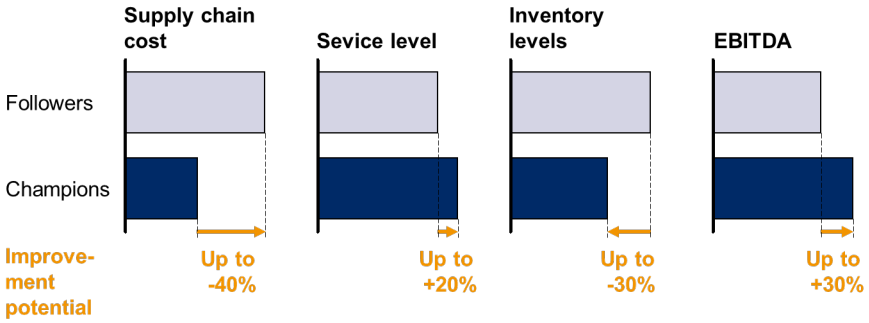
Compared with their followers, the champions show better performance in every dimension

Supply chain performance

KPIs

Company performance



Which factors/practices explain these differences?

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Method Overview

Expert interviews + literature review

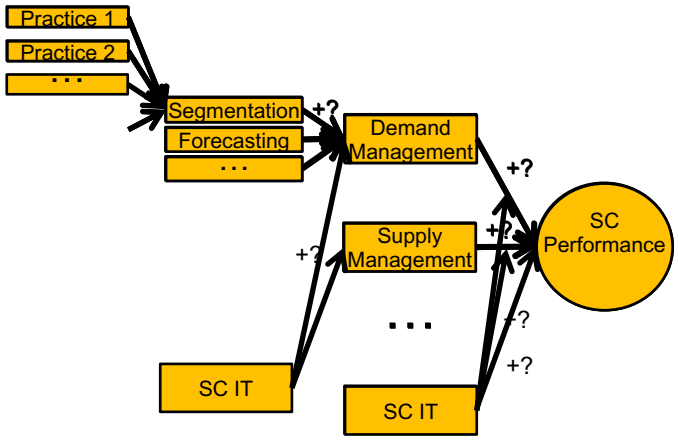
Build categories

Develop constructs and scales

Develop questionnaire

Pre-test

Survey



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Key results

What drives performance?

- Segmentation
- Process Management
- Process Integration
- SC Strategy and Alignment

Common themes:

Excellent supply chains are segmented and integrated, with well defined processes, aligned KPIs and a supporting strategy and organization

Trivial, isn't it?

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High-level results with respect to S&OP

- How we measured S&OP implementation
  - Fully implemented S&OP process
  - Decision makers participate in S&OP meetings
  - Organization follows S&OP process/plan
- Further case analyses and interviews
- Results in a nutshell:
  - Many companies are trying (have tried), but only few succeed(ed)
  - Oftentimes process was implemented but not executed, i.e. back to business as usual

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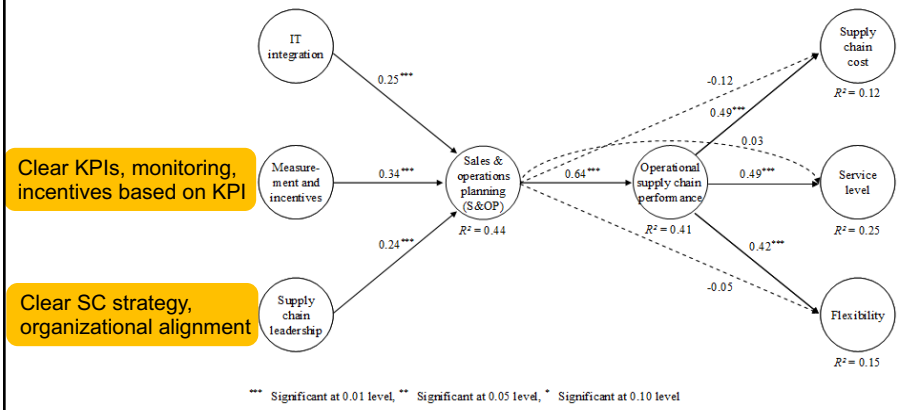
Results: S&OP impact and success factors

Our research shows what makes S&OP effective and also, how S&OP impacts supply chain performance.



Clear KPIs, monitoring, incentives based on KPI

Clear SC strategy, organizational alignment

(Pibernik & Rexhausen, 2012)

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Findings

Based on our sample of 100 firms and numerous interviews and case analyses, we find:

- Those companies who report full and successful implementation, enjoy substantial performance improvements
- However, many companies report that S&OP has not been successful
- Our results suggest that organizational design is decisive and can, to a large extent, explain the difference between success and failure
  - Organizational alignment
  - Incentives

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Key Questions for S&OP

- What is the right organizational set-up for successful IBP/S&OP ?
  - What needs to be changed compared to “traditional” set-up?
  - Who is responsible, who participates?
- What are the right incentive systems for IBP/S&OP?
  - How do incentive systems have to be changed compared to traditional way?
  - Is it feasible? Which obstacles do we face?
- What are the organizational success factors during implementation?
  - What is the right “change management approach”?
  - Who leads and makes it happen?

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Some simple questions…

1. Do you have a single forecast that all SC actors (sales, production, logistics, purchasing, finance,…) believe in and plan towards?
2. Are there clear responsibilities for forecast performance and incentives to produce good forecasts?
3. Do SC actors understand the concept of a service level?
4. Are you confident that in your company service level targets are set right and worked towards?
5. Is there a common, compact, and comprehensible set of KPIs that measure how effective supply chain management is and does a corresponding set of target values exist?
6. Do different actors (esp. sales, logistics, production, purchasing) coordinate regularly to align plans and to meet these targets?
7. Are incentives in your organization set in such a way that all actors work towards achieving these targets?
8. Do you (and the other SC actors) know the costs and benefits of
   a) Reducing the (supply, production, customer) lead time by ½
   b) Reducing the production lot size or replenishment order size by ½?
   c) Does anybody care?
9. Is updated demand information distributed across all supply chain functions and incorporated in plans that are updated on a regular basis?
10. Do all SC actors know the "real" landed costs of your products and true profits?

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Backup slides for discussion

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A Simple Example – The CFO's Dilemma

- Consider company "ALPHA" with a healthy gross margin, approx. 10,000 SKUs, long lead times and volatile seasonal demand
- CFO says: "somehow my numbers never work out", why did we spend all that money on fancy SAP software?
- These are her/his numbers for 2014:

	Cost	Price	Margin	Forecast	Planned Gross Margin
SKU 1	3	6	3	2000	6000
SKU 2	5	8	3	6000	18000
SKU 3	2	4	2	2500	5000
...	...	...	...	...	...
SKU 10000	4	7	3	3000	9000
			Total Gross Margin		95.000.000,00 €
			Overhead (40%)		54.200.000,00 €
			Profit		40.800.000,00 €
			ROS		30%

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A Simple Example – The CFO's Dilemma

However, this is what really happened (EOY 2014):

(Assumption: order quantity = forecast quantity)

	Cost	Price	Margin	Forecast	Planned Gross Margin	True Demand	Sales volume	Actual Gross Margin	Comment
SKU 1	3	6	3	2000	6000	1200	1200	3600	Over-forcasted
SKU 2	5	8	3	6000	18000	6000	2000	6000	Supply shortage
SKU 3	2	4	2	2500	5000	5000	2500	5000	Under-forecasted
...	...	...	...	...	...	...	...	...	
SKU 10000	4	7	3	3000	9000	3000	3000	9000	"Lucky Shot"
			Total Gross Margin		95.000.000,00 €			59.000.000,00 €	
			Overhead (40%)		54.200.000,00 €			54.200.000,00 €	Revenue: 135.5
			Profit		40.800.000,00 €			4.800.000,00 €	
			ROS		30%			4%	

- **Why does this happen?**
- **What can we do about this? What do you think the typical reaction of management will be?**

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Demand-Supply Mismatch at ALPHA

Excessive inventory (obsolescence) **and** frequent stock-outs (low service level) **at the same time**
Company has sufficient supply chain planning expertise and the right tools.
What went wrong? Here are some issues:

- Forecast was not a forecast (but some break down of financial plan)
- No linkage between financial planning and "real" sales, inventory, etc.
- No forecast alignment (e.g., commercial has different forecast than supply side)
- Some "out of the blue" service level targets, no common definition, too low for sales, unrealistic for supply side…blame game…
- Poor incentives
  - No real responsibility for forecast accuracy
  - No responsibility for SLOBS, incentives to delay sell off, to postpone write-off, etc.
  - Production: counterproductive make vs buy decisions
  - Purchasing: incentives for high minimum order quantities and long lead times
  - Marketing: many NPI, SKU proliferation, no assessment of true profitability
- Disconnect between plan and decisions; mainly fire fighting
- Nobody had responsibility for making profit with a product

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What we did at ALPHA

- Some improvements in forecasting and planning (but not drastic)
- One agreed upon forecast (finance, sales, supply side), understanding that this is the best set of numbers
- Service level definition: differentiated targets, understood by sales and supply side, signed off.
- Joint decision making for NPI and phase-out (marketing, sales, finance supply side)
  - New products: early risk assessment, early involvement of supply side, ensure "manageability" of product
  - Phase out: similar, risk assessment, early sell-off activities, "cut the losses"…
- Simple KPIs and objectives: product profitability; reach sales target and service level target at zero obsolescence
- Responsibility & organizational change:
  - Integrated planning team (heads of marketing, sales and supply) are jointly responsible for achieving objectives; jointly report to CFO, incentives aligned accordingly
  - Yearly detailed product assessment with respect to KPIs and targets, root cause analysis, organizational learning, separate bad luck from bad planning, no blame game!
- Most important: change of spirit – "We will JOINTLY fight to make each product a success"

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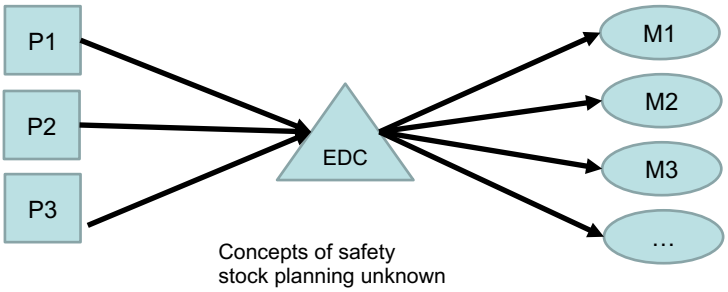
Another Example: BETA - Worst Practice Pharma SC

- 2013 European Production & Distribution System of well-known pharma company
- Company spent significant amount of money for SC IT, and as much for a "journey" with a well-known consultant
- However: huge obsolescence, inordinate amount of money spent on emergency shipments, and still: frequent stock-outs



Lead time uncertainty
No alignment with demand
"production driven"

Concepts of safety stock planning unknown
Unclear replenishment logic
Firefighting

Lumpy demand, bad forecasts
Unpredictable order patterns
Gaming, order changes

How do you resolve this?

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Third Example: Successful S&OP at Vestel (Taskin et al., 2015)

- Vestel: large Turkish manfucturer of household appliances, consumer electronics, defense products, revenue: $4.2 billion
- Flagship company: Vestel Electronics; largest European TV manufacturer; mainly contract manufacturing, export to 140 countries
- Single manufacturing site ("Vestel City") located in Manisa, Turkey, one of the largest industrial complexes 1,1 million sqm, annual production capacity of 15 million products

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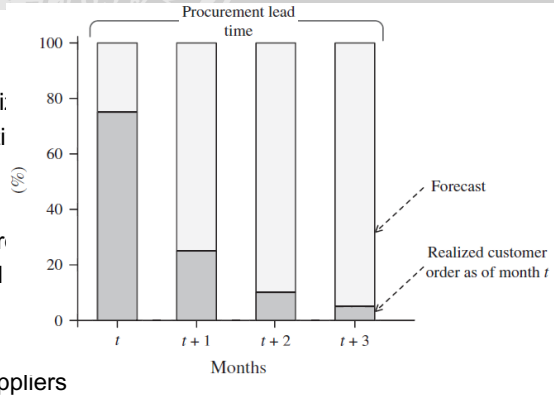
Supply Chain Challenges at Vestel

- Demand side:
  - Make-to-order, mass customi
  - Volatile demand, price sensiti
  - Short life cycles
  - 5000 new products annually
  - 37% of its production is for or
  - Average customer order lead period
- Supply side:
  - >20.000 SKUs from 500+ suppliers
  - Most suppliers located in Asia
  - Limited BOM-flexibility due to customer requirements
  - Average material procurement lead time: 90 days



How can Vestel efficiently align supply with demand?

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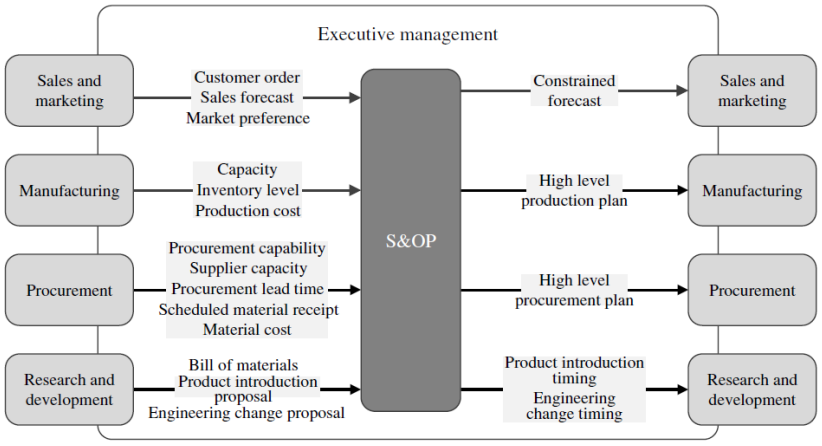
S&OP at Vestel

- Executive management responsible for generating consensus plan with S&OP planners and individual functions



Taskin et al., 2015

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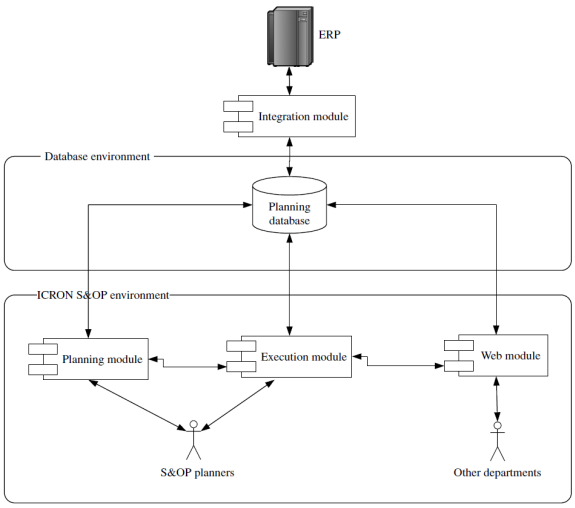
Single DSS is basis for S&OP at Vestel



Taskin et al., 2015

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Mathematical Model for S&OP at Vestel

$$\text{Minimize} \quad \sum_{i\in I}\sum_{j\in J_i}\sum_{t\in T} c_{ijt}x_{ijt} \tag{1}$$

$$\text{subject to} \quad \sum_{i\in I_f}\sum_{j\in J_i} x_{ijt} = q_{ft} \quad \forall t\in T,\ f\in F_t, \tag{2}$$

$$\sum_{j\in J_i} x_{ijt} \geq o_{it} \quad \forall t\in T,\ i\in I, \tag{3}$$

$$\sum_{i\in I}\sum_{j\in J_i} u_{ijr}x_{ijt} \leq v_r \quad \forall t\in T,\ r\in R, \tag{4}$$

$$y_{i(t-1)} + r_{it} + \sum_{j\in J_i} x_{ijt} - \sum_{i'\in I}\sum_{j\in J_{i'}} b_{i'ji}x_{i'jt} = y_{it} \quad \forall t\in T,\ i\in I, \tag{5}$$

$$\sum_{(i,j)\in U_{ct}} x_{ijt}\odot d_{ct} \quad \forall t\in T,\ c\in C_t, \tag{6}$$

$$0\leq x_{ijt}\leq \bar{x}_{ijt} \quad \forall t\in T,\ i\in I,\ j\in J_i, \tag{7}$$

$$0\leq y_{it}\leq \bar{y}_{it} \quad \forall t\in T,\ i\in I. \tag{8}$$

Taskin et al., 2015

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S&OP at Vestel - Questions

Vestel was very successful with their new S&OP process. The solution seems straightforward and intuitive.

- Where do you see the challenges in applying this to other supply chains?
- What are key prerequisites?
- What are the main obstacles?

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Key results & Interpretation

- Segmentation does not mean fragmentation
  - Segmentation only where it adds customer value or helps to better match supply and demand
  - Split supply chain into un-segmented (efficient) part and segmented part. Un-segmented part is tailored to achieve economies of scale
- Integrated processes/integrated planning
  - Not functional optimization but cross-functional optimization
  - Move from functional planning (sales, distribution, production,…) to integrated planning logic that aims at “best” match between demand and supply
  - Often termed (but often not liked) “S&OP“

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Key results & Interpretation

- Process Management
  - Well-defined processes and KPIs that measure performance (sounds trivial…) that are aligned with integrated process, i.e., not traditional functional KPIs
  - Monitoring and clear accountability (which is complicated because of cross-functional approach)

- Strategy & Alignment
  - Integration is not a lip service…
  - Organizational change management from functional to integrated cross-functional (very often only works for burning platform)
  - Stop the “blame game” and avoidance of accountability (“someone else’s fault”)
  - Right organizational structure to support integrated planning and to live up to joint objectives (KPIs)

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