

A Lean Approach to Change Management

Valerie Crute and Andrew Graves
School of Management
University of Bath

February 2000

ABSTRACT

Many change initiatives succeed in capturing time, attention and energy but fail to produce tangible results. UK aerospace companies are currently endeavoring to improve performance through the adoption of the lean manufacturing philosophy, developed in the automotive industry by Toyota. There is evidence that a lean approach has achieved dramatic rewards for companies who have successfully made the transition. However, a number of questions remain concerning the issue of how to manage the change to lean production. The approach taken to change management could make the difference between achieving real outcomes or simply going through the rituals of the latest change programme.

This paper examines the challenges faced and options available in implementing lean production. Using insights from the available literature on lean transition and organisational change, a framework for change management is presented which advocates a lean approach to change.

KEY WORDS

Change management; organisational change; incremental change; lean manufacturing; lean principles and practices; just-in-time

AUTHOR NOTES

Dr. Valerie Crute is a Research Fellow with the UK Lean Aerospace Initiative (UK LAI) and is based in the School of Management at the University of Bath. Valerie is heading up research in the area of change management within the UK aerospace industry. She formerly lectured at the University of Ulster before spending seven years as a management consultant specialising in change management across a variety of sectors.

Professor Andrew Graves directs lean and agile research efforts at the University of Bath, including the UK Lean Aerospace Initiative (UK LAI) which forms part of a consortium with three other leading UK universities. There is close collaboration with MIT's US LAI. Professor Graves also currently co-directs MIT's International Motor Vehicle Programme (IMVP) and the 3-Day Car Programme and directs the Agile Construction Initiative (ACI). The major focus of these projects is the close working relationship between the industrial partners and the research teams to enable the sourcing of current and valid data for analysis and dissemination in the search towards a more lean and agile manufacturing process within the respective industries.

Challenges faced in Lean Implementation

. *‘Transforming a traditional company into a lean enterprise is considerably more difficult than starting one from scratch’* (1).

Research undertaken by the UK Lean Aerospace Initiative (UKLAI)¹ has indicated that many UK aerospace companies are in the process of adopting the lean manufacturing philosophy, developed in the automotive industry by Toyota. Lean principles are widely recognised to have implications for all aspects of a company and supply chain relations (2-4). Such wide-ranging changes can present a considerable challenge for established companies. As Karlsson and Ahlstrom point out, traditional ways of thinking and practices are difficult to shed and *‘we can thus expect such a radical change to be fraught with difficulties* (5).

Information and training are available on lean tools, techniques and thinking and evidence exists that some companies are achieving dramatic results from the transition to lean (5-7). However, organisations face a broad range of challenges in the move to lean production. Are our people ready? Do they have an understanding of lean principles and practices? Have shop-floor employees got the right skills to enable problem solving, quality assurance, and team-working? Do team leaders and managers have the necessary facilitation, coaching and leadership skills to manage the transition to lean? Additionally, the company infrastructure, including structure, reporting systems, performance metrics,

¹ The UK Lean Aerospace Initiative (UK LAI) is a part of the SBAC Competitiveness Challenge (CC) which has set out to support member companies in meeting their improvement objectives. This is being delivered under programme management from the Society of British Aerospace Companies (SBAC) and supported by a leading University group consisting of Warwick, Bath, Cranfield and Nottingham. Funding for this programme has been provided by EPSRC through the IMI Aerospace Manufacture Programme and SBAC member companies.

and reward systems may not support lean production principles. Making changes in any of these areas may lead to considerable resistance. *‘Every department, indeed every function within an established organisation, represents somebody’s turf, a principality that is likely to be defended’* (1). Any attempt to change the status quo may face resistance within a company where power is structured around functional groups.

Companies also face the challenge of establishing a culture, which is conducive to lean thinking. Many managers in the aerospace sector recognise that their company culture does not promote such factors as continuous improvement, team-working and ‘empowered’ employees. A further challenge lies in gaining commitment within the organisation for change. Gaining senior management commitment to change is crucial in order to have the authority, resources and political backing for major change. Other stakeholders also play an important part in creating a climate in which change is possible. Customers’ can be a powerful ally in both demanding and supporting change, while shareholders can similarly apply both constructive and destructive pressures on change efforts. Employees can resist changes, sabotaging any efforts to improve an organisation. All of this before we go outside of the organisation to ask whether suppliers will be able to meet the needs of a lean organisation in terms of just in time supplying and contributing to the achievement of product and process development.

Lean thinking also provides many challenges to the thinking and experience of the managers who are tasked with its implementation. After many years immersed in traditional manufacturing, managers may feel unfamiliar and uncomfortable with a lean

philosophy (1). Managers have seen many change initiatives come and go with often disappointing results. Faced with all of these areas which need to be changed and a history of failed improvement ‘fads’, managers understandably feel daunted. Meanwhile, companies are busy addressing current customer demands and problems. There must, therefore, be the temptation to put off making changes until ‘we are less busy, have fewer problems, have clearer idea of where we are going’. The business environment makes huge demands for improved quality, delivery, cost, service and shareholder benefit. Lean production offers useful thinking and practices to meet these needs but given the challenges, where do you start?

The Right Change Management Strategy for Lean Transition

Faced with the challenges of making the transition to lean, the question arises of where to focus your change efforts. There are a number of change management strategies, which may be appropriate. Recognising the gap between the current culture and a culture which promotes lean thinking and continuous improvement, companies may choose to focus on culture change. Alternatively, senior managers may decide that the company needs major, company-wide or revolutionary change. In such circumstances a major change initiative is launched usually accompanied by company wide training and communication sessions. Another change management strategy involves incremental change with targeted results and short time-scales. In the sections which follow each option is discussed and while the transition to lean is likely have a revolutionary impact on the business, an incremental approach is recommended as the right strategy for lean transition.

Do we focus on culture change?

The 80's and early 90's have seen the rise of initiatives designed to change organisations by focussing on culture. Proponents of this approach have included eminent management 'gurus' (8, 9). Companies' were encouraged to create a culture which would be customer-focussed, innovative and empowered. The assumption was made that culture can be controlled and changed by senior managers. Many theorists have since questioned this assumption, arguing that while the culture of organizations can and does change, such changes can not be directed and controlled by managers (10, 11). Some writers highlight the potential dangers in attempting to change culture, noting that such efforts can have unintended consequences. They further contend that efforts to change culture *'frequently degenerate to changes in behaviour, leaving higher levels of culture untouched'* (10).

It would seem that aerospace companies might be successful in changing culture under certain particular circumstances, when other major changes are taking place. These situations include when there is a significant change in leadership, a new plant or green field site (12). Major crises are also suggested to support the generation of new cultures. In such conditions, people need to think differently and firmly held beliefs and certainties are shaken. However, *'the danger is that once the crises subsides practices and norms may return to 'normal' in the absence of some basic and well-grounded changes in place'*(10).

Therefore, while there is evidence that culture will begin to change during the transition to lean (13, 14), it would seem unwise to focus specifically on culture as a change management strategy for the transition to lean.

Revolutionary or incremental change?

Lean thinking challenges in a revolutionary way much of the traditional ‘common sense’ and experience in running a business (15). It is understandable, therefore, that many managers see the need for revolutionary change throughout their businesses. Such change efforts typically include company wide efforts to introduce new thinking and practices. The transition to lean could become the latest ‘large-scale company change programme’.

Revolutionary change can be described as

- seeking comprehensive or organization-wide solutions
- focusing primarily on activities such as training, reorganization, team building, human resource policies or systems, or abstractions such as culture, empowerment, learning, or management styles
- involving changing multiple elements all at once
- typically requiring long lead times with the promise of results in the future (16)

Large-scale programmes for implementing change have been popular in recent years. They have included total quality management, business process reengineering, and various forms of employee involvement or empowerment programmes. Such

programmes are appealing for a number of reasons including: the fact that they are already designed; they represent success stories by others and are therefore legitimate; and they can be delegated to consultants to implement (17).

Cohen considers such programmes to be *'high- risk endeavours that tend not to produce business results'* (16). He cites several studies which report a low success rate for many large-scale 'change' programmes. A 1991 survey of 300 electronics companies indicated that while 85% reported quality programmes underway, less than one third had achieved any significant or positive result. A later study found that two thirds of quality programmes failed to yield any real improvements. The study noted that *'companies try too much, wasting money on broad based training and new technology that does not relate to immediate problems'* (18). Business Process Re-engineering change initiatives seem to show a similar pattern. A study reporting on the re-engineering projects within 100 companies, found that while there was some process improvement, little if any gain was demonstrated in business results (19). In contrast, Cohen praises the lean manufacturing approach for the emphasis given to targeting tangible results (such as reduction in inventory, improvements in delivery cycle times). However, this benefit might be lost if companies adopt a revolutionary, large-scale programme approach for the transition to lean.

Lean production certainly has the potential to be approached as yet another large-scale 'change programme' if introduced as a company wide panacea. Lean manufacturing could be a *'program-lover's dream: a proven system with lots of elements to organise'*

(20). Rother warns against taking this approach and instead advocates concentrating on change targeted on improving the flow within specific product value streams. Indeed, industry participants at workshops organised by the UKLAI have observed that there is ‘initiative fatigue’ among their employees. Introducing lean manufacturing as another ‘major change initiative’ might, therefore, generate greater employee resistance. The popularity of large-scale change initiatives in recent years, probably means that managers have more experience in launching major change programmes than in implementing lean practices in their workplace. This relative lack of experience in lean implementation is a further reason for taking an incremental approach to change.

Incremental change – The right strategy for lean transition?

Adopting a revolutionary approach to lean transition through a company-wide programme is high risk and could be ineffective in producing tangible results. An incremental approach to change may therefore be a more appropriate strategy for lean implementation. While company-wide change programmes seek comprehensive solutions, an incremental approach involves a more targeted change effort for a specific situation. This strategy can be described as ‘*lower risk, focusing on results, involving a more limited number of variables and requiring shorter time frames*’ (16). In terms of lean implementation this often means using a pilot or ‘model line’ approach to create a lean system for a particular product or product family (7). This process can begin by identifying and improving a product value stream within a particular plant (21). Improving areas outside the plant, in the supply chain, can be undertaken incrementally once a lean system has been created internally. Other product lines and areas then form

the focus for further incremental changes, as the need and relevance of lean thinking is recognised and as experience in lean manufacturing grows.

An incremental approach is recommended as a change management strategy for the transition to lean for the following reasons.

- **Visible results in short time scales**

An incremental approach targets activities which will achieve results in the short-term and have an immediate benefit for the customer and the business (22). In contrast with large-scale programmes which tend to expect tangible results after several years, incremental changes are designed to create results within 60 –90 days. Proponents of lean will suggest, based on experience, that within a short period of months it is possible to see dramatic improvements in quality, productivity, delivery performance and space utilisation (1). This targeted approach is helpful in gaining senior managers' commitment to change. Results achieved on a pilot line also help to generate confidence in lean ways of working for those involved in the changes.

- **Less risk/ less anxiety / less resistance**

Lean thinking challenges traditional ways of operating a business. The changes are difficult because *'few in the organisation, if any, have a vision of what the lean production workplace will be like, since they have never been there.'*(15). Company wide initiatives are 'high risk' endeavors and highly visible (16). Using an incremental approach, may generate less anxiety among managers, and result in less

resistance with consequently a greater willingness to take action. It would seem to make sense to introduce and develop such practices in ways that make it less anxiety provoking for managers and staff.

- **Experimenting and building experience**

Finally, an incremental approach enables the building of experience in lean thinking and practices and the testing and adapting of ideas. It has been argued that lean concepts can be taught in one day but *'you really only learn how to apply the principles by going out to the factory and working in a small area for a week or more to apply one of the principles. This learning experience then has to be repeated over and over... to give you the personal experiences that eventually culminate in a belief in the new principles deep down in your gut'* (15). This approach of experimenting and building experience has been described as a fundamental component of the Toyota Production System (23), and builds understanding of how lean ideas can apply in specific company situations.

The Right Focus for Incremental Changes – A Lean Value Stream

‘The process of change should be invisible to customers, but the results should be very apparent and very positive’ (24).

Product or Service Value Streams

Too many change initiatives seem to result in inconvenience for the customer, often without any payoff in terms of improved performance when the dust of change has settled. However, a lean approach to change keeps the focus firmly on improving the delivery of value to the customer.

An important feature of the lean manufacturing philosophy is the focus on product value streams as the target for change rather than functional areas or infrastructure. The value stream is the process involved in producing a product or service (6). Recent business ‘improvement’ initiatives have focused on such factors as empowerment, delayering and restructuring, and have made the assumption that making such changes will impact on the delivery of value to the customer. *‘Boxes are moved around... teams are ceremoniously launched, layers are removed, support services are consolidated or distributed, but the fundamental capacity of the organisation remains unchanged’ (25).* The strength of the lean approach is that it focuses directly on identifying and improving the flow of value to the customer (6). Changes have focussed on creating a lean system for specific products or product families with a view to eliminating waste and improving quality, responsiveness and ultimately cost of delivery to the customer.

With many large-scale initiatives the spotlight for change is directed from the top of the organisation by senior managers, down through the organisation highlighting most intensely the problems of structure and infrastructure. The light is weakest as it reaches the base of the organisation where the delivery of value takes place (see *figure 1*). Often attention and resources are drawn from this area to create change teams, attend training, and/or generate complex new systems. The attention of managers and staff is also directed internally, upward through the organisation to the instigators of change and consequently away from the flow of value to the customer. By contrast in implementing lean manufacturing, the spotlight is directed along a particular value stream from the perspective of the customer. This highlights and draws attention to performance improvement in areas which directly affect delivery of value to the customer. Other aspects of organisational infrastructure are more weakly highlighted and only addressed from the point of view of improving quality, flow and ultimately cost in target value stream.

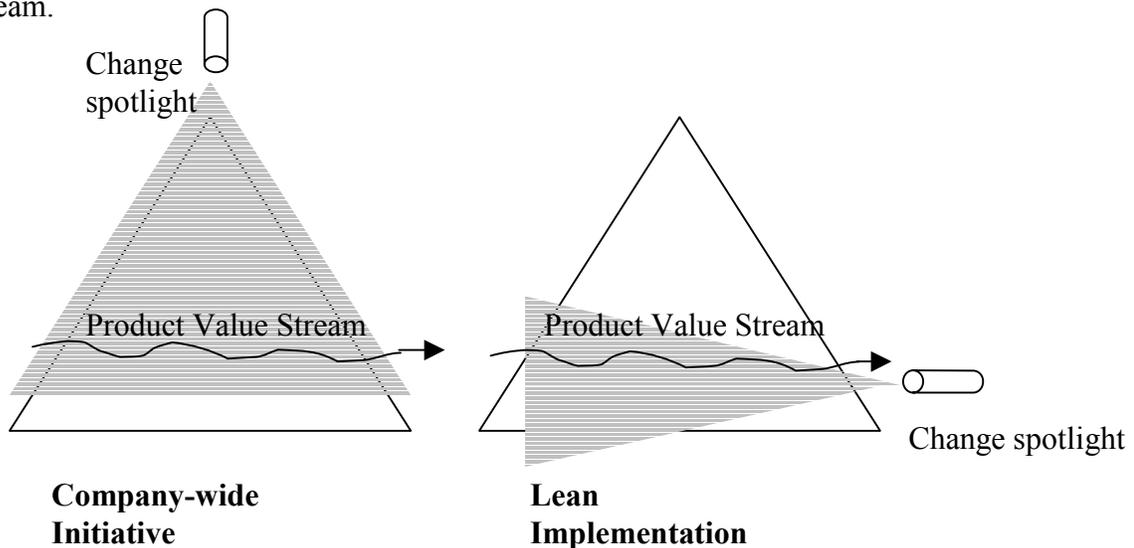


Figure 1: Areas Highlighted by Company-wide and Lean Change Initiatives

Functional areas such as engineering, procurement and finance may have a considerable impact on the delivery of value to the final customer. Lean principles can usefully be applied in such areas. However, the question again arises concerning how to implement such changes. Following the arguments in the paper, change would most productively be made incrementally and focused on specific value streams rather than attempting a 'department-wide programme' for lean introduction.

Creating a Lean System

A second characteristic of a lean approach to change is the focus on creating a 'lean system' for a product value stream - a holistic rather than piecemeal approach. Many companies have wrongly engaged in 'cherry picking' of the techniques observed in Toyota (20). From visits to the company, it will have been easier to observe error-proofing techniques, short changeovers and people working as teams but less easy to see the objective which all of these activities were designed to address. As Rother points out, *'lacking the overriding goal, the techniques became our goal and we ended up cherry picking'*. While adopting lean techniques may be useful as an introduction to lean thinking, some writers caution strongly against such an approach since this often leads to missing the key principles of lean production (23). *'The 'techniques first' approach tends to foster misunderstanding of what lean production really is, and resentment among the employees who are pushed into activities that generate little or no measurable improvement... a better way to ease the lean transition is to pick a pilot product line and work to change that one flow to a lean system'* (20).

The principle of establishing a whole system is in keeping with the lean concept of ‘single piece flow’. Each change is brought to a completed stage within a short period of months rather than years. Too often companies introduce many changes simultaneously, which all remain in a partially completed state rather than introducing and finishing single initiatives. Once the lean system has been established for a product value stream, all subsequent changes represent continuous improvement efforts. By creating a lean system in one value stream, valuable lessons can be learned and applied to other areas of the business.

The Right Time for Change – ‘Just in Time’

The timing of changes would also seem to be an important consideration in a lean approach to change – when is the right time to introduce various changes? Company-wide change programmes often change many broad variables simultaneously (22). The approach advocated thus far in this paper has been an incremental strategy, with the emphasis on introducing lean production in a pilot product value stream and then broadening to other product value streams. This stresses the need for sequential change. Importantly, in keeping with lean principles, the changes should be ‘pulled’ as needed rather than introduced and ‘pushed’ through the system even though they may not be needed until a later stage. Within the pilot or model line, lean techniques would be introduced when they are needed to achieve smoother flow, to eliminate waste or improve quality. In other words, the techniques are pulled into use when needed.

This approach of 'just in time' change would apply equally to deciding when to introduce changes in structure and infrastructure. A number of factors are likely to influence the successful implementation of lean production including, for example, having a product based structure, and having feedback and reward systems at unit and individual level which support a lean approach. However the question arises concerning when to make changes in these areas. It might be argued that lean manufacturing should only be introduced after the preparatory work in changing structure and infrastructure. However, many writers highlight the dangers of focussing first on infrastructure (1, 7, 16). Too many change programmes '*confuse building infrastructure with generating results*' (16). Such programmes create a focus on intermediate or abstract variables rather than variables such as reducing work-in-process inventory, cutting lead time, and decreasing scrap, which will produce results. Organizational structure, roles, measurement, reward systems, training, team building, empowerment and learning are all elements that make up a company's infrastructure and are all important in achieving lean production. The assumption, Cohen suggests, is that if enough of the right support elements are put into place, then results will follow. '*Nothing could be further from reality. Whereas support elements may sustain or reinforce results once achieved, they do not produce business outcomes. Generating results requires a direct attack on causal variables - ones that will actually improve performance. In the absence of results, however, building infrastructure is a dangerous distraction and can subordinate the performance improvement agenda to ancillary concerns*' (16).

As a general rule, therefore, it would seem that major infrastructure changes would be more appropriately undertaken after the creation of a lean system for a specific product stream. In this way the system can be designed to support the new ways of working. Designing major systems such as recruitment, appraisal or reward systems any earlier may be premature. In some circumstances, however, it will be necessary to create new systems at an early stage of implementing lean production. Karlsson and Ahlstrom describe an interesting illustration in a case study which explores the role of the remuneration system in the implementation of lean production (13). In this situation, the existing remuneration system rewarded piece-work, creating major motivational problems when introducing a lean system producing only 'what was needed, when it was needed'. It was necessary at an early stage to design a new remuneration system to enable the lean ideas to be accepted and acted upon. They emphasise, however, that the system was developed rapidly and would need improvement but stressed that it would be unwise to give much time to this until the new lean system had settled. The new remuneration system had a number of positive effects including the following '*interest in quality issues increased... Workers no longer tolerated defective parts and tried to take measures to correct the parts, which were defective. Furthermore, workers no longer tolerated missing parts, since this made it impossible for them to deliver products on time*'. Clearly, there will be times when elements of structure and infrastructure will actively hinder lean implementation and will consequently require early attention.

A related problem in timing can be procrastinating or delaying too long in making changes. There is a tendency for some companies to remain in a "we're getting ready for

lean transformation” line of thinking (20). The companies focus on preparatory work in process capability or reducing set-up times, as a prerequisite for lean manufacturing. But there is then little pressure to take the change process further. Rother contrasts this with companies who identify and improve product flow. When inventory is reduced, flow problems become apparent and there is an urgent need to resolve them. *‘To manage change, you sometimes have to ‘just do it’ and then deal with the consequences’* (15).

The Right Quantity of Change

A final characteristic of a lean approach to change relates to the amount of change taking place within the organisation. In any one organisation there will be a great many changes underway, some planned and others in response problems or circumstances. A variety of corporate initiatives, departmental drives and team generated ‘improvements’ often conflict in their suggestions for ‘the way forward’ and vie for attention and resources. *‘This is like researching a cure for a disease by giving a group of patients ten different new drugs at the same time’* (22). It becomes virtually impossible to tell which initiatives, if any, might be leading to improved business performance. A lean approach to change might be characterised by less change and a clearer and stronger connection in the changes being managed.

Lots of change efforts in organisations could be described as ‘work in progress’. The changes have been launched and are at various stages of progress or neglect throughout the system. Just as high inventory levels mask problems in manufacturing, a similar process occurs in change initiatives where too many change programmes are operating at

once. It becomes difficult to know what is having the impact, what to do more of, or indeed, if anything is having any impact given that staff are spending energy participating in or coping with the latest change initiatives. A lean approach to change would involve eliminating initiatives, which do not add value by directly improving the flow of quality goods or services to the customer.

Change has an emotional impact on managers and other staff. Individuals experience a sense of loss when they are undergoing significant changes in work. *‘One of the management’s imperatives is to keep the proportion of the organisation that is feeling this sense of loss to less than one third of the organisation, while still moving rapidly to improve the organisation’s competitiveness’* (15). This reinforces the need to adopt an incremental strategy in implementing lean. *‘In effecting change, a law of wing walking always applies: Never let go of something until you have hold of something else’* (24).

Summary: A Lean Approach to Change

‘Practice what you preach’

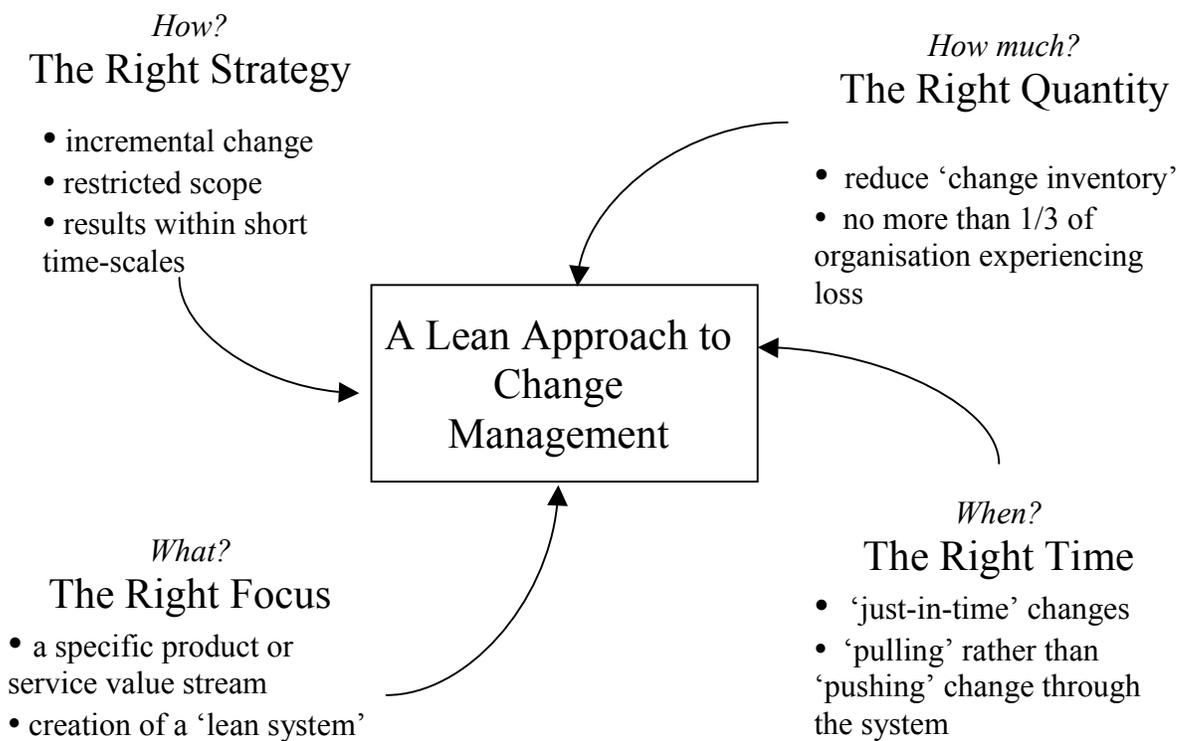
Many change initiatives succeed in capturing time, attention and energy but fail to produce tangible results. There is evidence, however, that lean principles and practices have achieved dramatic rewards in companies who have successfully made the transition. For UK aerospace companies who are currently endeavoring to improve performance through the adoption of lean manufacturing, the approach taken in managing this significant change could be crucial in delivering results.

This paper examines available change management strategies to identify an approach which has the potential to create results and which is congruent with lean principles (5) (see *figure 2*). Incremental change is suggested as the right strategy for lean transition. This approach involves making changes within identified areas over short time-scales and gradually extending the areas of lean production. Two further aspects of a lean approach to change are stressed, namely, focussing improvement efforts on product value streams, and the establishment within the value streams of a holistic lean system. The focus on value streams ensures that changes address customer needs. In addition to the right strategy and focus for change, the report also discusses the right time for change to be introduced. ‘Just in time’ change is advocated rather than the more usual practice of pushing change whether or not this is required by the upstream customer. Finally, a ‘lean’ approach to change management cautions against introducing too much change into the system.

The approach advocated in this paper for managing the transition to lean manufacturing, requires managers to ‘practice what they preach’ by applying lean principles in their change management efforts. This approach might also be beneficial in meeting the wider challenge of integrating improvement efforts across the supply chain. Recent literature on the transition to lean has provided learning from case studies of companies in various sectors who have adopted lean thinking within their own plants. Less attention, however, has been given to assessing the impact of lean thinking across the wider value stream incorporating several companies in the supply chain. A lean approach to such changes could follow the same guidelines, by targeting specific product value streams and piloting

a lean philosophy within the companies involved in this value stream. Further research at company and supply chain level will be needed to identify the approach used and results achieved within aerospace companies implementing lean principles and to assess the extent to which a ‘lean approach to change’ has been adopted.

Figure 2: A Lean Approach to Change Management



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