

Lean in Supply Chain Planning

**Towards Achieving and Maintaining
Excellence in Supply Chain Planning**





Lean in

SUPPLY CHAIN PLANNING

Prepared by:

Belinda Griffin-Cryan

Herbert van der Raad

Marie-Anne Sparks

Thiagu Mathan

Thierry Desnos

Capgemini Consulting North America

Capgemini Consulting UK

Capgemini Consulting France

Capgemini Consulting India

Capgemini Consulting France



In today's business environment, many organizations understand the value that Lean Management philosophies can bring to help them remain competitive.

At its most basic level Lean Management is a simple proposition to understand - it is about "value". Every good Lean initiative starts by understanding what value means in the eyes of the customer. Lean then sets out to pinpoint where and how value is added and then focuses on ensuring that resources are targeted to deliver that value as effectively and efficiently as possible, eliminating 'waste'¹ in the process. The result is greater emphases on providing the value customers are willing to pay for while in many cases being able to simultaneously reduce cost.

It is not surprising then that a recent survey conducted by Capgemini Consulting revealed that over 80% of organizations are using Lean tools and methodologies. However, the survey also

highlighted that Lean concepts do not appear to have been applied equally across the Supply Chain processes. While most organizations have seen a clear potential for Lean in Manufacturing and Logistics, only 16% of organizations have fully embedded Lean principles in Supply Chain Planning. An explanation may be that this is primarily due to Planning being a data intensive process and, also, that Planning is often considered to be a back office function. Those who understand Lean as a 'cost-cutting' exercise will be apprehensive about the cost benefit that can be expected and the application of Lean tools in the Planning process may seem foreign.

However, as leading organizations such as Kellogg's have found, Lean principles are highly applicable to Supply Chain Planning. Not only in helping to make the Planning process more efficient and effective, but as an essential ingredient in achieving a truly Lean Supply Chain – one where customer demand is anticipated and met "on time and in full" with lower overall resource requirements.

¹ In Lean terms, any activity or process step that does not add value from a customer perspective is called 'waste'.



How can Lean improve Supply Chain Planning?

According to the most recent Capgemini Consulting – Supply Chain Planning study², managing volatility, managing variability and the continued pressure to reduce Supply Chain costs remain top challenges for Supply Chain and Planning managers.

Lean is proving to be a significant asset for any Planner to address these challenges, from implementing short interval controls to root cause analysis and implementing countermeasures to address forecast variability. Lean can also help address other top Planning challenges around inventory such as accurately calculating available-to-promise quantities (ATP), planning for sales promotions, and generally avoiding high levels of inventory.

Being customer-centric and value-driven, Lean Planners will strive to develop a far greater understanding of the customer needs behind demand signals; not just the number of units required and when they need to be delivered to the customer, but what's driving order sizes, order frequencies and the things that cause the customer to change their requirements over time. This starts with analyzing specific product and customer demand forecasts and setting up

systematic continuous improvement processes to address the most consistent root causes of forecast variations. Lean Supply Chain Planning also involves segmenting product and customer groups in much more detail to focus Planners' time and effort on segments where forecast variation has the most impact.

Turning from the demand side to the supply side, Lean techniques help Supply Planners to pinpoint where and how value is added and delivered. Working together with Manufacturing, Logistics and other functions, Planners can co-create a system that really does flow at the pull of the customer. Through Lean, Planners gain a new appreciation for the trade-offs between manufacturing contingencies and inventory levels.

Lean applies just as strongly to the Planning process itself. Once a culture of continuous improvement is in place, Planners will measure their own effectiveness against a 'first time right' objective, reducing the amount of manual alterations to plans. Plans self-adjust, and where they don't, Lean Planners routinely investigate root causes of exceptions, and put in place countermeasures to address them.

² Capgemini Global Supply Chain Planning study talks about the current challenges, future trends and opportunities for improvement in the Supply Chain Planning area and also provides insights into the leading practices, capabilities and process maturity globally. For more information on this study, click here - http://www.capgemini.com/services-and-solutions/consulting/supply-chain-management/publications/global_supply_chain_planning_2009/

Lean principles in Supply Chain Planning

A Lean Supply Chain Planning process is one where improved performance is achieved by focusing on the customer, and creating a system that ensures value flows at the pull of the customer. Continuous improvement is achieved by constantly evaluating the value added by Planning activity and ruthlessly eliminating 'waste' in the system as well as the Planning process, thus ultimately satisfying customer demand fully and on time with minimum internal resources. This can be accomplished through the application of Lean Management throughout the Planning function.

Some of the key Lean principles that improve Supply Chain Planning performance are:

Single forecast and consensus internally: Keeping in mind the voice of the customer (whether customer of the plan or customer of the organization) – make sure everyone shares the view of what the customer of the organization wants through a single forecast and share what the internal users of the plan need – obtain consensus of Sales, Marketing, Production, Supply, Finance and other stakeholders

Data with high accuracy and at the right level of aggregation: Lean Management focuses on collecting and using only required data (collecting unwanted data leads to 'waste'). Continuous work of Planning teams will focus on obtaining the right level of accuracy for the purpose and the right level of aggregation

Definition of roles and responsibilities for execution of processes: The participation of various roles (employees both within Supply Chain Planning function and other functions within organization) are well-defined for proper execution of the Planning processes

Planning is analyzed in order to prioritize the "failure modes" according to their impact: The first step is to minimize the main risks. For risks that cannot be reduced, alerts and management rules are defined (for example - change in demand, capacity shortfall) in the Planning processes so as to act together, with the right people, and appropriately in case of exceptions

Alert systems for deviations: This involves the ability to alert the Planning stakeholders when there is a deviation in the plan or deviation in set standards (for example - minimum inventory levels) and having guidelines to act on these deviations

Bottom-up feedback loop and short interval controls: This helps improve the accuracy of the plan. Demand characteristics including actual demand, change in consumer buying behavior and external market factors need to be constantly fed as inputs to the Planning process. If the plan cannot be adhered to by the shop floor or is not used, the Planning team needs to understand why and correct the Planning process appropriately

Visual management for review and reporting: Lean advocates that the presentation of data and



information at review meetings and for reporting purposes be done visually at the meeting venue for better impact and faster decision making

Employee empowerment and continuous improvement culture:

Lean Management necessitates an organization-wide focus and effort on continuous improvement of Supply Chain Planning in order to achieve sustained improvement

Lean Supply Chain Planning also serves as a corner stone for sustainable Lean execution at the shop floor level. Planners and shop floor level employees need to work together across all four key elements given below to attain Lean Supply Chain excellence

Stabilize: Identifying causes for variations and reducing variations

Fluidify: Identifying the bottleneck and work the flow around the bottle neck; defining the type of Supply Chain model and the decoupling point per type of product

Smooth: Understanding the causes of customer induced variation (through Voice of Customer); defining the TAKT time per type of product and pull production through the shop floor according to TAKT time

Synchronize: Reducing batch size to tend towards one piece flow through Single-Minute Exchange of Die (SMED) and other tools

Value generation in Lean Supply Chain Planning

In Lean Supply Chain Planning, value is added at every step in process depending on the requirements of the customers. Understanding who the customer is at different stages in Supply Chain Planning is of prime importance to ensure the value is generated as per that customer's needs. For Supply Chain Planning, the customers are plan users and organization's customers. A Lean Supply Chain Planning process is designed keeping the customers as the focal point. This process captures final customer requirements and creates plans to service the requirements on time. Any change in customer requirements (in terms of SKU, quantity, delivery times etc) will trigger value addition in the processes.

This will lead to the creation of new supply and demand plans which leads to value addition in downstream Planning and execution processes to service the new demand. In addition to addressing the changing customer requirements, Lean also strives to reduce the number of modifications to plans thus eliminating frequent changes to downstream processes. Lean Supply Chain Planning ensures that plans are done at optimal frequency and optimal time duration providing the ability for capturing any change in customer requirements and incorporating this requirement change in the plans. At the same time Lean ensures that there is no undue strain on the supply and manufacturing flexibility.

The 7 'wastes' in Supply Chain Planning

Along with value addition, Lean also results in the elimination of 'wastes' in the process. There are many 'wastes' in Supply Chain Planning which can be categorized according to the 'waste' categories

defined by Lean Management principles. Some examples of Lean-typical 'wastes' that can be eliminated by following a Lean approach to Supply Chain Planning are provided below.

Types of 'wastes' in Supply Chain Planning	
Lean-typical 'waste'	'Waste' in Supply Chain Planning – Examples
Over - production	<ul style="list-style-type: none"> • Too many plans, too often • Too much data in the plans • Too many forecast numbers from different business entities
Inventory	<ul style="list-style-type: none"> • New plans are produced while stakeholders are still processing previous plans
Motion	<ul style="list-style-type: none"> • Checking plans with non-stakeholders • Reviewing data more often than necessary • Meeting with inadequate attendees
Waiting	<ul style="list-style-type: none"> • Lost time due to late receipt of inputs for planning (Example - forecasting parameters, capacity changes, and promotions data etc)
Transportation	<ul style="list-style-type: none"> • Checking with new business units/product groups for their initial plans • Organizing unjustified meetings • Rearranging consensus meeting as earlier meetings did not result in consensus
Over-processing	<ul style="list-style-type: none"> • Duplication of data collection and collection of non-essential data • Too frequent reporting of performance than necessary • Detailed plan that may not be required for the next Planning level
Defect	<ul style="list-style-type: none"> • Unprepared S&OP or MPS meetings • Adjustments to plan due to inaccurate plan at first instance • Inaccurate master data leading to wrong numbers • Plan not usable for operations

What is different in Lean Supply Chain Planning?

Lean Supply Chain Planning differs from traditional Supply Chain Planning in the way the process is managed to drive continuous improvement and a relentless focus on value. Traditional Supply Chain Planning is typically a standardized process providing organizations the ability to plan and fulfill customer

requirements. However, Lean Supply Chain Planning, due to its focus on continuous improvement, improves the organization's ability to provide enhanced value and satisfy customer requirements in a more optimal manner. The key differences between traditional and Lean Supply Chain Planning are listed below.

Key differences between traditional and Lean Supply Chain Planning		
Topics	Traditional Supply Chain Planning	Lean Supply Chain Planning
Process	Focus is on managing the same Planning processes periodically	Focus is on continuous improvement of Planning processes
Data	Varied and specific to each part of the organization	Focus is on the few required data for Planning and sharing this data across the organization
Plan review	Reaction to new information	Using auto-adjustment mechanisms by horizon to streamline Planners work
Plan accuracy	Plan accuracy and use not managed	Tracking and continuous improvement of plan accuracy. A drive towards making to order by continuously working at reducing lead times
Exception management	Adhoc process; analysis and actions taken on need basis	Alert management for exceptions; Exceptions are tracked, their root causes identified systematically and prioritized in view of elimination
Feedback and control	Limited feedback	Systematic and organized; Bottom-up feedback loop with short interval controls to identify and respond quickly to issues
Inventory	Planners consider inventory as a "co-product" of the process that needs to be calculated	Planners consider inventory as a 'waste' that needs to be eliminated
Culture	Focus more on managing the process and improvement usually is top driven and on need basis	Continuous improvement is the driving force and is usually bottom up

Key components of Lean Supply Chain Planning

Organizations initiating a Lean program in Supply Chain Planning should consider a few important aspects to ensure success of the Lean program. The key components of a Lean Supply Chain program are:

- Understanding the customer(s) of a given Planning activity and what adds value to them
- Designing Supply Chain Planning process around the pull of customers
- Coaching and empowering Planning team members
- Using an appropriate Supply Chain Planning technology
- Building a Lean culture within the extended Planning organization

Understanding the customer(s) of a given Planning activity and what adds value to them

In Lean Management, the value of each activity or process is measured from a customer reference point and hence it is essential to understand the customer(s) for the activity and what adds value to them. In Supply Chain Planning, customers are organization's customers and also the plan users. The initial stages in a Lean Supply Chain Planning program entail understanding the requirements of the Planning customers including total demand and its profile, delivery requirements, aggregation level of plan, and frequency of plans. For example, in Sales and Operations Planning it is important to understand what purpose the plan serves, who the users are, what are their needs, when they need it, and with what level of detail. Only the steps required to satisfy these needs are integrated in the Sales and Operations Planning process.

Taking this approach makes it easier to find the right level of detail at each Planning level. This focus on requirements for the standard process also needs to incorporate appropriate predictive elements, and define the general procedure for addressing the various types of gap to plan that may occur. Any gap to plan requiring a special process would then be analyzed to understand what can be learnt from the event. The natural target state for Planners is no gap to plan, with the plan used appropriately at each level, and no fire-fighting.

This approach can be used for all Supply Chain Planning processes including Sales and Operations Planning, Demand Planning, Supply Planning and also all execution level Planning processes including Production Planning, Scheduling, and Sequencing.

Designing Supply Chain Planning process around the pull of customers

A Supply Chain Planning process should be standardized and robust enough to manage both the regular Planning cycle and exceptions that may occur. The design of the Planning process must consider the requirements of plan users and the organization's customers. Applying Lean in Planning will provide value to customer in the form of Planning optimization and the elimination of all forms of 'waste'. A representation of the drivers that can help in transforming the Supply Chain Planning process to a Lean process is provided below.

Lean drivers for Supply Chain Planning Process	
Reduce non value added activities	<ul style="list-style-type: none"> ● Minimize transport, stock, rework and other types of 'waste' in overall Supply Chain Planning ● Align Supply Chain Planning with Voice of Customer to reduce re-work or over-production ● Find the bottleneck at the operational level to reduce Non-Value Add (NVA)
Pull the flow	<ul style="list-style-type: none"> ● Find the decoupling points at all levels (multi site, site-level etc) ● Pull customer orders to stock (define finished goods stock levels)
Do it right the first time	<ul style="list-style-type: none"> ● Don't adjust the plan too often ● Monitor and correct variation
Cuckoo clock	<ul style="list-style-type: none"> ● Implement planning through TAKT time management ● Don't adjust the plan too often, let it auto-adjust ● Manage by exception
Minimize variation	<ul style="list-style-type: none"> ● Understand the causes in the forecast variation, check sensitivity to small root-cause variation ● Work to minimize variation in output at different levels ● Don't cause variations to the plan through SC intervention
Be flexible	<ul style="list-style-type: none"> ● Minimize modifications to IT required because of innovation in terms of new product, new market etc. ● Reduce "change over times" taken to apply new plans ● Review plan more frequently but with different levels of change allowed at different time frames

Coaching and empowering Planning team members

Employee coaching and empowering Planners to strive for improvements in the activity they manage is a key element in Lean Management.

Coaching can be done using simple shared "tools" or visual management that everyone uses and that is explained in "One Point Lessons".

This will include standards on how to forecast, where to obtain the information, and how to process the information. These standards will need to be adhered to and in some cases "internal audits" can be used to

either improve the standards or to coach a person into applying them. Process training and Lean training for Planners will help them to take ownership of the Planning activities and work towards continuous improvement in their activities.

Using an appropriate Supply Chain Planning technology

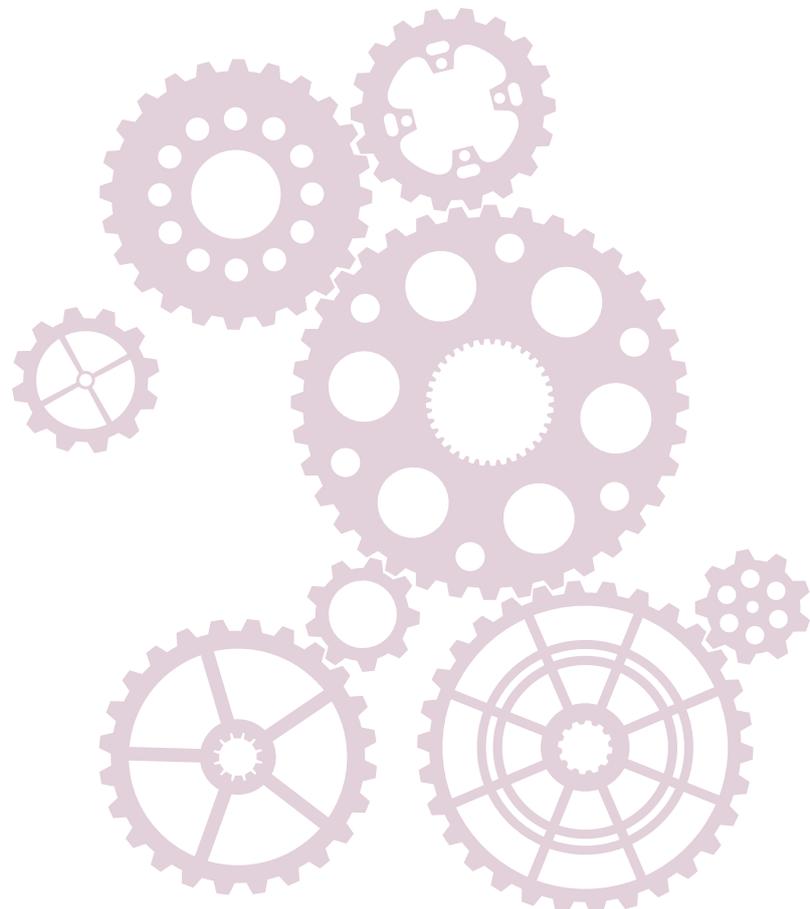
Technology is a key enabler for a Lean Supply Chain Planning process and helps in proper execution of the process. End-to-end Planning process automation, flexibility to select appropriate forecasting models, the

ability to set rules and parameters based on product demand patterns, the ability to set alerts for deviations, analytics and reporting capabilities are some areas where technology plays an important part in Lean Supply Chain Planning.

Building a Lean culture within the extended Planning organization

Lean is not a one-time deployment and improvement activity. A Lean program within the Planning function is self-sustaining only if the entire Planning organization embraces the Lean concepts and works towards improving Planning processes and activities on a continuous basis. A continuous improvement mindset needs to be embedded within the organization and Planners need to be

genuinely empowered to make changes to activities. A Lean culture where there is top management focus, and cross-functional collaboration with Sales, Finance, and Manufacturing helps in achieving the long term benefits of adopting Lean. Additionally, it is essential that the cultural aspect is addressed right from the start of any Lean program. This can happen only if management is deeply involved and leads from front the different activities in their scope. Putting in place 5 minute briefings and visual management will contribute to effective Lean Management of the Supply Chain, as will the appropriate reporting, measurement, recognition and organization structures.



CASE STUDY:

How Kellogg's have seen 11% uplift in forecast accuracy and 5 days reduction in safety stock by implementing Lean in Supply Chain Planning

Kellogg Company

is the world's leading producer of cereal and convenience food products including cookies, crackers, toaster pastries, cereal bars, frozen waffles, beverages and vegetarian foods. The company has manufacturing facilities in 18 countries and sells in more than 180 countries around the world. In 2010, Kellogg Company achieved net sales of \$12.39 billion with an operating profit of \$1.99 billion.

Kellogg's Europe started their Lean journey by implementing Lean principles and developing a Lean culture within their Manufacturing function. It was soon very clear that the benefits and the organization change seen in Manufacturing would be equally applicable more broadly within the Supply Chain community. Their Lean program (called K-Lean) soon extended into Logistics, Procurement, R&D and most other Supply Chain functions. With an increasing focus and understanding of 'value' across the end-to-end Supply Chain, it became quite apparent to Kellogg's that incorporating Lean in Supply Chain Planning will provide enhanced value. In addition to Planning specific benefits, such as the reduction of working capital and improved forecast accuracy, the Lean Supply Chain Planning initiative also sought to help consolidate and further embed the benefits being achieved through the Lean work being successfully delivered in operations and start engaging the commercial functions in "the Lean way".

Having already partnered with Capgemini so far in their Lean journey, Kellogg's were keen to continue the collaboration with Capgemini and leverage our BeLean® methodology to install and embed sustainable change in Planning.

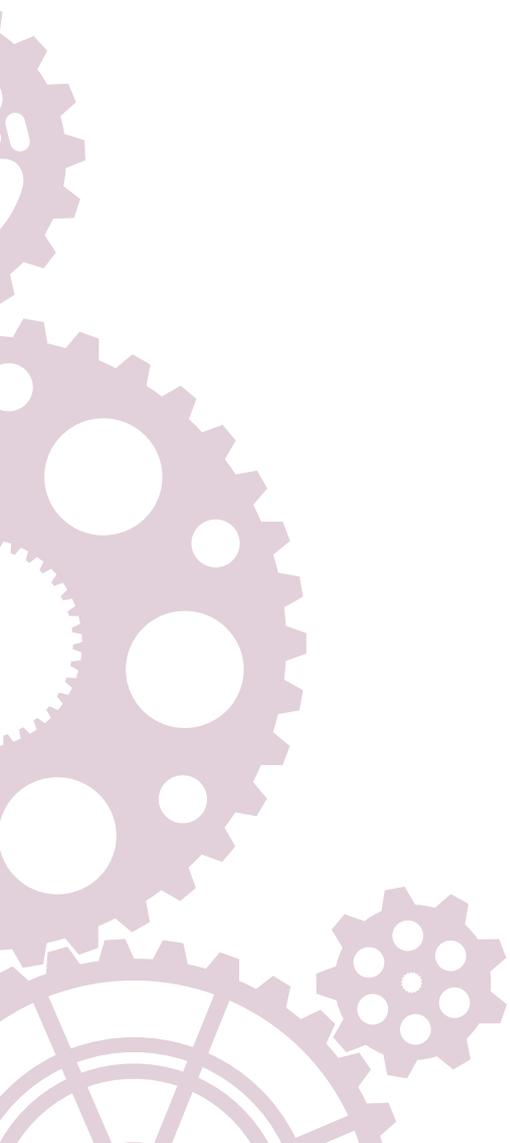
With the overall objectives focused on the full Sales and Operations Planning process, the Lean Supply Chain Planning initiative first started with embedding Lean principles within Demand Planning and Supply Planning processes. By developing the value focus and continuous improvement culture in these areas first, Kellogg's recognized that the

foundation for a Lean S&OP process would be in place and the benefit and momentum would be established to engage key S&OP stakeholders and process owners outside of Supply Chain.

On the Demand Planning side, Kellogg's faced the same pressures and challenges in establishing a robust sales forecast like most large Consumer Products companies. The dual objective of establishing Lean within Demand Planning were therefore, firstly to improve Demand Planning processes with an aim of improving demand forecasts and secondly to embed a culture of 'continuous improvement' across the Demand Planning community, one where Demand Planners would rigorously and routinely evaluate the root causes for forecast deviations and put in place countermeasures to address these.

Together, Capgemini and Kellogg's Demand Planners from the two pilot markets – UK and France – set about an improvement program which included the following:

- Products (stock keeping units or SKUs) were segmented within prioritized customer groupings based on the demand characteristics of the customer and product combination as well as the 'value' considerations.
- Different forecasting techniques were evaluated against each of the new categories. Where suitable, statistical forecasts were leveraged to far greater extent, freeing up Demand Planners time to focus on only those products where their time and effort would help improve



Demand Planning and forecast accuracy.

- A Management System was established in each market running against a Demand Planning Information Centre for Demand Planners to review KPI's against different customer and product segments, identify where improvement priorities reside and initiate, manage and conclude root cause analysis and improvement plans.
- A European Management System was set up to collate the information from across each of the European Markets to be able to track and manage performance at a European level.
- A combination of advanced Planning and Lean techniques training was delivered across the Demand Planning community to establish improved Planning knowledge but to underpin this with the continuous improvement culture.

The early results of implementing Lean in Demand Planning has seen a 11% base forecast accuracy improvement (excl. promotional and other sales uplift) across the SKU's piloted. The same principles are being rolled out across all products and markets in a staged approach.

In Supply Planning, the initial emphasis of the Lean initiative was to remove unnecessary levels of safety stock to achieve the same service levels, or where possible to improve these. The intention, while having financial advantage in reducing working capital, was to demonstrate in a critical area, how Lean principles would achieve improved value and performance in Planning. Again, an equally important objective was to establish a process and culture that would ensure routine analysis of performance and seek to continually

improve the delivery of value and efficiency.

The Supply Planning side of the improvement program included the following:

- Products (stock keeping units or SKUs) were segmented from a 'supply' perspective to get a more detailed and effective breakdown of categories to analyze and establish safety stock strategies.
- Different safety stock calculation methods were evaluated against the Kellogg's profile and the most effective method was selected. Ultimately through a greater evaluation of the trade-off of service levels and required safety stocks at a more granular level, the potential to maintain up to 99% service levels was identified with approximately 5 days worth of safety stock removed from the system.
- Processes were also evaluated to identify any 'wastes' and improvement opportunities. A key example being the process to identify the availability of additional stock or manufacturing capacity where additional short-term sales opportunities presented themselves. Where every one of these requests would take several days to process, the Lean initiative helped to reduce this to within seconds for a significant amount of these types of enquiries, leaving Planners to spend time only on the more complex of these – also significantly reducing the draw on their time and efforts.
- A Supply Planning Management System was established for Europe to continually track safety stock improvement potential against service levels and the effectiveness of key parts of the Planning process.
- A combination of advanced Planning and Lean techniques training was

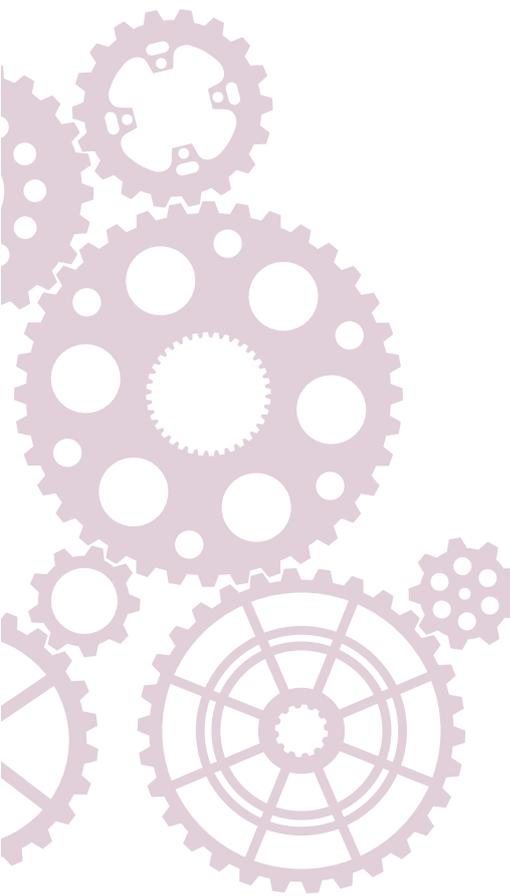
delivered to Supply Planners to establish improved Planning knowledge but to underpin this with the continuous improvement culture.

The early results of implementing Lean in Supply Planning has seen an approximately 5 day reduction in safety stocks of the pilot products while maintaining service levels.

Kellogg's realized significant benefits from the Lean deployment in Supply Chain Planning processes in terms of improvement in forecast accuracy and reduction in safety stock. Other benefits included:

- Standardized and repeatable processes with accountability for each process step
- Effective governance of Planning processes and performance
- Well-defined deviation management and reporting mechanisms
- Behavioral change in employees to strive for improvements

The stage is clearly set and Kellogg's are readying themselves for extending Lean into the full scope of the S&OP process, drawing in commercial and financial processes and functions.



Conclusion: How to implement Lean in Supply Chain Planning?

Planning is arguably the only function that enjoys extended visibility into, and influence over, the end-to-end Supply Chain. Implementing Lean in the Supply Chain Planning function can therefore yield significant improvement. Intuitively, it seems obvious that Planning should be in the driving seat of Lean – and companies in the forefront of Lean adoption are already putting it there.

While some of the early identified benefits can arguably be achievable without Lean techniques, the real change and sustainable improvement comes with the Lean principles that are embedded not just in the

processes but in the people and culture of the organization. With a robust approach to Lean Supply Chain Planning such as Capgemini's BeLean® approach to Supply Chain Planning, an organization can arm Planners with the technical Planning skills to run an effective and efficient Planning process combined with the skills to “do the right work”, “do the work right” and “manage the right way”. When Planners have the capability and mindset to continually analyze and identify where and how the process and outcomes can be improved, any early benefits do not just avoid the risk of eroding but continue to track upward over the long term.



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Capgemini Consulting

Roy Lenders
Global Supply Chain Management Lead
Tel.: +31 (30) 68 90328
Email: roy.lenders@capgemini.com

Thierry Desnos
Global Supply Chain Planning Lead
Tel.: +33 612 80 26 63
Email: thierry.desnos@capgemini.com

Dr. Paul Donnellan
Vice President Operational Excellence
Tel.: +44 (0)870 906 7781
Email: paul.donnellan@capgemini.com

Headquarters
40 Holborn Viaduct
London EC1N2PB
United Kingdom
Tel.: +44(0) 20 7936 3800

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