

Maximising the power of your Supply Chain

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Introduction

Depending on how you define them, Supply Chains can encompass the whole business operation or represent a key component of it. Either way, their effect on business performance is critical. Increasingly directors and managers are recognising the importance of this function and are giving it serious attention. Companies starting from a zero baseline have seen a 10 to 25% saving in operating costs, inventory reduction of between 15 and 70% and a 10 to 50% improvement in customer service levels with the capacity to continue this improvement year-on-year. All of these improvements translate to sustainable profit growth, better cash flow and increased market share. This paper examines how to achieve excellence in Supply Chain performance by focusing on process improvement, best practice methodologies, and change management techniques.

What is Supply Chain?

The term Supply Chain has many and varied definitions. These definitions are usually incomplete in terms of their breadth and sometimes even their depth. This unfortunately leads to misunderstanding and hinders effective application of the concept itself and reduces the full potential of any associated business benefits. A useful definition that is gaining greater acceptance is:

All activities associated with the flow and transformation of goods from the design stage through to the end user. These flows involve physical goods, information and money.

Figure 1 shows the key elements of Supply Chain to consist of Product Development, Procurement, Manufacturing, Distribution, Transportation and Customer Support, all underpinned by related processes, technology and people.

This all-encompassing, end-to-end process view of Supply Chain is powerful because it recognises the interdependency of key functions, is inclusive of what actually flows amongst these functions and highlights the necessary supporting enablers. This view ensures that any changes made to any component of the Supply Chain do not adversely affect overall Supply Chain or business performance.

Where are you now?

If the preceding definition of Supply Chain was unfamiliar then it is likely that your Supply Chain is demonstrating relatively low performance. Figure 2 illustrates that as a Supply Chain configuration moves to become more integrated within an enterprise and ultimately outside an enterprise, the higher its performance becomes. When we categorise the degree of integration into 'Traditional', 'Supply Chain Excellence' and 'Emerging Practices and Beyond' we find that opportunity for business performance improvement, measured in Net Profit After Tax (NPAT), increases significantly from less than 2% to 2 to 10% to greater than 10% either as a one-off or year-on-year.

Supply Chain performance can encompass many attributes but essentially come down to three fundamental metrics that need to concurrently improve relative to an internal baseline or industry benchmark. These are:

- Total Supply Chain Costs as a percentage of Sales
- Delivery In Full On Time
- Inventory Turns

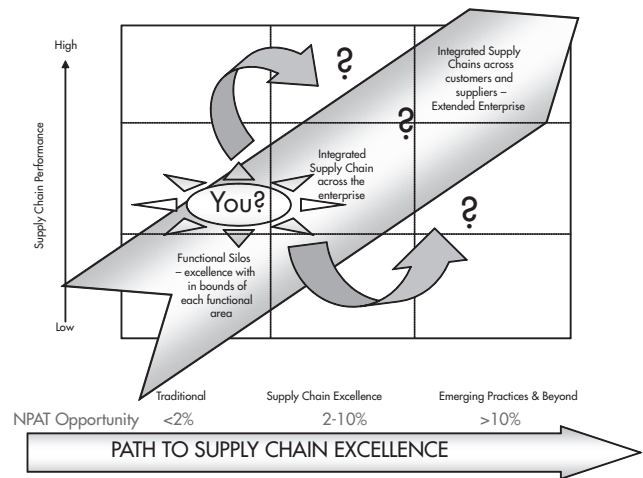


Figure 2. Path to supply chain excellence.

The Supply Chain encompasses the integration of all activities associated with the flow and transformation of goods from the design stage, through to the end user.

Physical goods flow • Information flow • Monetary flow

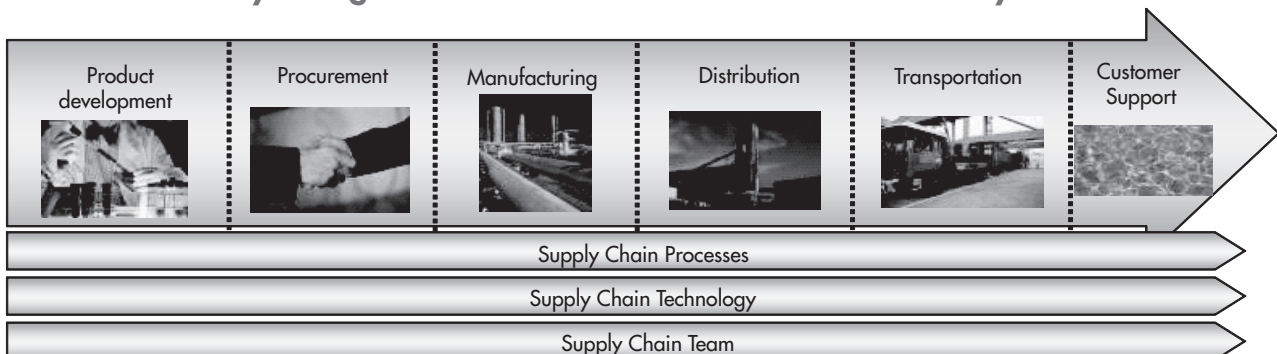


Figure 1. Key elements of a Supply Chain.

Determining which Supply Chain configuration is most ideal and how to move there will depend upon a business's performance objectives, its capacity for change, and the prevailing industry structure.

Supply chain drives business performance

Shareholder value is a core measure of business performance. This may be broken down into profit and invested capital. In turn profit may be broken down into sales and costs, and invested capital into working capital and fixed capital. All four of these, sales, costs, working capital and fixed capital, can be disaggregated even further to many lower level drivers, as shown in Figure 3. These drivers all relate to Supply Chain activities. Such is the pervasiveness of Supply Chain that as these and other activities are improved or better integrated with each other, shareholder value also increases.

Why is supply chain important to the wine industry?

The wine industry is not unique in facing a variety of pressures and issues from internal and external sources. Generally, customers are becoming more demanding, the availability of new technology is increasing, international competition is growing, regulations are changing and shareholders are expecting better financial outcomes. Surplus grape supply, greater export activity and special temperature controls for products only add to the range of challenges. Many of these directly impact or are impacted by Supply Chain performance.

An example of how Supply Chain meets these challenges is the balancing of supply and demand. This is done with planning and control processes that calculate and maintain future requirements of products and key resources. This process is called Sales and Operations Planning (S&OP) and is pivotal in addressing business issues through:

- Robust and practical demand planning
- Modelling of customer service levels, costs and inventory investment
- Development of operation and key resource utilisation plans
- Control mechanisms to ensure plans are met or deviations properly managed
- Identification and correction of sub-target performance opportunities

Supply Chain Alignment

A powerful Supply Chain is one that has strong alignment of strategy, structure, functions and operations with customer needs. It starts by establishing a competitive advantage by differentiating in cost effectiveness and customer service levels in product delivery. To achieve this strategic proposition a platform or operating model needs to be developed. This operating model consists of the product value proposition that will differentiate and a distribution network that will enable

efficient delivery. In turn these structures need to be supported by functions where planning is integrated with key suppliers and customers. Finally, core functions will need to rely on operational alignment involving organisational capabilities, processes, policies, business rules, performance management and technology. All this is illustrated in Figure 4.

Key supply chain processes

In simple terms the Supply Chain process itself covers planning, sourcing, making and delivering. Planning involves business strategy along side supply and demand management. Sourcing and making are more technically known as procurement and manufacturing, and delivery includes inventory management, distribution and transportation. Beneath or behind these are a comprehensive set of sub-processes and enablers that form the foundation of the whole Supply Chain, see Figure 5 for more detail.

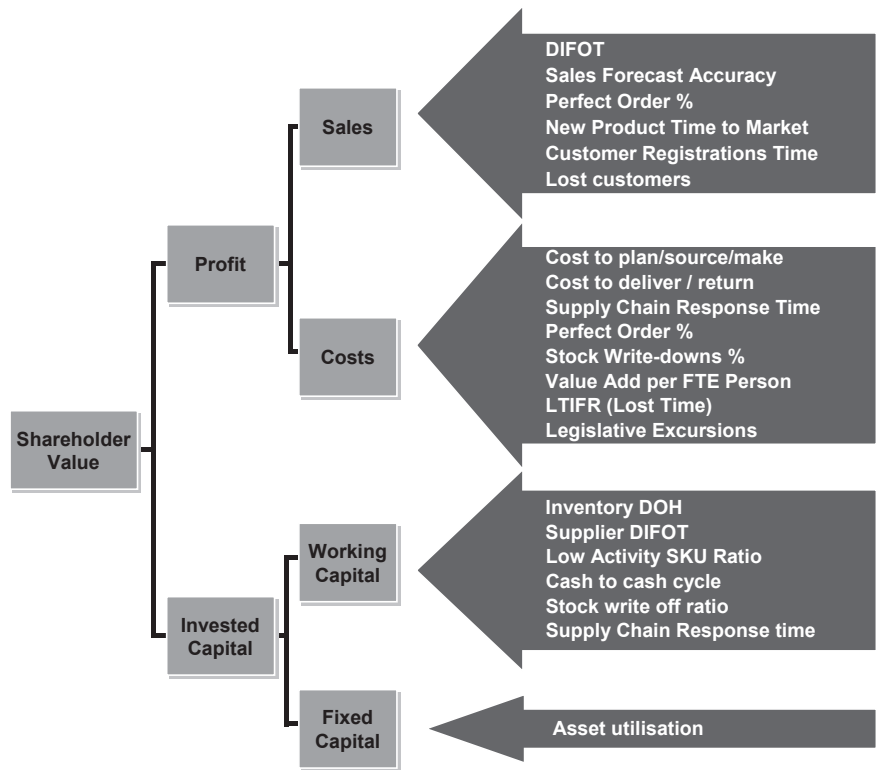


Figure 3. Supply Chain management as a driver of business performance.

Supply chain leading practice can be summarised as alignment of strategy, structures, functions and operations with customer needs. SUCCESSFUL SUPPLY CHAIN MANAGEMENT

What you want to achieve

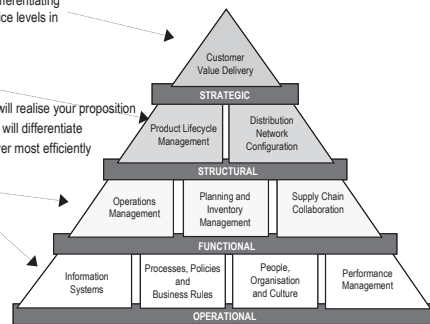
- Establish a competitive advantage by differentiating in cost effectiveness and customer service levels in getting product to customers

What it will look like

- The platform or operating model which will realise your proposition
- The products and value proposition that will differentiate
- The network that will enable you to deliver most efficiently

How you will get there

- The integrated planning with key suppliers and customers to maximise responsiveness and manage costs
- The organisation, capabilities and the culture that will bring it alive
- An effective process structure and management
- Disciplined performance management to ensure value is delivered
- The technology to enable effective management



Aligned strategy

- Customer segmentation
- Service requirements
- Capabilities supporting value delivery

Aligned structures

- Channel design
- Working together
- Products and value proposition that make a difference

Aligned functions

- Excellence in planning and execution
- Supply chain integration and collaboration

Aligned operations

- Processes, organisation, people, business rules, incentives and systems
- Roles, relationships, and accountability

Figure 4. Successful Supply Chain management.

Whilst these underlying Supply Chain sub-processes may appear to be daunting at first, each one needs to be considered on their own or combined with others to match the circumstances being experienced by a company. Those that are ‘mission-critical’ need to perform at optimal levels and be properly aligned operationally, functionally, structurally and strategically.

Some Supply Chain best-practice

The following are some examples of best-practice used in Supply Chain management. Typical benefits from their individual implementation would be a Supply Chain cost reduction of 15 to 40%, inventory reduction of between 15 and 70% and service level improvement of 10 to 50%, depending on what the original baseline performance was.

- Modelling of supply chain network consists of the four types as follows:
 - Basic process flow mapping to increase understanding of the network;
 - Linear Programming to minimise the total cost structure within existing or planned network constraints or configuration;
 - Inventory/service level optimisation to determine cycle and safety stock to achieve required customer service level targets; and,
 - Simulation modelling to understand the upper and lower limits of the network over time during high, low and normal activity levels.
- Sales and Operations Planning (S&OP) – discussed earlier.
- Dynamic planning and scheduling – this involves using software such as SAP’s (Systems, Applications and Products in Data Processing) Advanced Planning and Optimiser (APO) module, and relying on the latest real time information, to conduct purchasing, manufacturing and distribution to the network optimal level.

- End-to-end Supply Chain visibility – developing systems and information flows so that every enterprise in the supply chain can monitor activity beyond its own boundaries. Great for upstream suppliers to respond to end consumer demand and not be affected by wild artificial demand amongst Supply Chain participants that may be characterised as the ‘bullwhip effect’.
- Pull systems – a ‘Lean’ manufacturing concept that structures the network in such a way so that replenishment and/or manufacture only takes place after a customer has consumed the product. It is characterised by short lead times, zero inventory and small order quantities.
- Continuous improvement regime – a formal performance measurement and management process that highlights substandard performance, identifies its root cause, formulate corrective and/or preventative actions and monitors the implementation and adherence to these actions.

Principles of Supply Chain excellence

Seven points capture the essential principles of Supply Chain excellence, they are:

- Formulate and execute a differentiated supply chain strategy based on core customer characteristics;
- Organise around major processes not individual functions;
- Work collaboratively with stakeholders;
- Invest wisely in supply chain Information Technology (IT);
- Invest in supply chain knowledge, people, skills & learning;
- Outsource appropriate elements of supply chain for overall improvement in flexibility, performance and asset utilisation; and,
- Think globally, build regionally and operate locally

Supply Chain strategy has evolved greatly over the past decade. From a simple listing of customer, process, people and financial goals, and alignment amongst these components and the overall

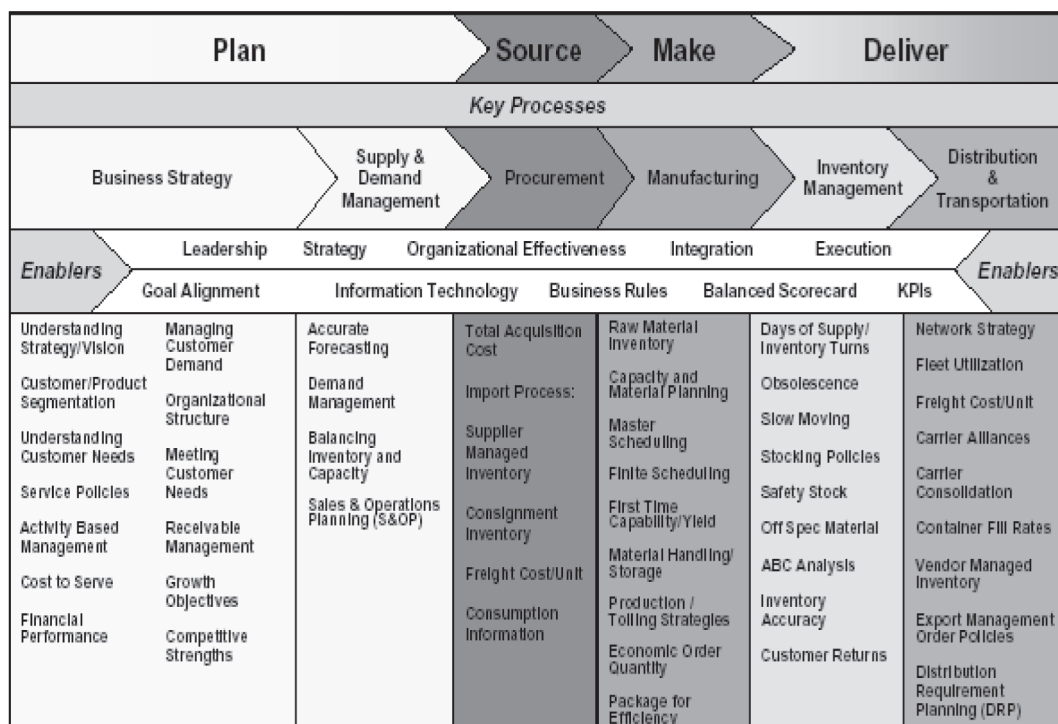


Figure 5. Supply Chain processes.

business strategy, Supply Chain strategy has begun to incorporate more profound and effective considerations. Recently this involved employing strategies of focused and differentiated supply chain structures based on the level of supply and demand uncertainty of product groups. A more recent approach takes this further, still with focused and differentiated supply chains but based on customer behaviour. Whilst organisationally challenging both these latest strategies recognise that a one size fits all structure is past its use-by date.

A lot of hype surrounds the use of IT solutions for Supply Chain improvement. There are many examples of implementations that fell well short of delivering expected benefits. The primary focus should be on the process being developed or improved with any IT solution acting as an enabler for this. Choosing a large, all-encompassing system over a small, specialised application will involve trade-off decisions around cost, implementation time and capability of legacy systems.

There is a growing awareness that Supply Chain is both an art and a science. Along with this awareness is an appreciation that people play an important role in Supply Chain effectiveness for their collective actions and behaviours ultimately determine its outcomes. With this mind, it is critical to invest in proper Human Resource practices such as recruitment, selection, education, training, development and performance management for all Supply Chain related roles.

Beyond excellence with Lean Six Sigma

Whilst there is usually an industry accepted best-practice for most Supply Chain processes, there are certain situations where this best practice is not the optimal solution. Sometimes processes are non-existent or so dysfunctional that they need to be built from scratch. It is not unusual for process improvements to have a history of failure due to wrongly diagnosed root causes or poorly managed change management. Any of the above scenarios are perfectly suited to the application of Lean Six Sigma. Six Sigma standard is to have process performance at greater than 99.997% or less than 3.4 defects per million opportunities.

Lean Six Sigma is set of robust process improvement methodologies, tools and principles designed to get to the heart of process issues and implement solutions that maximise performance and sustainability. 'Lean' was originally pioneered by Toyota, and Six Sigma was developed by Motorola but made famous by General Electric. 'Lean's' focus is on waste elimination where as Six Sigma is about quality improvement and together they form a symbiotic relationship that greatly increases the magnitude and longevity of process improvement. Figure 6 illustrates the three main methodologies available in Lean Six Sigma.



Figure 6. Three main methodologies in Lean Six Sigma.

The critical platform for any Lean Six Sigma initiative is Change Management and Facilitation. This is how the hearts and minds of project team members and any other people affected by the project are properly engaged. It consists of a range of tools and techniques that identify key stakeholders, specific sources of resistance, current and required level of support and preferred communication modes to help develop and execute an effective stakeholder engagement strategy. It addresses the single most common cause of project failure, lack of buy-in. It ensures that people stay motivated through good communication, clear responsibilities and regular involvement.

DMAIC stands for DEFINE, MEASURE, ANALYSE, IMPROVE and CONTROL. Underneath each of these headings are numerous activities and tools used to resolve chronic process problems by identifying root causes, validating solutions, implementing the optimal solution and ensuring solution sustainability. It is heavily data orientated and predicated on operational definitions, measurement and statistical significance. It is the most common Lean Six Sigma technical approach and requires strong change management and facilitation to be conducted along side it.

DFSS stands for Design For Six Sigma. It is also known as DMEDI which stands for DEFINE, MEASURE, EXPLORE, DEVELOP, IMPLEMENT. It is used to develop a completely new process. It is similar to DMAIC in many ways but uses more creative techniques in the EXPLORE and DEVELOP stages. Again strong use of change management and facilitation is required in parallel with it.

What does Six Sigma involve?

Figure 7 illustrates all the activities and tools involved with the application of DMAIC.

The DEFINE stage is about understanding the nature of the opportunity or problem within the business context. It is where the initial scope and objectives are clearly developed so as to drive the rest of the project down the right path. MEASURE is all about data collection with emphasis on making sure that the data is a true and valid reflection of the process under review. Lean tools such as Value Stream Mapping are used here to get deeper understanding on process issues. ANALYSE uses statistical tools to hone in on the identity and magnitude of root causes. IMPROVE is where possible solutions (possible Lean solutions) are evaluated on the root causes and piloted in the real world to validate the most optimal one. CONTROL is about full-scale implementation and locking in of the solution. Whilst the DMAIC process can take three to six months to complete, the ability to deliver 'quick wins' through Kaizen events is also available and encouraged to sustain momentum. A formal gate review meeting is always held after each DMAIC stage to decide readiness to move onto the next stage.

A DMAIC project should be run by a fully dedicated 'black belt' who has been trained and certified in the use of Lean Six Sigma. This person takes the role of project leader but is supported by the following key roles:

- Project Sponsor – business or process owner who is ultimately accountable for the financial success of the project. They are responsible for clear project definition and removing any road blocks the project leader cannot.
- Master Black Belt – project methodology and process coach. Ensures Lean Six Sigma rigour is appropriately applied to deliver valid and sustainable results.
- Green Belts – project team member who can assist with the use of Lean Six Sigma tools or run smaller black belt sub-projects themselves.

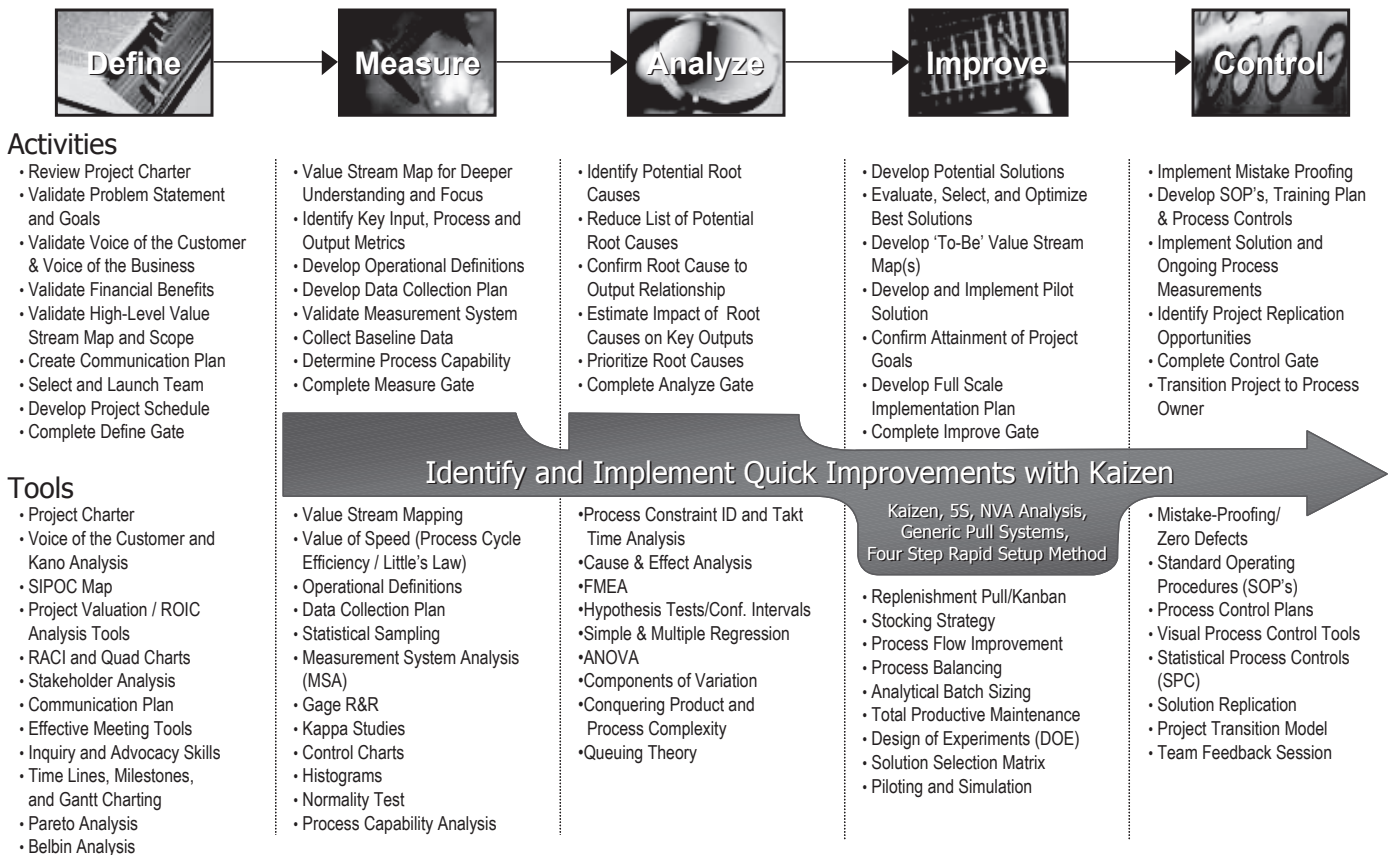


Figure 7. Tools for Six Sigma.

- Project Team Members – consists of three to eight people who are either inside, upstream or downstream from the process or have the range of skills and experience required for project success.

A black belt should be a high calibre individual who is either currently or potentially strong in project management, influencing both vertically and horizontally, analytical and thorough in their use of methodology. The real skill is in balancing a selective mix of tools and techniques to demonstrate significant results as early as possible, whilst keeping everyone well engaged.

How to move towards Supply Chain Excellence

Achieving Supply Chain Excellence is not rocket science. It starts with accepting the end-to-end, fully integrated and process oriented concept discussed earlier. It needs strong leadership to develop a future vision and strategy, and get engagement from all key stakeholders. To execute this strategy successfully, the following points are recommended.

- Understand and define the current Supply Chain
- Establish base programs and good management practices before being too innovative
- Be realistic about benefits and critical about costs
- Manage risk by
 - 'chunking' down to discrete short-term initiatives
 - Implementing in stages
 - Being strong on change management
 - Having sufficient and dedicated resources
 - Establishing Key Performance Indicators (KPIs) and a formal process to manage their improvement
 - Utilisation of rigorous project management methodology

References

Tyndall, G., Gopal, C., Partsch, W. and Kamauff, J. (1998) Supercharging Supply Chains – New Ways to Increase Value through Global Operational Excellence. John Wiley & Sons, Inc. New York.
 Lee, H.L. (2002) Aligning Supply Chain Strategies with Product Uncertainties. California Management Review 44, 3, Spring, 2002, 105–119.
 Gattorna, J. (2006) Living Supply Chains. Person Education Limited Great Britain.