

# Roland Berger

## Focus

February 2018

### Supply Chain Planning 4.0

Supercharge your supply chain planning performance



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# Management summary

## Today's companies need a lean, responsive, digitized supply chain planning setup. Welcome to SCP 4.0.

In a fast-paced and dynamic world, change is the only constant. Manufacturing companies that control their own production must ensure that their supply chain planning (SCP) systems are flexible enough to navigate the complexities that this changing world presents, particularly in the age of digitization. Unfortunately, many firms use outdated supply chain planning practices that reduce their operational efficiency and damage their financial performance. Manufacturers can prepare for these challenges – and even profit from a rapidly changing business environment – by implementing a contemporary and future-ready supply chain planning setup. In a word, SCP 4.0.

SCP 4.0 envisions a lean, responsive and digitized setup that fosters data-driven business decisions. It hinges on an agile organization backed by an interconnected system landscape, providing accurate source-to-shelf visibility in real time. This is assisted by advanced analytics tools that aid more accurate forecasting and more effective scenario visualization, ensuring rapid, effective and informed decision-making.

In this study, we first present the results of an extensive survey carried out among supply chain and operations professionals. This looked at the readiness of the supply chain planning setup across the globe. What state is it in, and where do the chief pain points lie?

Next, in a special feature, we examine some of the latest trends seen in supply chain planning. We identify four key tendencies: the integration of previously separate planning horizons, the appointment by companies of a "collaborative planner" to oversee the interconnected supply chains of their suppliers and of the company itself, the application of advanced scenario planning tools, and the use of data analytics to forecast demand better.

Based on our experience working with companies, we then present a practical, three-phase approach for supercharging your supply chain planning performance. The three phases are: analyze your current position, shape a vision of the future (including the target processes, organizational setup and systems), then implement this new vision.

Finally, we look at the investments required to transform supply chain planning systems, and the tangible and intangible benefits. Generally, we expect to see a payback period of two to four years, with an internal rate of return of 15 to 25 percent. Intangible benefits include improved employee satisfaction, greater capacity utilization, better process control and adherence, and increased supply chain agility. Implementing SCP 4.0 is a lengthy process – but ultimately a rewarding one.

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Do the benefits of implementing SCP 4.0 outweigh the costs?

# Firms know where their future weaknesses lie

Our survey highlights the key pain points.

Simply put, the purpose of supply chain planning is to accurately estimate the needs of customers and ensure that they receive the right product, through the right channel, in the right quantity and at the right time. In an ideal situation, this would result in 100 percent forecast accuracy, zero stock-outs and, of course, a highly efficient and responsive supply setup.

In an earlier Roland Berger publication – *The Supply Chain Excellence Study 2015* – we identified a number of factors that are challenging supply cycles in today's business environment. Those factors include globalization, the trend toward customization, political and economic uncertainty, disruptive business models, and innovative technology such as artificial intelligence, augmented reality, 3D printing, robotics and the Internet of Things. All of these factors call for agility, responsiveness and adaptability on the part of companies. In addition, increasing customer requirements and rapidly shifting tastes are driving complexity, volatility and uncertainty, putting supply chains under severe stress.

Our 2017 survey, carried out for the purpose of the present study, takes a deeper look at the readiness of the supply chain planning setup across the globe. We surveyed more than 200 supply chain and operations executives. Over half of their companies were headquartered in Europe, a quarter in North America and the remainder in the Middle East and Africa. The biggest group consisted of consumer goods and retail companies, with the construction and utilities industries and healthcare and medical sectors also forming significant groups. A slight majority of the companies had revenues in excess of EUR 1 billion in 2016, and over 80 percent had more than 1,000 employees. → [A](#)

Two-thirds of our respondents believed that their companies' supply chain strategies were effective, and over half

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**"We use multiple planning systems that are not integrated with each other and do not talk to each other. That weighs down the planning process and makes it difficult to adjust plans when necessary"**

said that they were well executed. Three out of four stated that they met current business requirements. But when we asked them whether those supply chain strategies were suitable for future business requirements, the respondents were split fifty-fifty. In other words at least half, by their own admission, will need to adapt their supply chain strategy. It is here that SCP 4.0 can play a key role. → [B](#) [C](#) [E](#)

To add detail to the picture, we asked respondents about specific elements of their supply chain planning system. Demand planning was the area most commonly identified as requiring the most improvement in terms of performance. The demand planning process typically takes place on a local level to ensure proximity to the markets. But this leads to variations, complexity and sub-par demand forecasting. What companies really need is a scalable and adaptable planning philosophy, coupled with a high degree of process and organization maturity. This will ensure consistent application of the standard.

Sales and operations planning (S&OP) represents the bridge between demand and supply domains. It acts as the fulcrum of a good supply chain process and is impacted in large part by the quality of the demand planning. According to our survey, S&OP is less of a problem area than demand planning: Two-thirds of the respondents said that it was performing well, and around the same number said that the process was highly standard-

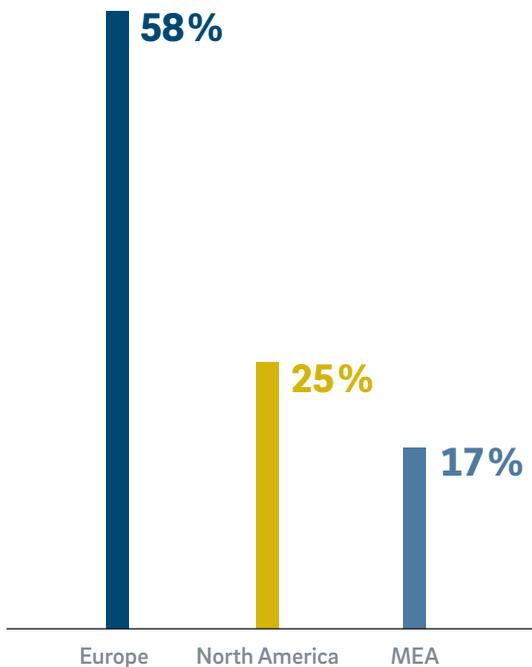
ized within their company. But despite this relatively high level of satisfaction, S&OP remains a focus area for the near term.

Compared to demand planning and S&OP, production planning is generally more standardized across organizations and performs relatively well. This is the result of continuous improvement efforts that have been made

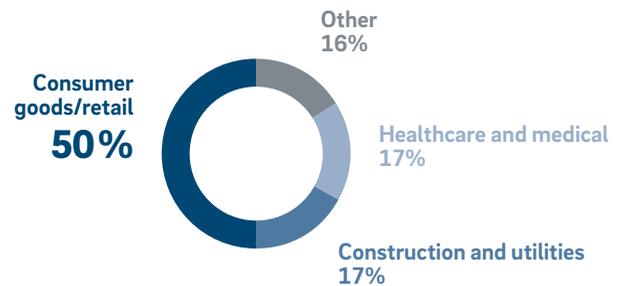
**A: Methodology.**

More than 200 global supply chain and operations executives surveyed.

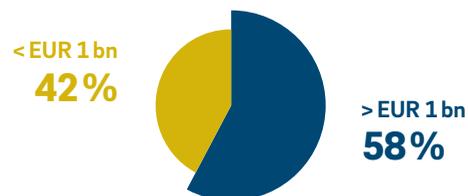
**Location**



**Industry**



**Revenues [2016]**



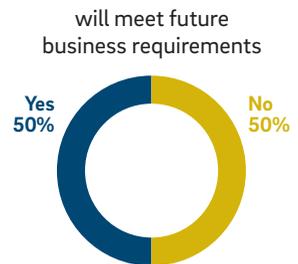
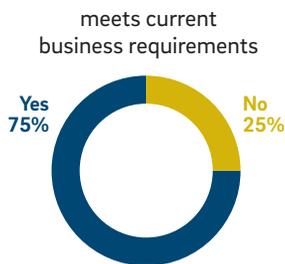
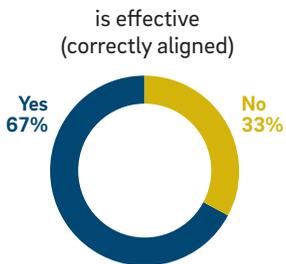
within companies. Nevertheless, with the arrival of Industry 4.0, production planning is an area that is also back in focus as a way to boost efficiency.

The survey found that companies need to update their current supply chain planning IT systems in line with the significantly changed business environment of today. Most of the companies surveyed last transformed their

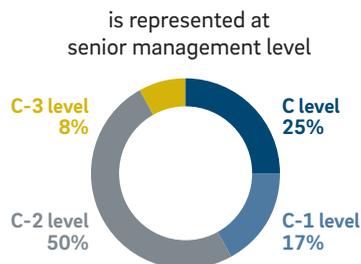
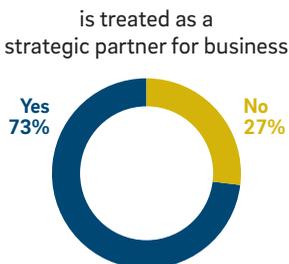
enterprise resource planning (ERP) some time in the previous decade. By and large, they purchased on-premise solutions from vendors such as SAP, involving major investment and a high degree of customization. While this created an IT setup that was robust enough to meet the needs of the time, it also by design embedded rigidity, which made it difficult to adapt the systems for constantly changing business needs. The result has been that, as

**B: Supply chain performance and positioning snapshot.**  
Share of responses in survey.

**Our supply chain strategy ...**

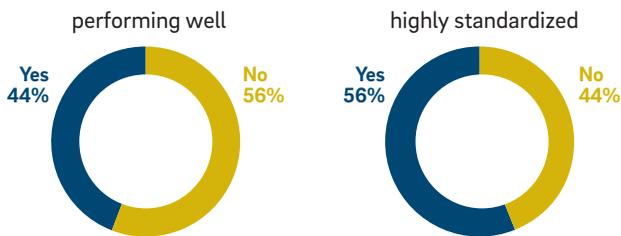


**The supply chain function ...**

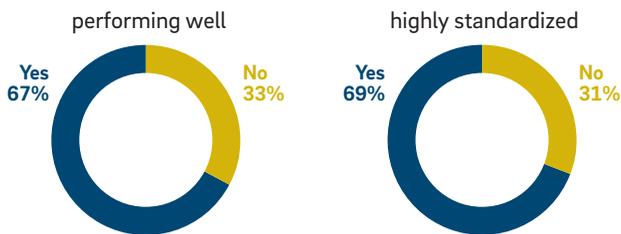


**C: Standardization drives supply chain performance.**  
 Planning performance vs. degree of process standardization.

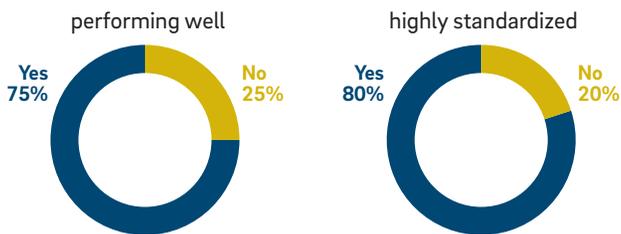
**Demand planning is ...**



**S&OP is ...**



**Production planning is ...**



new technologies have emerged over the years enabled by digital breakthroughs, the level of digitization has remained rather low across the board.

However, supply chain executives across different industries and geographical locations are well aware of the benefits of digitization. They are particularly convinced of its positive impact in areas such as reducing stock-outs (77 percent of respondents agree), reducing the number of short-term planning changes (68 percent), reducing lead times (67 percent) and increasing forecasting accuracy (58 percent). Digitization is an area that will see significant investment in the coming years.

The survey results, backed up by our experience supporting companies engaged in transformation, indicate that a business-as-usual approach to supply chain planning leads to operational inefficiencies. Companies can suffer from poor forecasting accuracy, long lead times, and numerous short-term planning (STP) changes. These in turn reduce productivity and increase overtime and slow-moving and obsolete inventory (SLOB). Outdated practices are responsible for bunching and gaps in the supply chain, too, with large inventories in certain areas and stock-outs in others. Ultimately these operational inefficiencies impair overall financial performance and translate to high working capital, higher logistics costs and lower revenues.

In the face of these multiple challenges, companies need not just incremental changes but a radical realignment toward SCP 4.0. This entails an integrated approach encompassing a transformational vision, lean processes, an agile organization and an interconnected digital system landscape. In the following section, we present a three-phase approach to achieving this vital transformation.

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# The latest trends in supply chain planning

When defining a vision for their future supply chain planning, companies need to be constantly aware of the latest developments in the field. We outline four trends currently shaping the supply chain planning landscape. This can serve as input for the work that companies have before them.

## 1. SEAMLESS TIME HORIZONS

A major new supply chain planning trend is the merging of time horizons for planning. This is a shift away from the old-fashioned "silo planning" approach, where companies had different planning teams for long-term, mid-term and short-term planning. Integrating the different planning horizons means combining input from various functions into a single planning solution, encompassing demand planning, S&OP, finance and scheduling. The company can then easily zoom in and out from a more detailed short-term plan to a less detailed longer-term plan.

This new approach creates a shared "source of truth" and establishes a link between long-term strategic planning, mid-term financial planning and day-to-day operational planning. Other benefits include more robust supply chain planning, less variance across stakeholders, and greater transparency. Together, this can boost all-round operational and financial performance.

## 2. COLLABORATIVE PLANNING

Collaborative planning involves appointing a "collaborative planner" or "network planner" – an individual with responsibility for overseeing the interconnected supply chains of the company's suppliers and the company itself. This provides an end-to-end view of the supply chain, making it possible for companies to respond accurately to customer demands and improve capacity utilization.

## 3. ADVANCED SCENARIO PLANNING TOOLS

This trend involves innovative planning processes that use advanced scenario planning capabilities. Within these processes, planners use an "optimizer" – an advanced algorithm that calculates the best way to balance demand and supply, rather than concentrating solely on feasible scenarios. The optimal scenario is based upon up-to-date supply chain data and production capacity constraints, which are fed into the planning system. An optimizer of this type facilitates agile and responsive planning, which in turn improves capacity utilization and minimizes inventories.

## 4. USE OF DATA ANALYTICS TO FORECAST DEMAND BETTER

An increasing number of companies are turning to "demand sensing", a short-term forecasting analytics method that combines historical internal transactional data with external data (for example, from weather and marketing reports) to predict demand in the near future. Demand sensing provides a more accurate forecast of baseline demand. It also reduces the number of short-term planning changes and results in lower operational waste and inventories. Ultimately, this increases customer satisfaction and company performance.

# A recipe for success

Our three-phase approach to supercharging supply chain planning.

At Roland Berger we have developed a practical three-phase approach to achieving SCP 4.0. Phase 1 involves analyzing a company's current supply chain planning and identifying its key pain points. Phase 2 is all about shaping a vision for the company's future supply chain planning process, organization and systems. Phase 3 covers the implementation and related steps.

Achieving SCP 4.0 is a slow process. In our experience, companies should reckon on 15 to 30 months or even longer for the entire process, depending on the maturity of their current supply chain planning. → [D](#)

### **PHASE 1 – ANALYZE THE CURRENT SETUP**

In the first phase, the company benchmarks its supply chain planning against its peers. For the peer group we can use the set of almost 200 companies that participated in our survey. By comparing the company's performance to others, we can establish the maturity of its supply chain planning and determine how well prepared it is for digitization.

We back up the benchmarking exercise with a quantitative analysis of relevant key performance indicators (KPIs) across markets and business units. We can also carry out qualitative assessments by interviewing internal experts in different parts of the company, asking them to rate the maturity of the supply chain planning from one to five across the different planning phases. This allows us to identify pain points.

To understand how the supply chain planning functions in practice and to ascertain the degree of standardization, we carry out a comprehensive process mapping exercise. In workshops with internal stakeholders, the supply chain planning processes are charted end-to-end – from demand to factory – identifying pain points at the process, organization and system levels.

We can cluster typical pain points according to whether they relate to processes, organization or systems. In the area of processes, for example, supply chain planning processes may not be standardized across the organization, processes may be manual or repetitive, decision-making in S&OP may be ineffective, and supply chain planning KPIs may be inappropriate or even non-existent. In the area of organization, the strategic position of the supply chain may be unclear. Is it, for example, geared toward fulfillment or does it see itself as a strategic business partner? The supply chain may be ineffectively embedded within the organization, planning may be spread between different functions such as finance, sales and operations, and supply chain planning staff may lack clearly defined career paths. In the area of systems, typical problems include obsolete systems designed for a pre-Internet age, gaps in functionalities, dated interfaces, slow processes and competing system environments.

### **PHASE 2 – SHAPE A VISION FOR THE FUTURE**

Having identified their pain points, companies have two options. They can systematically address the issues, closing gaps where necessary by making incremental improvements. Or they can define a bold new vision for their supply chain planning, transforming it in line with SCP 4.0. The latter choice often involves a quantum leap in terms of performance.

Our work with companies shows us that this second approach is the more effective one. Companies need a best-in-class, digital, optimized and interconnected supply chain planning landscape. That means providing planners with an end-to-end view, from suppliers to points-of-sale. It means building an agile supply chain planning organization that can deal with uncertainty and volatility. And it means enhancing customer focus through Big Data and advanced analytics.

Digitization is the key enabler. It draws on three levers: integration, automation and analytics. These levers are the source of innovative applications in the supply chain, such as demand sensing, automated capacity leveling or balancing, real-time tracking and automated production scheduling. → **F**

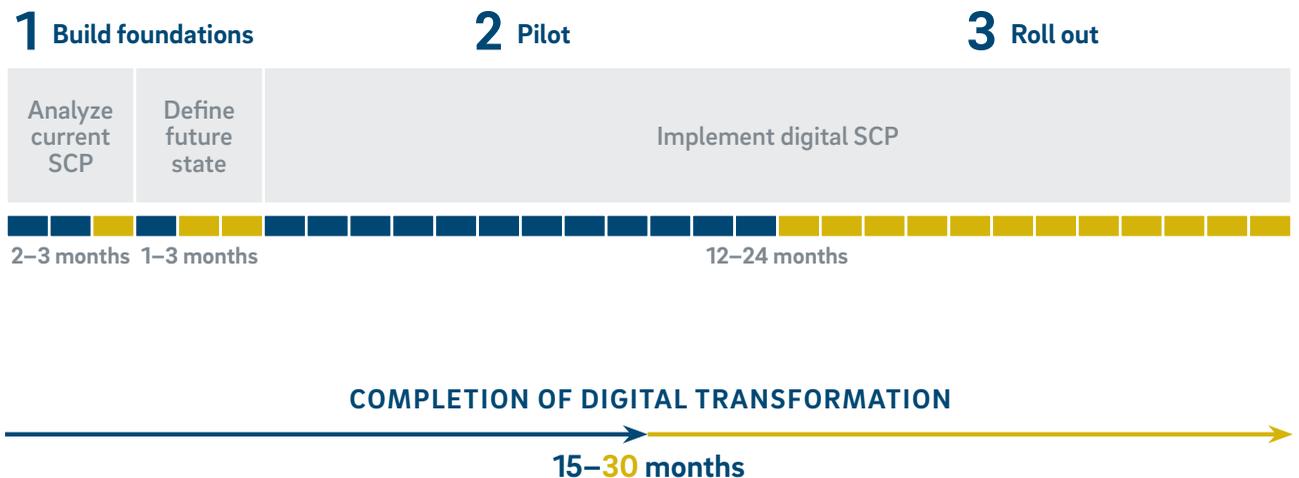
**Future processes**

Having defined its vision, the company must now detail its new processes, organization and systems. The initial mapping of the supply chain planning process in Phase 1 will have revealed a number of areas where the company can improve its performance and elimi-

nate efficiencies. It now needs to design future supply chain planning processes that are effective and promote adherence by design.

A number of factors are key here. The company must introduce clear process gates (defining inputs/outputs and deadlines) and workflow support. It must align timeframes and levels of detail between mid-term and short-term planning. It must standardize processes across regions, eliminating any unnecessary planning steps. It must strive to avoid repetitions by consolidating decision-making events. And in parallel, it must maximize automation.

**D: Speedy implementation provides quick payback.**  
A roadmap for digital transformation.



The company should underpin these efforts with a new RACI (responsible, accountable, consulted, informed) matrix that maps responsibilities along the process flow, ensuring adherence to the newly defined process. To balance demand and supply, it should introduce an empowered monthly S&OP meeting or strengthen the existing S&OP meeting so that it becomes the single decision-making body, bringing together stakeholders such as the supply chain planning team, finance, sales and the factories.

KPIs for the new process need to be realigned and clearly linked to incentives in order to enable effective steering of supply chain planning. Additionally, the company should establish a controlling cycle that can take action wherever deviation from KPIs occurs. To ensure high standards of process performance, the KPIs should regularly monitor forecasting accuracy, plan adherence (production reliability), process adherence, operational costs (days of inventory, SLOB) and sales (stock-outs, time-to-market).

Data is the foundation of SCP 4.0. Traditionally, master data management (MDM) has been seen as an IT topic. However, we believe that master data is a key pillar supporting the process. Indeed, all the improvements aspired to hinge on the availability of adequate, error-free master data. Before being stored in an IT system, the relevant data for the supply chain is entered by various stakeholders, for example in sales, finance, marketing and production. In the SCP 4.0 world, companies need a robust data entry and management process, and clear guidelines governing the handling and supervision of data.

#### **Future organizational setup**

Two things are essential for efficient supply chain planning: the correct strategic positioning of supply chain

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**The supply chain function is increasingly considered a strategic partner for business across companies.**  
**Current systems have not kept pace with the requirements of modern supply chains.**

planning, and a homogeneous supply chain planning organization across regions. The company needs to elevate its supply chain planning function to the strategic level. Given the current volatility, uncertainty, complexity and ambiguity, supply chain planning should be regarded as a strategic business partner and not simply as an operational function. Our survey results bear this out: Three-quarters of respondents said that the supply chain function is considered a strategic partner for business within their company, and in more than 40 percent of cases it is represented at the top management level (C or C-1).

The degree of centralization or decentralization of supply chain planning activities is an important factor in the standardized execution of the process across the company. A highly standardized supply chain planning organization across countries and markets significantly improves decision-making. Possible options are a supply chain planning organization that includes the demand planning function, or an organization where demand planning is owned by finance or sales and works in close collaboration with the broader supply chain planning organization. The optimal configuration for a company will depend on the market requirements and the conditions for business: The company needs to assess these factors for each function and activity. We recommend including local input for demand planning with centralized overall coordination at a strategic level to ensure adequate market proximity and consistency with the overall strategic direction.

The job of a planner is often a repetitive one, and staff turnover can be high. As a result, knowledge and planning experience is frequently lost. When junior or inexperienced planners take over, more planning errors occur, weakening the operational performance of the supply chain planning. Companies should therefore develop career paths for planners, enriching junior em-

ployees' job profiles and increasing their responsibilities, partly by centralizing planning functions. Jobs should be refocused on validating and confirming input rather than simply entering transactional data and carrying out computations.

Finally, companies must fix any master data issues they have at the process level (as described above) and the organizational level. To ensure process adherence in entering master data – from demand planning to factory capacity data – the company should put in place a master data governance system and a related RACI matrix.

#### **Future systems**

When defining their future system landscape, companies must make sure that they involve all stakeholder groups – markets, manufacturing operations, the supply chain and IT. This will ensure a holistic view of the future functionality that needs to be supported by the systems. For instance, demand planners want the demand-sensing capability to enhance the forecast accuracy, while factory planners want real-time data on production line availability and capability. The company should draw up a long list of use cases, prioritize them, and then select those ideas that deliver the greatest financial and strategic impact.

In our experience, the key use cases are demand sensing and planning, demand consolidation, scenario management and capacity leveling, constrained capacity visibility and production scheduling. These are the first modules that the company should implement. They need to be integrated into a comprehensive future systems landscape, detailing the data and process flow and the intended modules. → [G](#)

We said above that three levers exist for digitization: integration, automation and analytics. End-to-end inte-

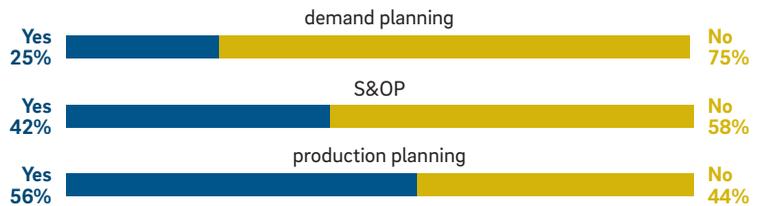
**E: SCP IT – in dire need of supercharging.**  
Share of responses.

**The current SCP IT system landscape ...**

adequately and effectively supports SCP requirements



has a high level of digitization of ...

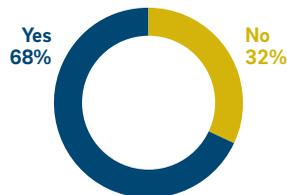


**The digitization of SCP has a strong impact on ...**

increasing forecasting accuracy



reducing the number of short-term planning changes



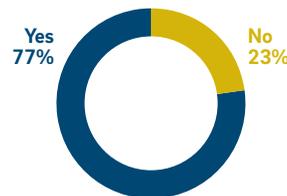
reducing inventory levels



increasing lead times



reducing stock-outs



reducing slow-moving and obsolete inventory

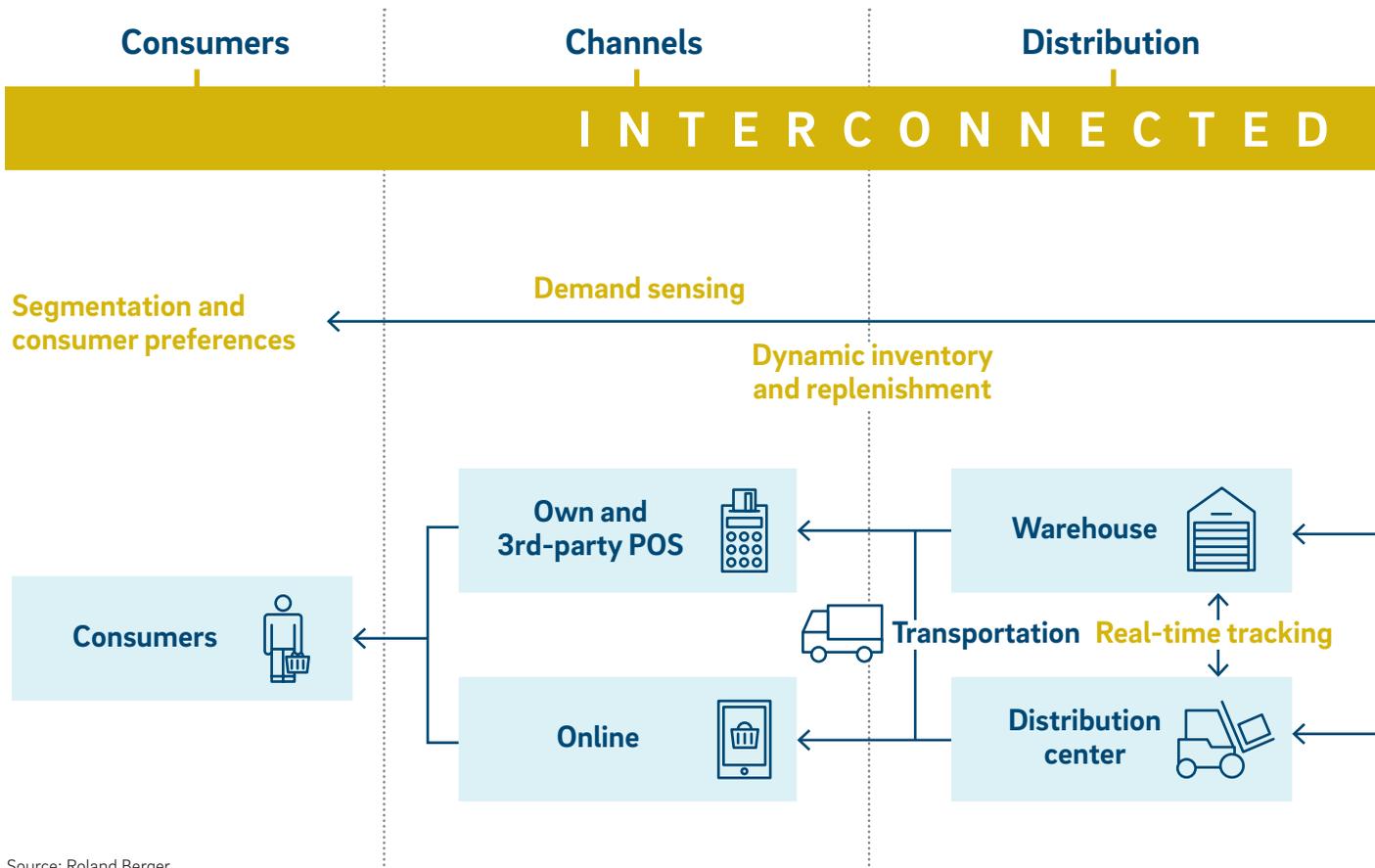


gration of the supply chain planning system involves viewing key metrics (inventories, SLOB and so on) in real time, drilling down and rolling up production plans by SKU and at market, factory and consolidated level, and creating a seamless, error-free master data environment to ensure data integrity. Automation involves eliminat-

ing or minimizing offline activities and manual interventions such as planning by telephone, email and Excel file exchange, and automating transactional tasks. The third lever – analytics – involves adding non-existent functionalities such as advanced scenario planning capabilities and dashboard/control towers across the sup-

**E: A bold new vision.**

An example of a future supply chain and the potential role of digitization.

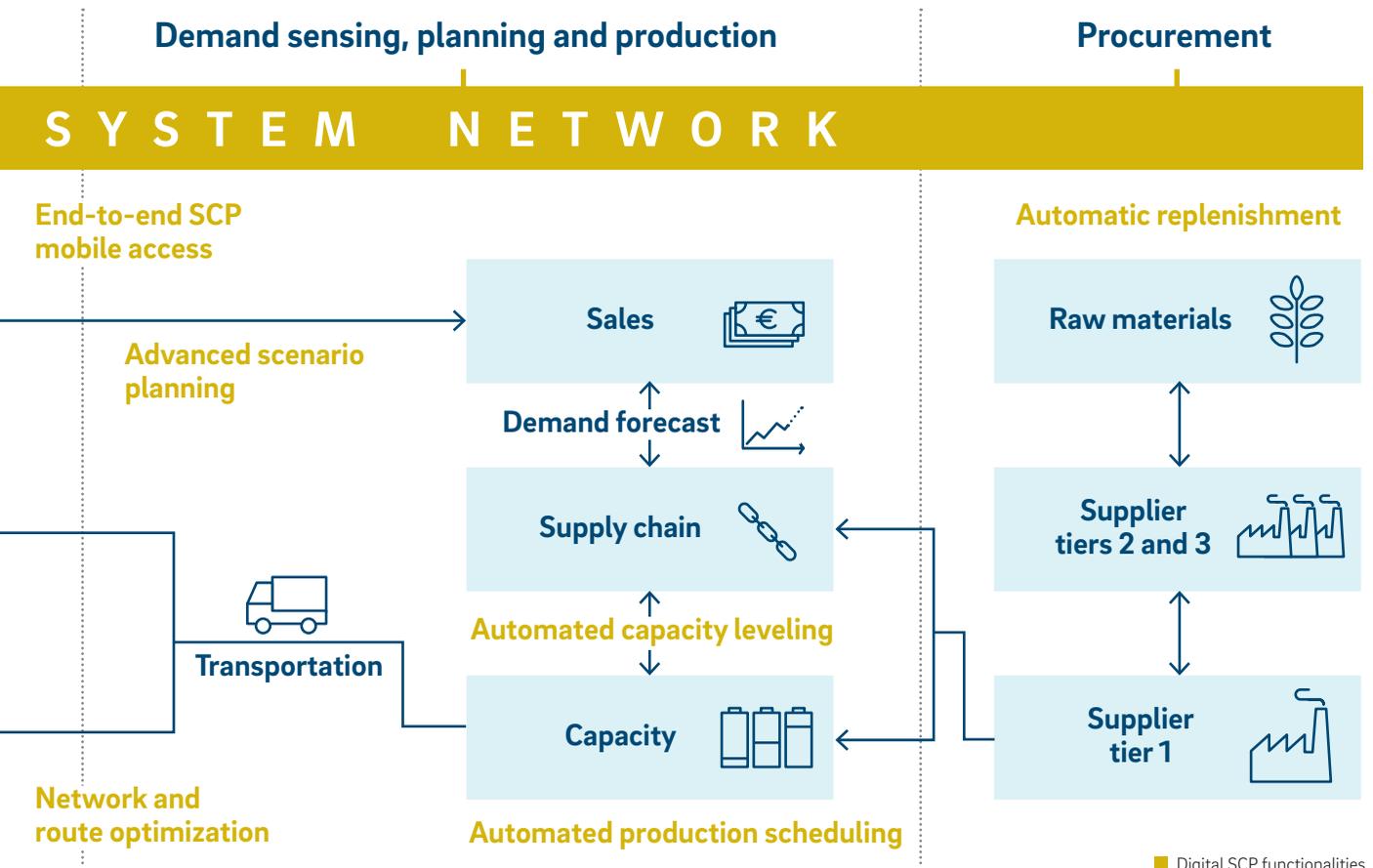


ply chain, and using advanced analytics to optimize process parameters, for example through demand sensing.

**PHASE 3 – IMPLEMENTATION**

The implementation phase begins with the creation of a project management office (PMO), followed by strict

execution of the implementation plan. The PMO carries out controlling, coordination, support and reporting tasks. For successful change management, strong leadership is needed to bring together the three important pillars for change: an understanding of the reasons for the change and its urgency, a willingness to

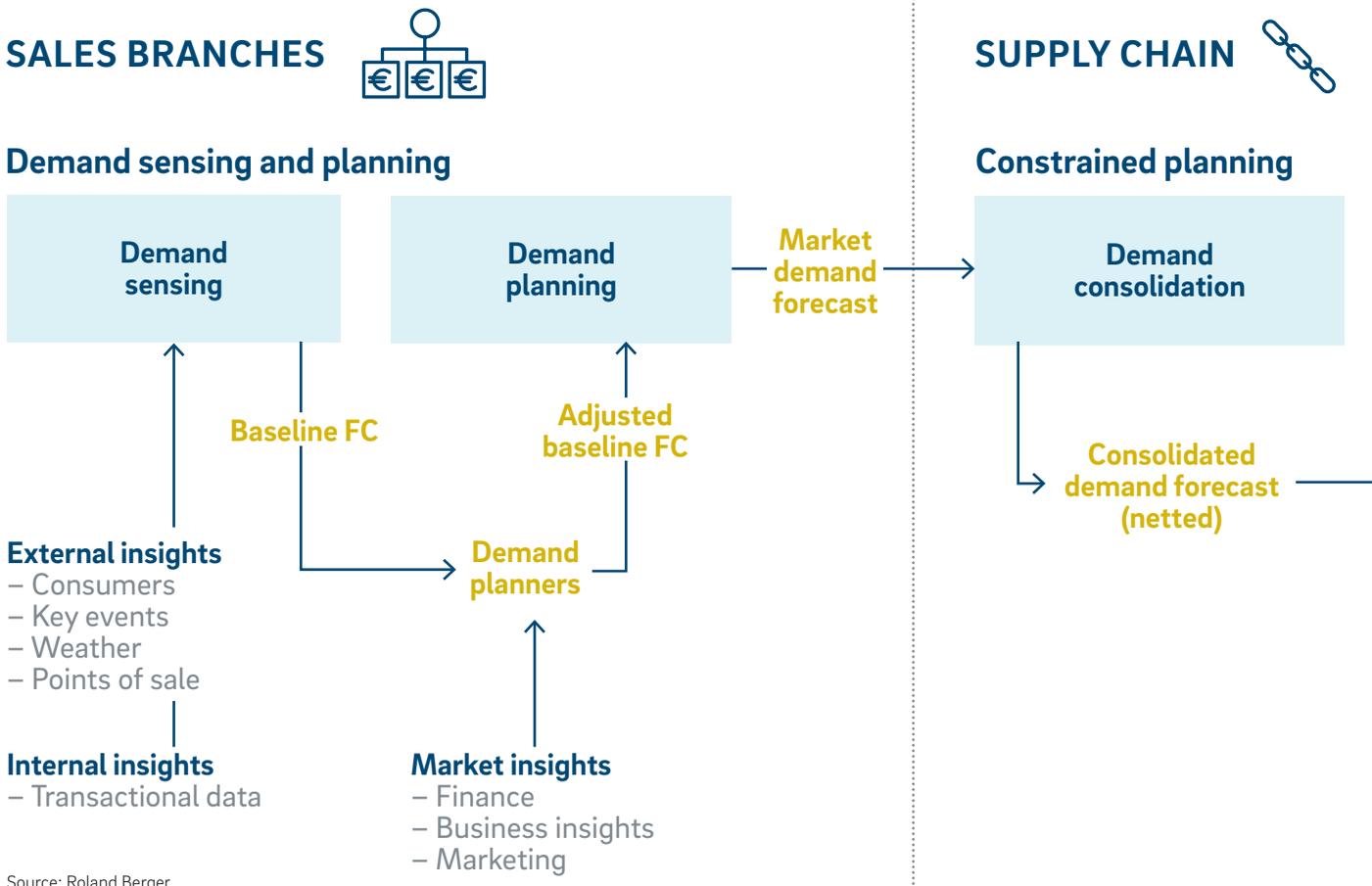


change, and the ability to develop the required skills. The implementation should start with a number of quick wins. The company should run pilot projects introducing a new short-term planning calibration process, a new demand planning setup, process improvements, an S&OP and short-term planning calibration

meeting, and process gates and metrics with aligned planning timeframes. It should optimize its organizational charts, introduce new KPIs and incentives, and redefine career paths and profiles. It should also pilot demand sensing or scenario planning, ensure the reliability of master data in systems, and establish bare-

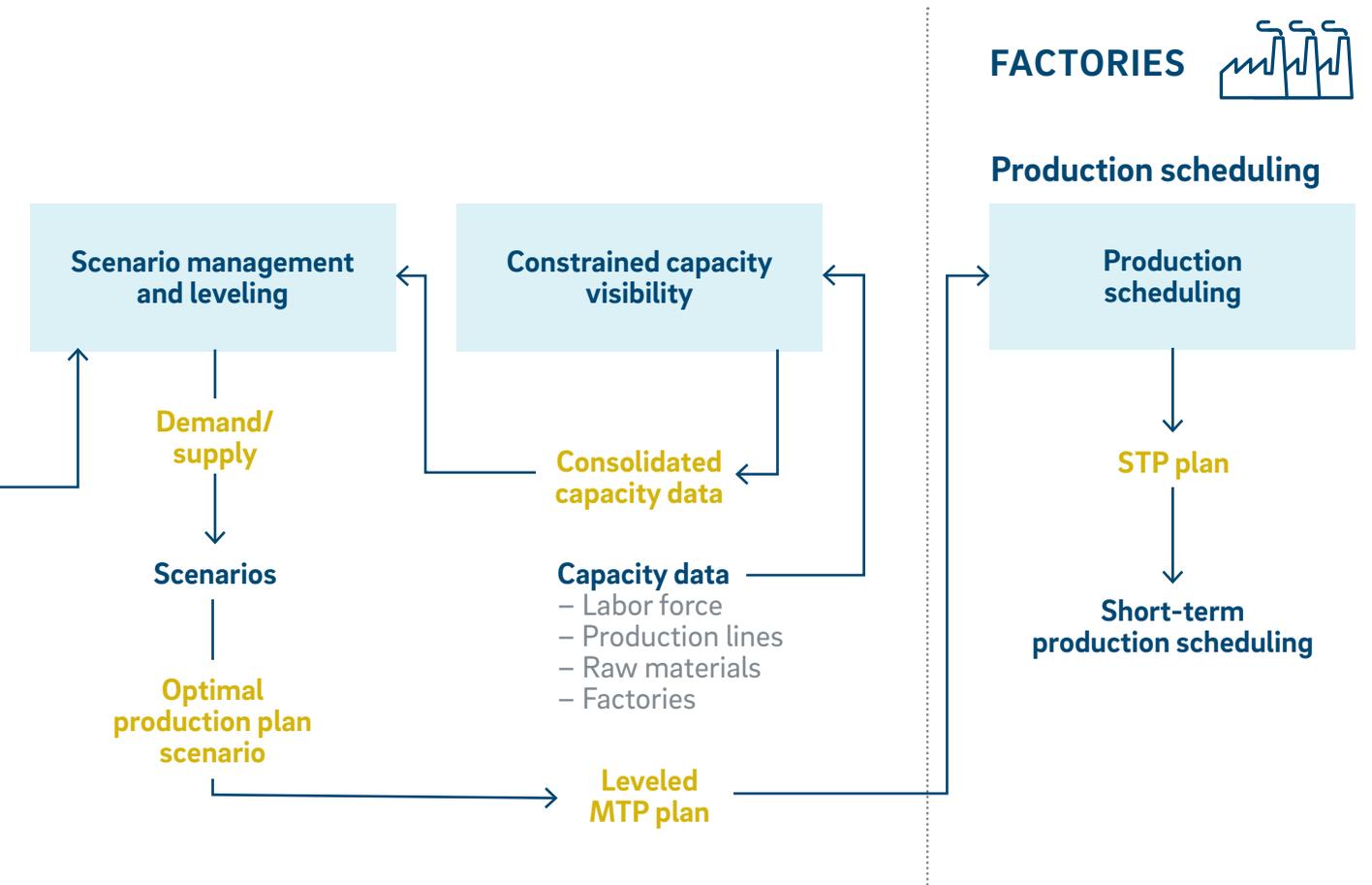
**G: SCP 4.0 system configuration.**

Key modules in the future system landscape.



bone systems for process changes. This "quick win" phase will typically last around nine to ten months. To achieve its future vision for the supply chain process, the company must disseminate the demand planning philosophy globally, ensure fully operational integration production planning, and establish the S&OP

meeting as the central decision-making body. It can now roll out the organizational blueprint in all countries and fully interconnect all systems. Companies typically achieve this between 15 and 30 months after project kickoff, depending on their starting point and the size and complexity of their organization.



# The bottom line

Do the benefits of implementing SCP 4.0 outweigh the costs?

The benefits of implementing SCP 4.0 are both tangible and intangible, having both a direct and indirect effect on the company's profit and loss statement. But implementing SCP 4.0 also involves considerable costs. The question is whether these investments are worthwhile and how soon a company that embarks upon the road to transformation can expect to achieve payback.

We divide costs into one-time costs (such as for the implementation of supply chain planning system suites), internal costs (relating to the transformation), external costs (for software vendor support) and recurring costs (such as annual license fees for supply chain planning system suites). The benefits of implementing SCP 4.0 are recurring, and include better use of personnel and operational improvements. In the area of personnel, experience shows that companies can achieve a 20 to 30 percent reduction in short-term planning changes and a five to seven percent reduction

in end-to-end planning effort thanks to automation. In operations, companies can expect to see a reduction of 15 to 25 percent in SLOB and 3 to 10 percent in inventory days, and an improvement of 15 to 20 percent in forecasting accuracy and one to three percent in factory uptime. → **H**

Overall, our experience supporting companies engaged in transformation leads us to expect a payback period of two to four years, with an internal rate of return of 15 to 25 percent. SCP 4.0 also brings intangible benefits such as greater employee satisfaction, higher capacity utilization and uptime, better process control and adherence, a shorter time-to-market and increased supply chain agility and responsiveness. On balance, the answer is clear: Implementing SCP 4.0 is a lengthy process but ultimately a rewarding one. Supercharging your supply chain process performance is the only option for forward-looking companies.

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**H:** Typical benefits of SCP 4.0.

2-4 year payback.

Short-term  
planning changes

**-25%**

Forecast  
accuracy

**+20%**

Slow-moving  
and obsoletes

**-20%**

Days  
of inventory

**-7%**

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## WE WELCOME YOUR QUESTIONS, COMMENTS AND SUGGESTIONS

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