P&SM: Lean and Agile

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Introduction
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This document is about lean and agile organisations, including P&SM.

Definition
‘Lean’ and ‘agile’ are two separate approaches to management, including P&SM, which can be used to achieve the most effective outcomes by organisations.

For an organisation to be ‘lean’ it must have had all non-essential resources removed (ie. anything that does not add value, see below). This is efficient and cost effective, in that the value/supply chain can theoretically do exactly what is needed of it and no more, but requires sound forecasting and planning of demand and supply. It is most suitable for industries with stable product specifications, long lead times and few impulse purchases.

Organisations which are ‘agile’ react as quickly as is practicable to provide a cost effective response to customer demand. This is based on flexibility in design, supply, production and distribution. It is most appropriate for products such as fast fashion and foodstuffs which must be on display and available when wanted by the customer.

Background
The ‘lean revolution’ began in the 1960s with the introduction of the just-in-time (JIT) technique. This way of working is generally associated with the Japanese motor company, Toyota, as it was initially known as the “Toyota Production System”. JIT is a lean production system that was devised by Taiichi Ohno based on the elimination of waste via two new production principles, namely:

- just-in-time - items only move through the production system as and when they are needed
- intelligent automation (autonomation) - automating the production system so as to include inspection - human intervention only being needed when a defect is automatically detected whereupon the system will stop and not proceed until the problem has been solved

These and similar techniques from Japan (e.g. Kanban, a scheduling system that helps determine what to produce, when to produce it, and how much to produce) were utilised mainly in the automotive industry.

During the early 1990s, benchmarking encouraged the emulation and proliferation of such techniques so that by the late 1990s the lean approach was focused on supply chains. Since then, leanness has often been linked with cost-cutting.
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Agile supply chains have generally arisen in areas with very short product life cycles or very erratic demand, such as fashion. They have become more prevalent in recent years as companies in competitive markets have seen the value and competitive advantage in being responsive to customers’ needs.

Lean and agile approaches can work together, and it is sometimes difficult to distinguish which approach is being applied. For example, the removal of wastes usually results in shorter production lead times which are also desirable for agile responsiveness to customer demands. The key difference, not always well understood, is that lean approaches derive from the goal of maximising profitability based on a belief that the market sets acceptable prices and lead times. Therefore a key priority is to reduce the unit cost of production and supply (where unit price is fixed by market forces, Unit price – Unit costs = Profit). Meanwhile, agile is based on the belief that profitable sales maximisation is the critical success factor as sales will be maximised by making product available when the customer wants it. This requires exceptional management of uncertainty (Total Sales – Total Costs = profit) which is composed of both opportunity (positive) and risk (negative). This is not to suggest that lean organisations do not try to affect market share through pricing; they do, but agile companies expect to command premium prices by being in emerging and expanding markets earlier than competitors (in the context of longer term capacity planning).

Explanation

In practice, successful organisations must employ a judicious mixture of leanness and agility. A vital factor is the degree of uncertainty in demand and supply across the value chain. Success requires agility to respond to opportunities and mitigate risks, while leanness is important for profitability.

Influencing corporate behaviour

The P&SM strategy and its supporting policies and procedures must always further the organisational objectives and corporate strategy. For the P&SM function to identify a need for either lean or agile thinking in these objectives, and then implement it, is a major opportunity for the promotion of professional P&SM as it provides demonstrable business benefits when done correctly. CIPS believes that P&SM professionals should work closely with their internal clients to identify ways of effectively implementing lean or agile principles, as appropriate.

Lean

Nowadays, lean thinking is commonly applied, in varying degrees, to all aspects of business. There are five key principles to lean thinking:

- Specify what creates added value as seen from the customer’s perspectives
- Identify all key links and activities across the value chain
- Implement those actions that create and enhance value
- Only make what is pulled by the customer just in time
- Strive for perfection by continually removing successive layers of waste

All activities undertaken by an organisation can be placed in one of the following categories:
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- Value Adding – activities that contribute directly to the satisfaction of customers and therefore generate revenue and profit
- Non-Value Adding - activities that do not directly contribute to either the satisfaction of customers or to profitability
- Necessary Non-Value Adding - activities that have to be done but do not directly contribute to the satisfaction of customers; complying with legislation, for instance, is necessary non-value-adding in that it avoids the costly problems associated with non-compliance (ie. fines, legal fees, bad PR, etc.)

CIPS encourages P&SM professionals to consider these categories when applying lean thinking.

Waste in supply chains

A number of studies have identified the following types of waste in a typical supply chain:

- Transport between processes or organisations
- Defects - called ‘scrap and rework’ in assembly industries and ‘waste and write-offs’ in continuous process industries
- Over-processing - doing work that does not provide value to the customer
- Waiting (or inactivity) - people or parts that are waiting for other activities to complete
- Motion of people or parts within a process without adding value
- Inventory, raw material, work-in-progress or finished goods that are not being worked upon
- Overproducing - making product sooner or in greater quantities than customers require in order to reduce unit costs of production
- Excess production and distribution capacities
- Under-utilisation of the skills of the workforce

It will be noticed that some of these wastes are inter-related; over-production, for example, creates inventory. P&SM professionals will also understand that some ‘waste’ is necessary and cannot be removed (ie. necessary non-value adding). However, understanding the reasons why it is necessary and challenging the underlying assumptions can often lead to creative ways to remove more waste.

CIPS encourages P&SM professionals to bear these examples in mind, but to also think of waste from a wider perspective by applying lean thinking to ensure that all aspects of the value chain are efficient and cost effective.

Although developed by the motor industry, lean thinking can be applied to all types of purchasing organisation irrespective of size, including sectors such as utilities, services and retail. A key manifestation of lean thinking is to analyse the key value chain processes, including internal and external ordering (plan to requisition to payment), and remove any unnecessary steps or processes.

Self-billing for suppliers (where the customer creates invoices on behalf of the supplier) and some parts of eProcurement (such as ordering standard parts via the suppliers systems) are just two examples of areas where lean thinking is commonly applied by P&SM professionals. Simple improvements like consolidating supplier invoices also remove waste by reducing the numbers of invoices and thereby reducing the amount of processing.
One of the key aspects of all P&SM is the sharing of relevant data between buyers and suppliers, and this is particularly valuable in lean P&SM in order to ensure that all waste is identified and removed. To this end, CIPS believes that the ‘Shared Data Environment’ concept, where all data relevant to both parties is made readily available, should be seriously considered when deciding how to make an organisation leaner. As a part of this, P&SM professionals will ensure that both parties’ requirements are carefully detailed in the contract (reference should be made to the CIPS Positions on Practice on writing contracts which are also available on this site).

In a truly lean environment, many activities will be value-adding. Activities to demonstrate good corporate governance and ethical practices, for example, should be determined in conjunction with their direct benefit to the organisation (compliance with legislation, enhanced reputation and prestige, etc.) and the needs of the stakeholders (ethical investment, for instance). Bureaucracy is always to be resisted and avoided.

**Risks of lean thinking**

When organisations become too lean (such as relying on one supplier for a strategically important requirement) problems can arise. For instance, in 2010 the farm and construction equipment maker John Deere had moved towards becoming a make-to-order company, and was losing orders because they were not holding enough stock to fulfil orders in sufficient time to meet their customers’ needs.

Effective risk assessment employed at the appropriate stage in the sourcing process will enable mitigating strategies to be developed and provide greater confidence in the lean approach. Increasingly uncertain global political and environmental conditions mean that supplier source reduction and extended supply chains, and especially single sourcing, are risky; many organisations discovered this when ships stopped using the Suez Canal due to Somalian piracy, or sources of supply disappeared following the tsunami that devastated parts of Japan in 2011. Lean thinking is very appropriate from the supply-side perspective but consideration must always be taken regarding the implications for the customer and the opportunity cost of not being able to respond to a customer need.

Another example of a company suffering from being too lean is Ford who, in 2010, had standardised parts between models of cars. They had to recall 4.5 million cars because a faulty cruise-control deactivation switch was causing vehicle fires. The failure to understand the risk incurred by single sourcing a component on multiple models, brought about by lean thinking, contributed to a huge cost to the company.

Another area where lean thinking may pose a risk is the trend for outsourcing which, in the 1990s in particular, was intended to make organisations leaner by enabling them to concentrate on their core skills. However, in some cases they became too lean and lost their core competencies in the process. Where organisations become de-skilled (and in particular lose their commercial skills) they fail to see market opportunities, or are too lean to respond quickly to such opportunities when they arise.

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1. Singh, Shruti: Low Inventory Angers John Deere Customers, Bloomberg BusinessWeek, April 26th 2010
CIPS believes that P&SM professionals must assess the risk to their organisations in losing core competences and correct the situation by insourcing as appropriate to ensure that the organisation does not become dangerously lean.

CIPS believes that leanness is important for ensuring cost-effectiveness, but it should not add risks which could damage competitiveness or survival. In a largely uncertain world, excessive leanness can be as much of a weakness as carrying excess fat.

**Agility in supply chains**

Agile supply chains allow organisations to react faster to surges in demand and, therefore, beat their competitors to an opportunity.

One way agile supply chains can do this is by holding more stock. For example, Racal Electronics chose to hold inventory for its customers in order to respond on very short lead times; for them the inventory, in this respect, is not a waste as it is a value adding activity to the customer. Although there will have been a cost to Racal in providing the service to the customer, its margin was sufficient to absorb this cost. It is a truism that for some companies to be operating ‘just in time’ it is often true that someone else in the supply chain has to be operating ‘just in case’ (or holding stock).

CIPS believes, therefore, that it is essential that an organisation has a sound and comprehensive picture of its value chain in order to understand where inventories and capacities should be in place, to know which links are most at risk under certain circumstances and to plan where quick responses will be vital in order to see commercial opportunities.

Having an agile supply chain also means that organisations are able to react faster in order to mitigate risks. For example, agile organisations were able to assess and reallocate resources where necessary during the fuel protests in 2000 in the UK, while less agile organisations were unable to. For example, Honda had to stop production at its Swindon plant.

Agile supply chains are also well placed to offer bespoke products with the lead times of mass-produced goods, as they have the capability to respond promptly to the customer’s need. An example of how this can be done is provided by Martin Christopher, who describes ‘delayed configuration’. This is where products are designed “using common platforms, components or modules but where the final assembly or customisation does not take place until the final market destination and/or customer requirement is known”.

**Risks of agile thinking**

The principle risk inherent in agile supply chains is the increased cost when compared to lean supply chains. If the increased cost is not being offset by an increase in sales and profit due to the organisation’s responsiveness, then a leaner system may need to be adopted.

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3 McGuffog, Tom; Evans, Barry; Jordan, Peter; Clarke, Jeremy; Wadsley, Nick & The CILT Value Chain Forum: Value Chain Management: Developing a more valuable and certain future, CILT UK, 2009
An additional risk may be the need to rely on a limited number of suppliers who can provide the necessary goods or services quickly enough that the buying organisation can remain agile. This can put the buying organisation at risk if a supplier fails to provide an acceptable service. However, CIPS advises P&SM professionals to remember that the best supplier is the one that responds to your needs at the most difficult times and does not let you down.

**Lean and agile**

The CIPS’ view is that lean thinking and agility must exist side-by-side in organisations, and many of the underlying tools support both objectives. Organisations should carefully consider their objectives and desired outcomes when deciding which approach to apply where. It is quite possible for departments within an organisation to focus on different approaches, i.e. a lean department and an agile department can coexist within an organisation. It is important to note that these approaches should not consider only the immediate or annual targets, but also through-life costs and profitability.

Organisations and departments which are most looking to cut costs will apply lean philosophies, whilst those that prioritise customer service will use agile approaches. Additionally, the potential damage to the organisation’s reputation and business from a failure in service should also be considered.

P&SM professionals need to understand their organisation’s needs, and recognise the needs of individual departments, and develop a model which reduces costs as much as possible while remaining agile enough to respond to customers’ requirements. It is also essential to evaluate the degree to which all the key participants in the relevant value chains are themselves lean and agile.

**Conclusion**

CIPS believes that P&SM professionals should seriously consider adopting and integrating both lean and agile principles, whilst taking risks into account. The extent to which either or both of these principles should be implemented should be based upon the joint agreement of senior management and the P&SM professional on the needs of their organisation, founded on the organisation’s specified objectives and strategies.