SCOTTISH EXECUTIVE

Evaluation of the Lean Approach to Business Management and Its Use in the Public Sector

Office of Chief Researcher

EVALUATION OF THE LEAN APPROACH TO BUSINESS MANAGEMENT AND ITS USE IN THE PUBLIC SECTOR

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Weir Pumps PLC

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Lean thinking has its roots in the Toyota production system, and has been developed in the manufacturing sector. Womack and Jones (1996) highlight five core principles to define Lean thinking as a means for understanding value (Womack, 2002):

- Specify the value desired by the customer
- Identify the value stream for each product or service providing that value and challenge all of the wasted steps
- Make the product or service flow continuously
- Introduce pull between all steps where continuous flow is impossible
- Manage toward perfection so that the number of steps and the amount of time and information needed to serve the customer continually falls.

A toolkit of methods for practical use at the operational level has been developed to support lean thinking. Tools include, for example, value stream mapping Tools include, for example, value stream mapping which is used to analyse the flow of resources, highlight areas where activities consume resources but do not add value from the customer's perspective. This map is used to generate ideas for process redesign.

Although applied successfully in the private sector, especially in manufacturing, the approach is less frequently applied in the public sector, and little research has evaluated whether the lean approach transfers successfully and what impact this has had on productivity and/or quality of service.

Methods

This research aimed to evaluate the application of Lean in the public sector to consider if it is an appropriate means to embed a culture of continuous improvement. The research consisted of a literature review; case studies of eight public sector organisations, predominantly based in Scotland; a survey of Scottish-based public sector organisations who believed they were implementing aspects of 'Lean'; and an evaluation of the implementation and impact of a Lean methodology in three pilot sites.

Lean in the Scottish public sector: Working definition of Lean

The research found a key difference between Lean in the public service sector and that used in manufacturing. In manufacturing, the emphasis is on a set of management tools and techniques that are used to standardise processes. Within the public sector, however, there is engagement with the principles of Lean, but less with the full range of tools and techniques. Most organisations, for example, used just a few tools, such as value stream mapping.

This implies that many of the tools and techniques used in a manufacturing context are currently not immediately and obviously applicable to service environments. Instead, some of the tools need to be adapted to cope with the need for greater process flexibility that are

found in the public sector to meet the needs of the customer. In some cases, the limited range of Lean tools in use in the public sector may be because the service sector has yet to understand the value, relevance or purpose of the tools being applied from within the toolkit.

Lean in the Scottish public sector: Implementation approaches

Two models of Lean implementation are used in the public sector, and can be described as Full Implementation of the philosophy and the use of Rapid Improvement Events. Examples of Full Implementation, which is considered to be embedding of Lean principles and broad use of different Lean tools including the use of Rapid Improvement Events, are more difficult to identify in the public sector. This approach aligns improvement to strategy taking a whole systems perspective.

Most case study sites use a Kaizen approach, often described as a 'Kaizen Blitz' or 'Rapid Improvement Event (RIE)'. The RIE approach uses rapid improvement workshops to make small, quickly introduced changes. Rapid Improvement has three phases. It begins with a 2-3 week preparation period, followed by a 5-day event to identify changes required and a 3-4 week follow up period after each event when changes are implemented.

An advantage of the RIE found in this research was that public sector managers found its style of delivery could overcome slow responses by staff to change initiatives. Line managers argued that it provided a faster return for effort, was more visible and did not challenge existing management control styles to the same extent as Full Implementation. It was also favoured by staff as they felt engaged in an improvement process that quickly demonstrated potential results where they had some input. However, the disadvantage of the RIE was that 'quick wins' may be difficult to sustain because they are not easily integrated into the overall strategy of the organisation which would be more likely to lead to longer term continuous improvement. The Full Implementation model, on the other hand, has the advantage of linking improvement to overall strategy which, as will be shown, was found to be advantageous in Lean implementation.

Outcomes from Lean implementation

The test for any new management concept is whether or not the outcomes of the approach are sufficient to justify the cost and effort of implementation. All case and pilot sites, as well as survey respondents, reported some improvements, but most sites had not achieved all the objectives they had hoped from the Lean project. The research found two types of outcomes from lean: tangible and intangible, the former referring to measurable outcomes, and the latter referring to more qualitative outcomes.

There was a wide range of tangible outcomes reported, including:

- Improving customer waiting times to first appointment in the health sector from an average 23 to 12 days
- Improving service performance in failure demand from 82% to 15% in four weeks
- Improving processing times by two thirds in one local government department
- Achieving more work in less staff time
- Bringing services up to a standard

- Improvement of customer flow time for patients of 48%.
- Reduction in staffing and costs of 105 person reduction in manpower and £31m budget saving in 10 months.

There was also a range of intangible outcomes delivering benefits to the customer, the organisation and the staff which can be summarised as:

- Process change to speed up the process
- Culture change to focus on customer requirements and encourage joined-up working
- Greater focus on prevention rather than correction of errors
- Support for the development of a culture of continuous improvement
- Greater understanding of the whole system and how it fits together
- Better understanding of the needs of the customer
- Improved performance measurement and use of data to manage performance
- Greater staff satisfaction and confidence in themselves and the organisation.

In sum, the research found that Lean can drive efficiency improvements but cannot necessarily be used for the primary purpose of making cash savings in particular through reductions in staff numbers.

In considering why change has occurred to a greater or lesser extent, the research highlights several factors that inhibit change from happening. These factors relate closely to pre-existing evidence from the manufacturing sector, and include:

- Lack of resources to implement changes
- Resistance to change from staff and management
- Post RIE/ Blitz week lack of ownership for the improvement activity
- Lack of management and staff commitment throughout the change process
- Slow natural pace of change in the public sector

Irrespective of the Lean model used, therefore, these findings suggest that organisational and cultural factors shape the degree of success of Lean.

In most cases, improvement initiatives had not been integral to organisational strategy. This apparent weak link between strategy and improvement had not impacted the outcomes of Lean, as successes were found across all sites, but it was felt that this may not be sustained in the longer term as organisations become more process focused and need to more clearly allocate resources to improvement activities. This implies that a more sustained and effective Lean application would link strategy and operational improvement in a whole systems approach.

The research found that organisations who are more engaged with Lean and had considered and planned for it are ready to embrace Lean improvements. The results suggest that the organisations with a history of managing change, that had previously tackled process change and are able to build effective, multi-disciplinary teams to work across traditional organisational barriers are those with the greatest capacity for Lean improvement.

In terms of more sustained improvements, however, other factors are also relevant to understanding the degrees of success of Lean. The research suggests that a critical mass of people who are comfortable working with Lean practices is required. In the short-term this

requires behaviour change and those using the tools and techniques need to be trained in Lean. In the longer term, skills transfer, especially from consultants to employees, from those involved in the RIE to those needing to implement change, is a key factor in sustainability, and strong leadership and communication of the changes are the main ways through which people become skilled and engaged and add to the critical mass.

Success factors in implementing Lean

The evidence uncovered a wide range of factors related to the successful implementation of Lean in the public sector. These are:

- Organisational culture and ownership
- Developing organisational readiness
- Management commitment and capability
- Providing adequate resources to support change
- External support from consultants in the first instance
- Effective communication and engagement through the organisation
- Strategic approach to improvements
- Teamwork and joined-up whole systems thinking
- Timing to set realistic timescales for change and to make effective use of commitments and enthusiasm for change

Organisational culture is an important success factor, with a need to ensure that all staff are willing to take on board the initiative and to gain a sense of ownership. The case sites and pilot studies both demonstrated that a key challenge during the early stages of a Lean implementation was to engage all staff in the process as quickly as possible. By engaging staff, they become motivated in their work and in making changes to the process. In addition, the experience of participating in a process improvement initiative changes people's attitudes to the concept of change and prepares them for a future culture of continuous improvement.

Organisational readiness is a key factor in the success of Lean. This includes generating a vision of a fully integrated Lean organisation at the outset of implementation; being realistic about the timescales involved in making changes and embedding the process; engaging staff and helping them to understand how the Lean approach may impact upon the organisation and; evaluating the degree to which a process and customer view already exist within the organisation.

Management commitment to the improvement events is a key element of the implementation. The survey, for example, found that managerial commitment to ongoing improvement was the most important factor contributing to the success of the Lean projects. However, this also requires making provision for supporting changes, including staff time for the duration of the preparation meetings and RIE and financial resources for any changes recommended.

The research found that external support, often through management consultants, is effective and even necessary for implementing lean. However, it was agreed that consultants should provide a skills transfer function so that investment in consultancy will lead to wider gains within an organisation. In one case, for example, the organisation had become dependent

upon consultants as skills transfer had not taken place, resulting in a much larger investment in Lean consultancy than originally foreseen.

Good communication is also important to ensure Lean is implemented effectively. Good communication during a Lean implementation has a number of benefits, including recognition of employee effort; maintenance of the momentum for change, sharing knowledge across work streams or departments, and generating buy-in from other staff not involved in the RIE process. In a poorly communicated Lean implementation, the initial enthusiasm for Lean may quickly diminish, while other staff not directly involved in the RIE may remain disengaged, resulting in a reduction in improvement activity and a consequent lack of sustainability of the changes made.

Taking a strategic approach to improvements can also help to generate this vision of Lean as having broader impacts upon the organisation. The research found that by aligning Lean to more strategic aims of the business more sustainable wins are made and commitment from staff to the change process is enhanced.

Team working is an important, even critical, aspect of the Lean approach as well as other change or improvement activities. The constitution of teams is important to generate both buy-in from the participants and the staff who are involved in the process under review. It was reported that team work allowed organisations to generate capacity for improvement, it helped to reduce the hierarchical boundaries between staff where improvements were required, and developed a sense of joined-up working in a whole system.

Finally, it is important to set realistic timescales for change so that expectations are set. Timing is also important for building on the momentum for change generated by improvement events as delays can impede implementation.

In contrast, the research identified a wide range of barriers to successful improvement programmes, including:

- People resisting change
- Lack of ownership
- Poor selection of improvement team members
- Failure of leadership to drive change
- Compartmentalisation or silo working
- Weak link between improvement programmes and strategy
- Lack of resources to support the programme and the changes
- Poor communication of change initiatives throughout the organisation

Conclusions: Implementing Lean in the Public Sector

Analysis from the research with organisations in the Scottish public sector, together with evidence from the literature, indicates that Lean is transferable to the public sector and can be used to develop more seamless processes, improve flow, reduce waste and develop an understanding of customer value. Lean is most suited to organisations with high volume, repeatable tasks that allow greater standardisation and integration, supported by a less hierarchical management structure that allows empowerment and engagement of the workforce. However, to ensure greater successes, organisations require an awareness or realisation of the need for improvement; the capacity within the organisation to deal with

change; and an organisational culture which is receptive to understanding the customer and process analysis and is able to use relevant data to drive improvement.

For longer-term impact and sustainability, implementation of lean should be tied to more strategic objectives. By tackling the barriers and ensuring the provision of the factors contributing to success, this research finds that Lean is a suitable methodology for improving performance and embedding a continuous improvement culture in the public sector.

CHAPTER ONE INTRODUCTION

A. Introduction

1.1 This report presents the research that was undertaken by Warwick Business School commissioned by the Scottish Executive in order to evaluate the Lean approach to business management and its use in the public sector. The research project commenced in August 2005 and was completed in March 2006.

1.2 Broadly the project aimed to **evaluate** the application of **Lean** in the public sector in order to consider if it is an appropriate means to **enhance** the future **embedding** of a **continuous improvement culture**.

1.3 More specifically, the evaluation hoped to achieve the following objectives:

- To develop a clear understanding of the philosophy, relevance and components of Lean related to the public sector.
- To indicate if particular tools, techniques and components of Lean are more appropriate for public sector use across different services.
- To give an assessment of the level of improved productivity and quality that can be expected through the introduction of Lean
- To give recommendations and suggestions about how to establish and implement Lean across Scotland's Public Services.
- To give an understanding of the organisational implementation issues of such a major change programme

1.4 By meeting the aim and objectives it is then possible to answer the following questions:

- Can Lean work in the public sector?
- How can Lean work?
- Can Lean be replicated?
- Can Lean embed a culture of continuous improvement?

1.5 The research consisted of a literature review, case studies of public sector organisations in Scotland who believed they were implementing aspects of 'Lean', a survey and an evaluation of pilots of a Lean methodology which had been developed by the Scottish Executive (see 2.18-2.22).

1.6 The focus of this report is to present the findings from the case studies and pilot studies, drawing on some evidence from the literature review (Annex 1) and survey (Annex 2) where relevant.

1.7 The report is divided into eight chapters.

- *Chapter 1, Introduction*, introduces the research aims and objectives. It also outlines the concept of Lean, focussing particularly on its relevance to the public sector.

- *Chapter 2, The Research,* sets out the data and information sources and methods of data collection and analysis employed. It presents some detail on the case studies and pilot sites who took part in the research.

- *Chapter 3, Perceptions of Lean,* presents the various views from research participants in terms of Lean's origins, its definition, approach and elements.

- *Chapter 4, Implementation of Lean*, describes the processes taken by the case studies and pilot sites in order to implement Lean.

- *Chapter 5, Outcomes of Lean,* examines both the tangible and intangible outcomes reported as a consequence of Lean. This chapter also reflects on the issues that led to failed implementation of changes as well as factors that support sustainability.

- *Chapter 6, Contextual Factors and Organisational Strategy,* evaluates both the internal and external factors and drivers that can influence an organisation's decision to engage in an improvement programme such as Lean. The issue of strategy is also examined as it is a key driver for linking Lean to effective improvement.

- *Chapter 7, Organisational Readiness for Improvement,* presents factors which affect the ability of an organisation to implement an effective improvement programme. These findings were found to be particularly critical in terms of the Scottish public sector's ability to engage in Lean and continuous improvement.

- *Chapter 8, Summary of Research Findings,* draws together the key findings in order to present the success factors and barriers in implementing Lean. The chapter also summarises the findings in reference to the four key questions (see 1.4).

B. Overview of the Lean Concept

1.8 This section will introduce briefly the concept of Lean. More detail on the history, application and components of Lean can be found in the literature review (annex 1). However, to aid the reader through this report some key terms and definitions can be found in the glossary in appendix 1 of this report.

1.9 There are many views of what constitutes "Lean thinking" or "Lean production". Although most people recognise the roots of Lean thinking in the Toyota production system (Monden, 1983), there has been considerable development of the concept over time. Womack and Jones (1996) are regarded by most as the originators of the term. They developed five core principles to represent Lean (Womack, 2002):

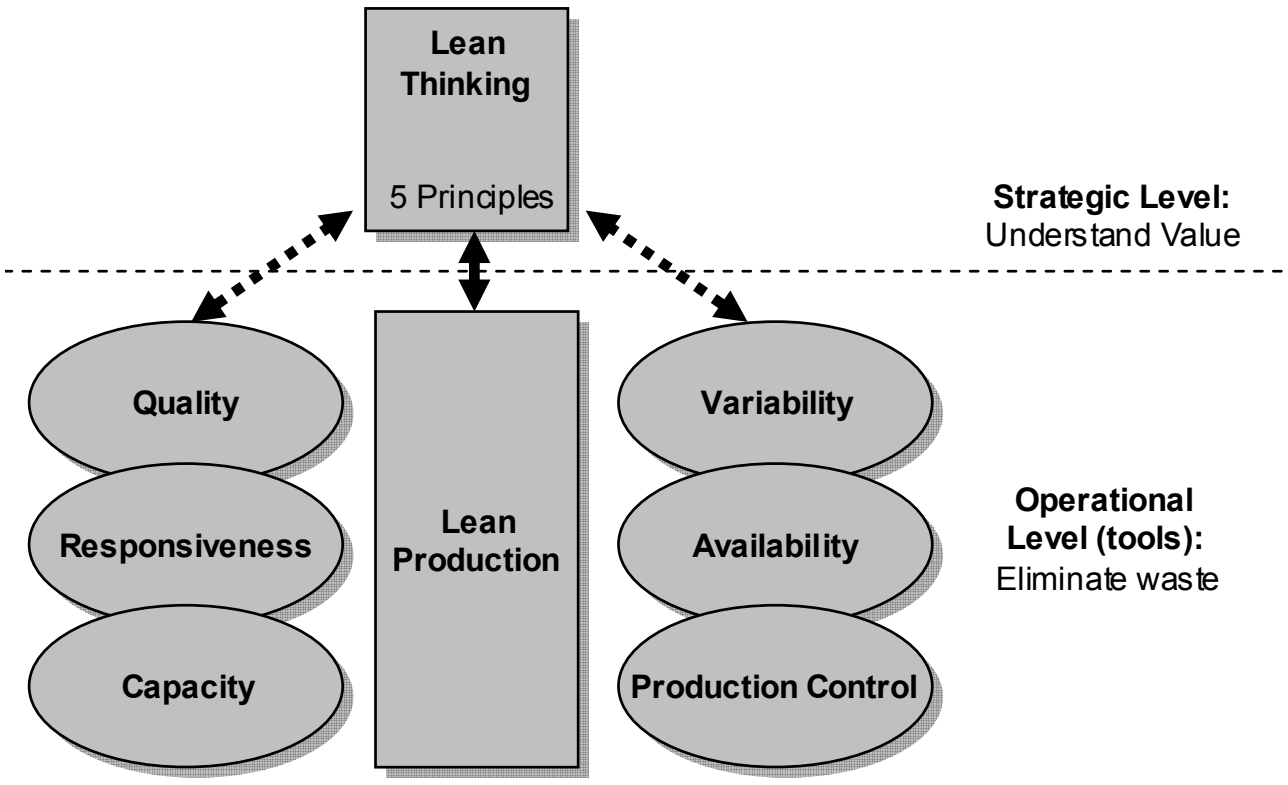
- Specify the value desired by the customer
- Identify the value stream for each product providing that value and challenge all of the wasted steps
- Make the product flow continuously
- Introduce pull between all steps where continuous flow is impossible

- Manage toward perfection so that the number of steps and the amount of time and information needed to serve the customer continually falls.

1.10 In practical terms one of the underlying assumptions made by Lean is that organisations are made up of processes. Hence, improvements made in a Lean context optimise the process or customer's journey rather than optimising individual departments. This perspective, which is widely applied in industry is sometimes referred to as the "process-based view" of organisations.

1.11 Hines et al (2004) present Lean from two perspectives – at a strategic level focusing on the principles and at an operational level focusing on the tools and techniques often associated with Lean (see Literature Review and Glossary Appendix 1). Figure 1.1 illustrates this relationship which, as the report will indicate and refer to, became an important distinction when assessing the use of Lean within Scottish public sector organisations.

Figure 1.1: A framework for Lean (Hines et al, 2004)



1.12 Given the origins of Lean thinking in the automotive sector, the application of Lean without appropriate adaptation for service organisations has been widely questioned. Whilst Bowen and Youngdahl (1998) demonstrate that Lean principles can be applied within the service sector, others (for example, (Hines et al., 2004)) highlight a number of the key criticisms associated with gaps in the Lean philosophy. The criticisms include: concerns about the increased vulnerability of Lean systems to errors or resource shortages; suggestions

that Lean systems do not cope well with demand variability; potential failure to address human dimensions of work content and work environment; and a lack of strategic perspective when implementing Lean tools and techniques. Related to the last criticism some practitioners and writers of Lean see it as a holistic strategy that provides the adopting organisation with a coherent and consistent set of practices.

1.13 In terms of public sector organisations, the literature analysis found that, to date, little application and research has taken place with regard to Lean and the public sector, except in health (Walley, 2003; Wysocki, 2004). In health, the Lean philosophy has been used to generate a process-based perspective within the NHS Emergency Services Collaborative in England. This work (Walley et al., 2001) studied the demand for emergency care within two health communities and made recommendations for the redesign of parts of the system. This innovation is responsible for substantial improvements to patient waiting times.

1.14 However, this finding does not necessarily imply that Lean is not appropriate for public services. On the contrary the literature review indicates that many of the tools and techniques used at the operational level within Lean could potentially be applied within the public sector.

CHAPTER TWO THE RESEARCH

2.1 In order to meet the aims and objectives of the study, four main data sources and methods were used: a literature review, survey, case studies and pilot studies. This chapter will outline the data sources and the research methods used.

A. Literature review

2.2 A systematic literature review was carried out to provide a critical review of the available literature. Systematic reviews were first developed in the medical sciences as part of the search for a better evidence base for policy-making and for clinical practice (Tranfield et al, 2003). More recently, they have been used in a range of health and education fields to bring together research in an orderly and transparent way so that research evidence can be used by professionals to inform policy and practice.

2.3 Systematic reviews take a defined sequence of locating, analysing, ordering and evaluating literature from defined sources within a given timeframe. The advantages are that the process is "replicable, scientific and transparent" (Tranfield et al, 2003).

2.4 A total of 81 sources of data were reviewed, summarised (in Data Extraction Sheets) and analysed. These comprised:

- Journal articles, including peer-reviewed articles
- Unpublished articles, papers and reports from current and previous research projects
- UK Government sources, including work done at the National Health Service, service delivery units and other central government departments.
- Websites of professional institutes and consultancies
- Consultation with other academic professionals

2.5 The literature review was carried out between August – November 2005. The report of the full analysis and presentation of the findings can be found in Annex 1 (Literature review).

B. Survey

2.6 A survey was undertaken by an independent research company, AtoZ Business Consultancy, on behalf of Warwick Business School to ensure that individual opinions remained confidential. AtoZ Business Consultancy undertook the questionnaire design, the design of the analysis schedule, the data inputting and the data analysis. The questionnaire contained 20 questions designed to obtain information on the type of Lean projects that have been implemented, how they were implemented and whether they had been successful in achieving their original aims. The questionnaire contained a mix of open ended and closed questions.

2.7 The Scottish Executive distributed the questionnaire via email to all public sector organisations in Scotland during September 2005. Organisations were given seven weeks in which to complete and return the questionnaires.

2.8 Completed questionnaires were returned directly to AtoZ Business Consultancy via either email or post. In summary, 26 organisations responded to the survey, with 24 providing enough data for use in analysis. It should be noted that only those organisations that had worked on Lean projects were asked to reply to the survey. This, therefore, restricted the number of replies received.

2.9 A report from the survey is presented as Annex 2 (Survey Report). Due to the small number of responses and the limitations of the survey approach, the survey results will only be used in this report in order to support any relevant findings, as will the literature review findings.

C. Case Studies

2.10 In order to assess the relevance of Lean a number of case studies were identified across public service bodies in Scotland in order to compare the application of Lean tools and techniques. Eight sites were visited by researchers including organisations in local government, central agencies and health. The primary purpose of the case studies was to gain an understanding of the following aspects of the application of Lean thinking:

- What factors made the sites suitable for successful application?
- What factors are relevant to the development of organization readiness for Lean?
- Which tools and techniques within the domain of Lean thinking have been used and which were seen to work?
- What types of problems/issues were being tackled by the Lean initiatives?
- What are the outcomes of Lean?
- What lessons are there for successful implementation?

Case Study Process and Selection

2.11 Eight case studies were conducted by gathering a range of material. This material included semi-structured interviews; site visits; observation and analysis of implementation reports, organisations' annual reports and internal management documents, such as progress meeting minutes and project and management board minutes. Care was taken to ensure that research data was validated by each host site.

2.12 In terms of case study selection the primary requirements were to identify sites where Lean and/or Lean-type initiatives had been applied, that sites should be able to be assessed in a timely manner, using a suitable cross-section of types of organization and predominantly based in Scotland[1] (see table 1.1). This achieved a suitable mix of:

[1] A key observation at this stage was that many improvement initiatives had not used Lean concepts, but instead applied alternative advanced concepts of operations management and systems thinking (although they call this 'Lean'). Some of these sites, therefore, were immediately rejected because of their lack of focus on Lean.

- 2 healthcare applications
- 2 local government sites
- 3 national/agency sites
- 1 military site

2.13 One of the case studies was in England but the rest were in Scotland, spread across the central belt and into the east of the country.

Interview Process

2.14 For each case study, it was requested that the following people were interviewed:

- At least one senior manager to confirm links between strategy and the initiative
- The programme lead
- Up to 2 programme team members
- Up to 2 staff members who were affected by the change
- Up to 2 customers/stakeholders affected by the service
- External trainers/consultants where relevant
- Relevant middle managers & service professionals (e.g. clinical leads)
- 1 IT manager/data manager

2.15 The actual numbers and profiles of those interviewed across the eight sites varied due to the varying size and nature of the organisations.

2.16 A semi-structured interview pro-forma was prepared, which was divided into key topic headings, with key questions to be asked. The document also highlighted follow-up topics for each interviewer as key words were mentioned (see appendix 3). Most interviews were conducted during September and October 2005 with the final case study being carried out in January 2006. Notes were taken of all interviews and most were recorded on audio tape and then transcribed so a full record was available.

Overview of Case Study Sites

2.17 In order to give some context and background to the case studies selected Table 1.1 gives an outline of their engagement with previous improvement programmes as well as details of the 'Lean' programme.

Table 1.1 Overview of Case Study Sites

Case Study[2]	Past improvement programme/s	Present improvement programme
CS1 Health Agency	No previous programmes mentioned	Programme supported by a consultancy (in partnership with the Institute for Health Improvement) One year targets of programme are to: • increase awareness among key stakeholders • equip people with the basic skills and tools – Lean and philosophy • get people working together • make people see the end to end process to realise the benefits • get people thinking a different way about the organisation • introduce the tools from the private sector to the public sector • become an NHS pilot for Lean management in healthcare Technique used was the Rapid Improvement Event (RIE) involving staff delivering service.
CS2 Government Agency	No previous programmes mentioned	A project rather than a programme this initiative was to enable the organisation to respond to a sudden increase in demand. Consultants were engaged to conduct a Rapid Improvement Event (RIE) involving staff, focusing on: • accommodation • ownership of cases • change in structure • increase in workload • waste of staff time on admin tasks
CS3 Local Authority	Best Value and TQM (described as too long drawn out not good at driving change) EFQM (but not at corporate level)	Consultants engaged for initial 6 months to launch programme of Rapid Improvement Events (RIE) for process improvement. Ambitious programme with 12 processes dealt with in first year. RIE chosen primarily because of its power to engage staff. Now integrating it as a tool into strategic improvement programme based on EFQM.
CS4 Local Authority	There had been a previous continuous improvement programme (technique not named) but unsatisfactory because it was not customer focused and did not deal with staff resistance to change	Business Change Process – based on 'systems thinking' aimed at delivering better customer focus supported by consultants. Rooted in Lean thinking but focussed on changing culture rather than using a Lean 'toolkit'. Processes are improved using 'check- plan –do' approach involving service practitioners.

[2] The codes used in the left-hand column of this table are used later to identify the source of quotes used in subsequent chapters

CS5 Government Agency	Rigorous performance management culture supported by Business Excellence survey which has been used for past 6 years to highlight areas for improvement.	Currently a range of improvement initiatives: • Value Chain - Enterprise Architecture • Waste Reduction • Process Workflow Efficiency • Defect Analysis • Continuous Improvement (CI) using 9 criteria in the EFQM model • Customer Satisfaction • Benchmarking Moving towards a more strategic approach with recent appointment of a Change Manager.
CS6 Government Agency	EFQM model has been used to link the organisation's strategy to operations practice. Other models (e.g. ISO 9000) are not liked - too bureaucratic. They have also avoided bureaucracy in project-based working.	No formal programme. Improvement work was project based process improvement using team working and mainly linked to implementation of new ICT systems.
CS7 Health Agency	No previous cross-organisational thematic improvement programme. Some participating organisations would have had previous change/improvement programmes	Focusing on improving the patient experience. Multi-functional teams use PDSA (Plan – Do – Study – Act) technique to generate process improvement. Programme provides external change agents to support organisations through the process.
CS8 RAF Base	No previous programmes mentioned	A Lean programme - mainly tactically deployed, but with aspirations to strategic Policy Deployment - using three main techniques: Value stream analysis (VSA) - to map out the processes and identify waste - initially at an enterprise level and then at a process level - out of which comes an implementation plan which consists of quick wins, Rapid Improvement Events (RIEs) and longer term projects. Also use a tool which is called 2P (or 3P) – production process preparation – where the nature of the process change is so great that it is impossible to do it in an RIE. The Rapid Improvement Event (RIE) is an intensive week where the new processes are trialled and put in place. It is preceded by a three week preparation phase and followed by a three week sustainment phase.

D. Pilot Studies

2.18 During October 2005 to February 2006 three pilot sites were chosen by the Scottish Executive to pilot a Lean implementation methodology. This methodology was based on the 'Weir model'[3] with the main focus being the format of a Rapid Improvement Event (RIE) (see 3.12). The team from Warwick Business School evaluated the methodology in terms of:

- Were the staff and management engaged before, during and after the RIE?
- Were the sites suitable for successful application?
- Which tools and techniques within the domain of Lean thinking were used and which were seen to work?
- What were the outcomes of Lean initiatives?
- Are there any lessons for the development of the Lean implementation methodology?
- Are there any lessons for successful implementation?

Pilot Process and Selection

2.19 Access to the sites and selection of the pilot studies was negotiated by a team from the Scottish Executive. This team also managed and facilitated the Lean implementation process which included:

- 1 day management workshop to set objectives
- Running and facilitating the 3 to 5 day RIE
- Supporting on-going implementation and project work.

2.20 As with the case studies across the three pilot sites a range of material was gathered. Observation and interviews were carried out at the 3 to 5 day RIE. Then a 'follow up' occurred where a site visit was carried out in order to conduct semi-structured interviews, analysis of reports and internal management documents (such as progress meeting minutes and project and management board minutes). A guide to the follow up was a document titled 3 C's (Concern, Cause, Countermeasure) which was a main output from the RIE and outlined the changes and improvements planned and proposed implementation. This could, therefore, act as a reference document for follow-up analysis.

2.21 However, it should be noted that due to time scales this research evaluates the Lean implementation within four weeks of the RIE event. In all cases, further work related to Lean implementation was planned for beyond that time period and so, if any subsequent evaluation of the impact and results were to be carried out after three or six months after the RIE, for example, it is likely that further outcomes would be noted.

2.22 The pilot sites selected are outlined in Table 1.2 which indicates past improvement or change as well as the purpose of engaging with Lean and the data gathered to carry out the evaluation.

[3] The Weir Model is a Lean implementation project approach developed and designed by the Weir Group. More information on this approach can be found in http://www.onesixsigma.com/organisations/Weir520Pumps

Table 1.2 Overview of Pilot Studies

Pilot Study[4]	Past Improvement/ Change	Purpose of the Lean Project	Data Gathered for Evaluation

PS1
College of FE
	Planned relocation	Improvement of the contact centre using RIE. Objective to handle telephone calls at first attempt without error & to improve the quality of information given to students.
		8 participants involved in the RIE.
			• RIE observed for 2 days
			• RIE documentation including the 3C document monitored
			• Site visit/ Interviews:
			  • 4 staff who had participated in the RIE
			  • 2 managers (including one who 'signed' off the changes)
			• 1 telephone interview with senior manager
			• Contact centre data for weeks before and after the RIE

PS2
Local Authority
	Some investigation of Lean	Improvement of the housing repairs process from first contact by customer to access to the property by repairs contractor.
		20 participants in the RIE
			• Management workshop day observed
			• RIE observed for 2 days
			• RIE documentation including the 3Cs document monitored
			• Site visit/ Interviews:
			  • 3 staff who had participated in the RIE
			  • 2 senior managers
			  • 1 union rep
			• Data before and after the RIE

PS3
NHS Hospital
	Centre for Change and Innovation (CCI) improvement initiatives	Improvement of the patient records process for emergency admissions. 7 participants in the RIE	• RIE observed for 2 days
			• RIE documentation,
			• Site visit/ Interviews:
			  • 3 staff who had participated in the RIE
			  • 2 managers (recent and current) of admissions health records.
			• RIE sponsor – Head of Information
			• Deputy Head of Information

E. Other relevant research

2.23 During the research opportunities also arose to interview and, speak with a number of Management Consultants who were either engaged with carrying out Lean projects in public sector organisations (both in Scotland and England) or wished to. Some of these Consultants had had some involvement in the case studies and pilot sites. The interviews with the management consultants were used to obtain information about the implementation methodologies they used. However, anecdotal opinion from these sources was not incorporated into the research evidence.

[4] The codes used in the left-hand column of this table are used later to identify the source of quotes used in subsequent chapters

CHAPTER THREE PERCEPTIONS OF LEAN

3.1 This chapter presents the various perceptions of Lean identified within the case and pilot studies. It will highlight that there was a very broad interpretation of Lean but all had some origins in Lean thinking. It will also show that there was a general view of a clear distinction between the application of Lean in a service context and its origins in manufacturing.

3.2 It is important to identify how the interviewees within the case studies identified, perceived and described Lean in order to both place the remaining findings into context and to help identify and define Lean for the public sector.

A. Descriptions of Lean

3.3 Of all the organizations involved in the case study work, six formally recognized the Lean thinking origins of the improvement work.

> *"While the methodology has its roots in Lean, in the end, perhaps because of its 'Lean and mean' connotations, the phrase used to describe the methodology is the 'business change process'". (CS4)*

3.4 From the perspective of one Senior Manager in a case study, Lean was seen as a practical way of using the experiences of front line staff and customers to improve services:

> *"Lean thinking is such a simple concept ...[using] real practitioners...what would/would not work? Why are we doing it this way? ...[when there was the] formation of a new authority we had four methods of doing the same thing – first thing was to pull it together decide what was the "best of" and [need to] review after 3 years." (CS4)*

3.5 In two case studies, the managers were not formally using Lean thinking concepts and had no intention of doing so. In both cases, the management style was probably incompatible with a Lean approach, but for very different reasons. In one case, the "command and control"[5] management style aggressively forced top-down improvement activity. In the other case, a reticence to use management fads was a dominant factor:

> *"No formal attempt to implement Lean thinking has been made. The quality methods and systems* [as outlined by Womack and Jones] *constitute the main methods used to structure improvement activity." (CS6)*

3.6 The RAF case probably represented the application of Lean closest to that found in manufacturing environments, both due to the "quasi-manufacturing" processes to which it was currently being applied and in the way it was being implemented via a strategic approach.

[5] Command and control is described by John Seddon as separating decision-making from work, expecting managers to make decisions with measures like budgets, standards and, targets. Also, that managers are taught that their job is to manage people and budgets

3.7 However, the case studies illustrated how they identified with the principles of Lean (see 1.9), particularly the concepts of flow, process, identifying the customer and the need to reduce waste.

3.8 As well as the definitions, the use of management tools differs in the public sector. The case studies illustrated that the service-based approach to Lean did not necessarily use a wide range of formal management tools. Process mapping was the main one used.

3.9 In sum, there was a difference between the actual type of Lean thinking considered and used in the public service sector and that used in manufacturing. In manufacturing, the emphasis is on a set of management tools and techniques that are used to standardise processes. Within the public sector, it could be argued that, there is engagement with the principles of Lean, but not with the tools and techniques (see figure 1.1). This implies that many of the tools and techniques used in a manufacturing context are not immediately and obviously applicable to service environments. However, this is not always the case, instead, there is a suggestion that some of the tools need to be adapted to cope with the need for greater process flexibility to meet the needs of the customer. In other cases, it may be that the service sector has yet to understand the value, relevance or purpose of the tools being applied from within the toolkit.

B. Approaches to Lean

3.10 Two models of Lean implementation were witnessed to be in use in the public sector, and can be described as Full Implementation of the philosophy and Rapid Improvement.

3.11 **Full Implementation** of the philosophy was considered to be embedding of the principles and broad use of the tools. One of the case studies had a model for Lean that had been implemented by a consultancy, as a very careful translation of the original implementation model used by Toyota. The full implementation model is a defined process that starts with strategy formulation to determine the role of lean within the strategic vision of how the organisation needs to develop in the longer term. This vision is cascaded using a process of policy deployment that defines implementation steps and identifies areas requiring change. The full approach can use a sophisticated means of systems analysis to identify complex issues of process behaviour that dictate how best to tackle inefficiencies. Implementation is cascaded, involving the entire workforce, looking at market requirements through the concept of *customer value*. Improvement is achieved through analysis of the systems abilities to satisfy customers' needs. Full implementation can use Rapid Improvement Events as one method of achieving employee involvement and process improvement. However, their use is carefully defined and integrated into the overall plan.

3.12 The approach used by most sites was a Kaizen-type approach, often described as a 'Kaizen Blitz' or '**Rapid Improvement Event (RIE)**'. One case study defined Kaizen in an internal guidance booklet as:

> "...from the Japanese and roughly translated means 'Making something as good as it can be. It is a set of tried and tested techniques with the purpose of bringing about real and sustainable improvement in processes'. " (CS3)

RIEs use a limited range of Lean tools to make rapid changes to small, targeted areas of a process. They focus on waste elimination and quality improvement. RIEs can be used strategically, as part of a full implementation plan. However, they are more commonly observed to be used tactically to bring about change in problem areas. Although they still use front-line staff to engage in improvement activity, RIEs tend to be more focused on short-term outcomes than longer-term developmental issues.

3.13 Therefore, the Kaizen approach uses rapid improvement events to make small, quickly introduced changes. This approach was cited by line managers as favourable as it provided a faster return for effort, was more visible and did not challenge existing management control styles to the same extent as full adoption. It was also favoured by the staff as they felt engaged in an improvement process that quickly demonstrated potential results where they had some input.

> *"Kaizen provides a way of making improvement manageable by cutting problems into bite-sized chunks. Kaizen works because it is a process which delivers quick and visible but also sustainable wins." (CS3)*

3.14 However, the consultancies that participated in the research reported they were frequently under pressure by clients to use, in their mind, the less effective method of implementing Lean. They all would have preferred a longitudinal, developmental approach and even though that took time it allowed the development of a sustainable Lean capability. This approach is also recommended in the literature (Annex 1). Consultants reported that managers from client organisations preferred to see specific improvements achieved more quickly.

3.15 Some consultants were even disparaging of the Kaizen Blitz method yet many of the case studies showed vast degrees of improvement by using this approach. The implementers wished to stress that the methodologies used were not achieving the full potential of true Lean but realised that the people at the sites liked, and even needed, a more tangible version of Lean that had clear milestone events and measurable short-term objectives. This was supported by the case study interviewees who stated that the approach was motivational and enjoyable. As stated by one of the pilot studies participants:

> *"I've been on umpteen working groups and you just felt… here we go again …but certainly with this group and approach things have moved" (PS2)*

3.16 The case studies did provide evidence that the two approaches are not naturally compatible. In particular, one of the case sites accepted that the long-term aims of its Lean programme could not be achieved purely through a succession of operational-level rapid improvement events without some form of strategic level direction. Managers accepted that their focus had been too short-term in their approach to the initial RIE. They reported that they would have liked to have restarted the first RIE to make it more strategic. Another case site successfully used their Kaizen Blitz to force through productivity improvement. In this case, there was no intention to continue with the Lean methodology once the targets had been achieved. There was only partial achievement of objectives and no staff engagement in improvement once the RIE had finished, which would make full Lean implementation very difficult to achieve in the future.

3.17 The advantage of RIE, and probably the reason why it was preferred by many of the case study organisations, is due to the perceived benefit of it overcoming the natural tendency for the public sector to adopt change slowly. However, there is a risk that the desire to overcome inertia actually inhibits the sustainability of the change and could prevent full integration of the Lean approach. Although the RIE may feel more in tune with public sector requirements, this may not be true in practice.

C. Elements of Lean

3.18 There were common methods, tools and techniques used across the case study sites which are outlined below:

Market-based demand analysis

3.19 One of the consulting methodologies that has taken hold is demand analysis. This uses customer-driven, non-rework demand to define needs and assess workload volumes.

> *"It is important to analyse demand and take out failure demand[6]. Then map process. We still don't understand demand… even after 4 years." (CS4)*

Identification and elimination of waste

3.20 Process analysis was used primarily to identify waste in each process so that it could be eliminated during improvement activity. This was seen as a way to increase the efficiency of the process and eliminate problems for staff.

> *"implementation of new processes rarely involves investment – get rid of waste. Eliminating waste frees up capacity. Main types of waste are failure demand…" (CS4)*

> *"By just concentrating on eliminating non value added steps a lot of waste can be removed" (CS4)*

3.21 Some people used the manufacturing-based "7 sources of waste" to identify types of waste. Sites using one particular consultancy firm generated different sources of waste more flexibly:

> *"Examples of waste:*
> - *Rework*
> - *Preparing unnecessary reports*
> - *Working with badly designed IT systems*
> - *Fire fighting*
> - *Working from unreliable information*
> - *Checking other people's work*

[6] Failure demand is described as the demand on a process or system because the process or system is broken and has failed to deliver. For example, in a call centre it is analysing the reason why people are calling with problems and addressing the root cause rather than focusing on reducing the cost per call answered.

- *Too many meetings/working groups*
- *Progress chasing*
- *Doing things others have already done*
- *Obtaining authorisation*
- *Work not fit for purpose*
- *Dealing with failure demand" (CS4)*

Process-based improvement

3.22 Formal process mapping was not always used as part of the waste reduction process, although it was used informally in all cases. One case of full value-stream mapping[7] was observed.

> *"So the model is: enterprise level VSA [Value Stream Analysis] – understanding the way forward. If necessary, do a more detailed VSA to take it down another level. But generally get a good enterprise level VSA generated; and then use the implementation plan to plan what are the RIEs we want to do" (CS8)*

3.23 Most sites were moving from conventional departmental structures and more towards processes.

> *"The business change methodology works around the principle that processes can best be developed by designing around the needs of customers." (CS4)*

3.24 In healthcare, the approach to process management was possibly more sophisticated than in other sectors as a result of prior capacity and demand work and the collaborative programmes[8]. Healthcare discusses process streaming:

> *"There will be a group of people who have fairly normal pattern come back and have their diagnosis from the nurse specialist who will then provide them with the support" (CS7)*

> *"We have done some outpatient clinic work for some of the teams in terms of looking at how the patients flow through outpatients. And getting them streamed for their first investigation" (CS1)*

3.25 While process improvement was the common factor across all the case studies the impact of these improvements was positioned very differently. In some cases the improvement was seen as a short term tactical achievement while in others it was explicitly seen as serving a higher purpose such as improved efficiency or better customer focus.

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[7] Value-stream mapping is a process analysis tool used within Lean to identify the key process characteristics such as the sequence of activities in the process, their speed or cycle time and contains a judgement as to whether or not the activities add value for the customer. "Current state" maps are used to capture the existing process and these are adapted to "future state" maps that suggest how the process may be changed to become Lean.

[8] The NHS in England has used a collaborative approach to improvement, whereby health regions were grouped together for training in Lean principles and to share knowledge of successful ideas. The programmes were supported by significant investment in technical guidance, knowledge development and site assistance.

3.26 Notably absent from the list of universally-used concepts was that of continuous improvement. Although the majority of sites saw continuous improvement as a key element of Lean thinking, this was not always the case. Similarly, work standardization was used in a few cases, but did not feature across all sites.

3.27 Other methods used at some sites (but not all) were:

- Process capability
- Time observations
- Spaghetti diagrams (to look at waste in transit)
- Cycle time charts
- Cellular layout (i.e. the physical layout to promote flow)
- Total productive maintenance
- Zero defects (to pursue perfection)

D. Summary

- Scottish public sector organisations made a clear link between Lean and what it could contribute to continuous improvement
- Scottish public sector organisations applied Lean in a different way to that used in manufacturing, which suggested adaptation of the concept to fit different needs.
- The principles of Lean were both widely understood and engaged with by employees where an attempt to implement Lean had been made, but a smaller range of improvement tools and techniques were used from the Lean toolkit when compared with the manufacturing sector (see Figure 1.1).
- The most commonly used tool was process mapping as a means to generate an understanding of the 'process-based' view.
- The application of Lean used by many of the case studies was that of Rapid Improvement Events or Kaizen Blitz due to its ability to encourage rapid change. Although, it should be noted that, this approach can potentially be difficult to sustain and integrate within the organisations.

CHAPTER FOUR IMPLEMENTATION OF LEAN

4.1 This section considers the implementation of the improvement programme (the implementation of the changes which come out of the improvement activity is discussed in Chapter 5). By considering the implementation process, insights and recommendations can be given regarding the methodology, its replicability and embedding of continuous improvement.

4.2 Whether discussed as a Kaizen Blitz, "blitz" or Rapid Improvement Event (RIE) the methodology used in most cases followed a similar pattern – although there was some variation in scale, scope and timescales. This chapter will reflect on the process of the RIE as well as issues affecting the implementation process.

A. Process of a Rapid Improvement Event (RIE) or 'Blitz'

4.3 Section 3.12 mentioned that the favoured approach to Lean was the 'Kaizen Blitz' or 'Rapid Improvement Event (RIE)'. The RIE approach was adopted by the three pilot sites in the study. The event usually comprised of three separate stages: preparation, workshop and follow up[9].

4.4 In the RAF case, the RIE was formalised into a seven week cycle in which the 'Blitz' week was essentially about trialling new processes which had come out of the Value Stream Analysis (VSA). The 'Blitz' week was preceded by a three week data-gathering and planning phase and then followed by a three week sustainment phase to embed the new processes.

1. Preparation

4.5 The consultant's brief for one case was typical of the structure of the preparation phase:

- Defining critical success factors and the discipline of Kaizen
- Teaching the Champion and facilitators how to facilitate events
- Train the top managers through a one day "Kaizen Culture" workshop
- Every service to have one day Kaizen culture workshops (20 in each service)
- Identify problems and issues and help think how to resolve the problems
- Develop a profile of a good facilitator and help in their recruitment and training
- Provide tactical advice as to which projects to go for – especially in the early stages, and which to steer clear of.

4.6 In most cases, a short (1 day) training event for managers was held to establish the purpose, direction and methodology for the second phase. This event was used to link current managerial issues, strategy and the Lean thinking initiative.

[9] See Literature Review (Annex 1) and the glossary for more details on a RIE/Kaizen Blitz

4.7 In a number of cases it was the role of the change managers to collate information about the service to be reviewed such as current volumes, number of steps for a process, etc. In two cases the participants-to-be were asked to carry out this work prior to the change event.

4.8 In all cases, some time was spent trying to understand the needs of the customer. A common approach was a customer survey:

> *"The business change methodology works around the principle that processes can best be developed by designing around the needs of customers. To achieve this, each service review includes…a survey of recent customers." (CS4)*

4.9 In the pilot studies, the facilitators made efforts to ensure that RIE teams would have the necessary information at their disposal, by planning this at the preparation phase. However, the research noted that much of this information could not be readily obtained before or during the RIE week. For example, the hospital pilot did not have accurate demand seasonality information and struggled to obtain this in a timely manner.

2. The "Blitz" week

4.10 Although most events were referred to as an improvement week, some actually took less time than this (3 days) but 5 days was found to be the norm. This was to maintain momentum:

> *"If it had been five Mondays it would not have worked. We would have forgotten improvements. [Intensity] is part of the trick." (CS3)*

> "*The length of the event is short… In this short time cross-functional teams from the departments had to work together for achieving common objectives. A "just do it" attitude meant that change could not be postponed." (CS1)*

4.11 The sequence below represents a typical example of a Kaizen Blitz week:

- Monday was used to train on techniques and learn principles.
- Tuesday was used to observe current practices.
- Wednesday was to design and implement a new process.
- Thursday was to run in a new process.
- Friday was to report to senior management.

4.12 However in the RAF case the central purpose of the "Blitz" week was slightly different:

> *"The physical change is at the heart of the improvement event. Three weeks of preparation data gathering to make sure you get your facts and figures straight and then at the end of the three weeks you say we have a good idea of what we want to implement physically and then that's when it happens in the fourth week." (CS8)*

4.13 Most Blitz events carefully managed the degree of involvement of staff in the improvement week. It was essential that people who were not involved did not feel left out:

"The biggest problem has been a degree of resistance from those who did not participate – [it] is addressed by having presentations for them." (CS3)

"From the service perspective all staff would be involved at some stage in the process – but usually with a small working group leading, facilitated by the Business Change Managers." (CS4)

4.14 During the week an improvement plan was developed. The plan usually sets out some basic ground rules about objectives and resource requirements for the implementation. Most Lean improvements were cash neutral, and did not emphasise cost reduction to staff:

"*But soon people began to realise that you can make change with no money*" (CS7)

"I think people very quickly got over that not having resources…[and] probably found the methodology was quite simple and straightforward." (CS7)

4.15 In one of the pilots the RIE team said that they felt that a week had been too short a time to get to grips with the process through process mapping and to trial new processes, let alone to embed them.

4.16 The Local Authority pilot demonstrated the challenges associated with the inclusive nature of the RIE week. In this case, it was deemed necessary to include 20 people in the RIE. The facilitators were able to manage such a large group by dividing tasks and allocating them to smaller groups. Even so, there were concerns that not enough people had been included.

3. The Follow-up

4.17 Most implementations had a third phase to implement more challenging changes outside of the Blitz week:

"There was also the 30-day follow through where additional actions would be implemented." (CS2)

4.18 In most cases, these were necessary where changes to physical facilities or other structural changes (e.g. IT, telephones etc) could not be adapted in the Blitz week.

4.19 Feedback from one of the pilots indicated that there was not sufficient structure around the "Blitz" week to ensure that the momentum would be sustained and the changes implemented.

B. Management Commitment

4.20 Management commitment to the improvement events was identified by everyone as a key element of the implementation. Also, the survey results reported that managerial commitment to ongoing improvement was seen as the most important factor contributing to the success of the Lean projects (Annex 2).

4.21 In one case, management responsibilities were made crystal clear with guidance stipulating that commitment must be demonstrated in the following ways:

> "By giving your time for the planning and identification of projects
> By having a vision and setting aggressive goals for your teams
> By unblocking any problems around the arrangements for the Kaizen Week
> By attending Blitz briefing sessions or delegating attendance
> By attending the Friday Blitz Report Out
> By ensuring those who need time to carry forward the implementation get it
> By continuing to engage with the team leader post Blitz about the progress of implementation
> By unblocking any problems around the implementation
> By attending the Final Report (project closure) out session." *(CS3)*
>
> *"Will it be implemented? We took ownership. The fact that the service director was there 3-4 times in the week was a good sign." (CS3)*
>
> *"I provided management support. – I attended built in slots during the week. I needed to give visible support." (CS3)*

4.22 It was also noted that few interviewees reported senior management involvement in the detailed work within the Kaizen week which is what would be expected. The implementation teams tended to encourage other staff to do the practical aspects of this work of which the outcomes would be presented to the senior management to generate their support and 'buy-in'. The commitment of senior management to be available during the RIE was seen to be important as it reflected a commitment to the improvement activity.

4.23 The pilot studies showed that management participation in RIE weeks needed to be managed carefully. Within the RIE process, managers need to be available to provide advice and expert opinion, to sign off decisions and to demonstrate commitment to the process. It was noted that some managers actually found it difficult to see their previous decisions being corrected by junior staff. In one pilot, a senior manager watched as the team withdrew a system he had championed. His lack of resistance (and indeed support) for the change reinforced perceptions of management commitment. However, in another pilot, senior management saw their role in the week as crucial to the staff empowerment aspect of the RIEs.

4.24 The pilots demonstrated the care that must be taken when management roles are determined for the RIEs. Too little involvement can create the impression of lack of commitment to the RIE, but too much involvement may stifle the team's ability to challenge existing practices. The style of involvement is also important. If managers are seen to act as gatekeepers for all decisions, however minor, this may convey that the existing top-down approach to management has not really changed. Employees may need unambiguous signals that their empowerment is real. In complex systems, such as healthcare, there was some evidence that senior managers need to have a better knowledge of the process behaviour, otherwise they may incorrectly overrule valid suggestions.

C. Scale and Scope

4.25 Attention should be paid to the management of expectations about the scale and scope of a programme, what should be included and what outcomes might be expected within given timescales. For example, in the case of one of the local authorities a number of respondents stressed the long term nature of their culture change programme which had been going five years and was well embedded (although this still met with some resistance). This supports the view from the literature that attempting culture change over short time scales can be problematic for a variety of reasons, not least, that constantly re-launching or renaming a change programme (in response, perhaps to changes in external drivers) makes people cynical about the "latest fad". In the words of one respondent:

> *"An 18 month programme is doomed to fail…" (CS4)*

4.26 Some case studies tried to control this by focussing more on small-scale, incremental, short-term process improvement which were reported as working well. In these cases, the methods used included Kaizen, RIE and Plan Do Study Act (PDSA) which were seen to be better suited to dealing with "bite sized chunks" of processes. These processes included ones, for example 'administrative change' or a 'planning application process' which usually were in the power of the management to implement or had sufficiently high levels of volume and low levels of complexity to implement some quick structural changes.

4.27 Doubt was expressed as to whether Kaizen or RIE, for example, could cope with a more strategic problem such as the integration of social care and health services**.**

> "*quick cycle redesign rather than lengthy re-engineering." (CS3)*

4.28 In the case of the RAF, while they focused very much on process improvement they were consciously working towards a time when Lean practices are an integral part of an embedded improvement culture:

> *"Yes we do [talk about culture] and that's probably another year, two years downstream for us…if we can get the culture right in our people so that when they see something wrong they will fix it as opposed to just finding a workaround…that's a culture we are trying to generate with our people because they are all going to have to do this." (CS8)*

4.29 It was noted that there may be a difference between driving improvement across an organisation of a few hundred people mainly in one physical location and trying to do the same in an organisation with thousands of staff spread across a wide geographical area. One case study hoping to take it further by operating across networks spoke about a future of increased partnership working.

4.30 The analysis leads towards a conclusion that it is necessary to generate a vision of a fully integrated Lean organisation at the outset of Lean implementation. There needs to be clarity about the timescales involved in achieving this vision and an understanding of how the Lean approach may fundamentally impact upon the organisation. Although it is appropriate to start the implementation on a relatively small scale, it should also be made clear to stakeholders that the initial work is part of a longer journey towards the embedding of Lean, through a series of carefully managed steps that steadily escalate the levels of improvement

activity and the pervasiveness of Lean. It is evident from the literature and from case studies that partial implementation of Lean is seen as a missed opportunity and risks reversal of the gains achieved. It is the relentlessness of lean that ultimately achieves sustainability.

D. Engagement

4.31 The case sites and pilot studies both demonstrated that a key challenge during the early stages of a Lean implementation is to engage ALL staff in the process as quickly as possible. Communicating among staff is also important in the engagement process (see section E below). Staff need to be engaged in Lean early on for a number of reasons. Staff not included in early RIEs can feel left out of the improvement process, occasionally resulting in a lack of commitment, resistance to the improvement ideas generated and failure to comprehend the different approach to improvement. Additionally, Lean improvement is intended to be "whole system" and there are both behavioural and technical reasons for requiring participation from all relevant groups or departments. Partial engagement may lead to sub-optimal improvement.

There is a clear tension between the need to involve all staff and the need to keep the scale of changes (and the inevitable short-term disruption) to manageable levels. The timing of the engagement of managers relative to RIEs is important, to ensure that the approach is both understood and supported.

4.32 In terms of delivering potential improvements the speed, intensive nature and design of the RIE/ Blitz possibly contributed to the ability to establish truly representative multi-disciplinary teams to implement the changes:

> *From the service perspective all staff would be involved at some stage in the process (CS4)*

4.33 Amongst those who have participated in Kaizen Blitz weeks, the response was broadly positive, once initial barriers had been overcome:

> *"The experience of Kaizen was very different. I was very sceptical at first about another improvement initiative – will anything change? My initial reaction was 'do I have to go on this?' " (CS3)*
>
> *"My first reaction was 'how do I get out of this? – no chance.' " (CS3)*
>
> *"I would like to see more of Kaizen. My initial reluctance has completely changed." (CS3)*
>
> *"I wondered 'could it work?' " (CS3)*
>
> *"You saw guys today in civvies deliberately to free people up – the guy who presented is a junior rank – at the beginning of the week – he said I'm just a junior in the rank and I said we want you because you are the guy doing the job – only you can tell us how to do it. By the end of the week he was impressive." (CS8)*

4.34 The change in attitude was not confined to the junior staff involved in the practical work. Senior managers also engaged in the concept:

> *"I was originally very sceptical. I was not a process person but [I'm] now learning the value of process." (CS3)*

4.35 The pilot studies also successfully managed to engage staff and convert initial scepticism into enthusiasm.

4.36 Finally, there was evidence that the experience of participating in a process improvement initiative had changed people's attitudes to the concept and prepared them for a future culture of continuous improvement. For example, in the case of one of the local authorities, at least as important as an outcome of the "Kaizen blitz" was the culture change reported at a personal level by those who had participated in the Kaizen process. Almost without exception the team members interviewed reported that their very negative attitude towards Kaizen was transformed by their participation in the process. This was reflected in other cases too:

> *"This event has enabled me to spot waste in every process and question why we are doing things in a particular way." (CS3)*

> *"This process has shown the amount of steps that we are dulpicating and which can be easily eliminated" (CS3)*

E. Communication

4.37 According to the literature, lack of communication is a factor that can lead to Lean programme failure. This was reflected in the case studies where communication of the activities and achievements of the improvement events was not widespread which, at times, led to people feeling as if their efforts had not received wide enough recognition.

> *"Although internal communication in relation to the change programme had been good, respondents felt that there had been little or no external communication." (CS4)*

> *"Communication was seen to be a big issue – it was felt that there had not been sufficient internal communications." (CS3)*

> *"All this is supported by wider communication…this aspect was seen as a weakness by one of the Kaizen team, amongst others." (CS3)*

4.38 Good communication during a Lean implementation has a number of benefits, including:

- Recognition of employee effort
- Motivation enhancement
- Maintenance of the momentum of change
- Sharing of knowledge across work streams or departments
- Keeping the mission on track

- Buy-in from other staff not involved in the RIE process

4.39 In a poorly communicated Lean implementation, the initial enthusiasm for Lean may quickly fall, while other staff not directly involved in the RIE may remain disengaged, resulting in a reduction in improvement activity and a consequent lack of sustainability of the changes made.

F. External Support

4.40 Outside consultants specialising in improvement were engaged by five out of the eight case sites studied. In the other case studies a special team was set up to facilitate the sector. These facilitators performed the role of external consultants to the organisations and they worked with a standard methodology (e.g. PDSA) which had already been used elsewhere in the sector.

4.41 Two of the three consultant organizations reported that they did not think they were being used to best effect. They did not see the Kaizen Blitz as "true Lean" and suggested that such approaches in isolation would not work as well as a longer-term approach to implementation.

> *"We try to avoid "kamikaze kaizen" – just seeing a problem – trying to put fires out all over the place. Sometimes they put the fire out but it does not make a real difference to the overall world." (CS8)*

4.42 There are clear benefits and drawbacks to the use of external support. From the case studies that had used management consultants and external support, there were benefits, which included:

- A well-established methodology
- Experience of Lean concepts
- Process understanding

4.43 The survey report notes that the use of external support was seen as effective or very effective by the majority of respondents (90%). In no circumstance was the external support seen as ineffective. One caveat, however, is that the management consultants used by the case study sites were all experienced in the implementation of Lean thinking in public sector/health organisations. Consultants with less exposure to public sector work, or experience only in manufacturing, might not be as effective as those used within the case sites.

4.44 The potential drawbacks of using external consultants may include:

- Possible lack of familiarity with public sector methods
- The high costs of consultancy fees
- The potential loss of internal support for externally imposed solutions
- Lack of fit with organisation culture
- Potential dependency on external support over a prolonged period of time

4.45 One local authority recognised the risk of becoming dependent upon external support and addressed this by outlining clearly from the start the role of the management consultant.

> *The task for the consultants was to introduce their version of the Lean approach – which they termed "Kaizen" - to the organisation and build capacity to enable the Council to take it forward itself. This meant specifically:*
> - *Defining critical success factors and the chosen discipline of Kaizen*
> - *Teaching the Champion and facilitators how to facilitate events*
> - *Train the top 125 managers in the council through a one day "Kaizen Culture" workshop*
> - *Identify problems and issues and help think how to resolve the problems*
> - *Develop a profile of a good facilitator and help in their recruitment and training*
> - *Provide tactical advice as to which projects to go for – especially in the early stages, and which to steer clear of. (CS3)*

4.46 Although the risk of dependency is most acute for private sector support, due to the costs of the assistance, the literature also highlighted that the NHS collaborative programmes suffered a similar problem. At some NHS sites the programme support was intended to be present for a period of 18 months. However, it often needed to be retained after the official finish of the programme due to lack of spread of capability to front-line staff.

G. Summary of the Perception of Lean

- The Rapid Improvement Event (RIE) or Blitz usually comprised of three separate stages: preparation, workshop and follow up.
- Management commitment was critical throughout all the stages.
- Managers often found the devolving of decision-making during their first RIE a personal challenge.
- The intensive nature of the RIE led to high engagement of staff at all levels throughout the organisation.
- Involvement in the event allowed staff to develop a continuous improvement mindset.
- The improvement programme often focused on small 'bite size' processes which supported high levels of volume with low levels of complexity.
- Communication of the improvement programme was seen as important to both recognise the level of improvement and the achievements of the workforce
- External support, often through management consultants, was seen to be effective and even necessary.

CHAPTER FIVE OUTCOMES OF LEAN

5.1 The test for any new management concept is whether or not the outcomes of the approach are sufficient to justify the cost and effort of implementation. The first section explores how outcome objectives were set by the implementation teams to understand the appropriate mechanisms for determining objective-setting. The nature of the objectives being set for Lean implementation and whether or not the objectives are realistic and appropriate are also assessed.

The next two sections explore the tangible and intangible outcomes of Lean. Due to the nature of service only a proportion of the appropriate performance measures that can be applied are tangible, hard measures. It is also important to understand the softer aspects of changes to service delivery. Therefore, it is equally important to assess the intangible impacts of Lean, especially upon employees. Within the literature too, some issues are identified concerning its impact amongst front-line staff.

The outcomes of the case studies and an early insight into the achievements of the pilot sites are then summarised and presented. Although, it should be emphasised that the pilot sites were still in early stages of implementation and hence the outcomes cannot be fully measured or predicted. Finally this chapter will also outline possible reasons for the failure to implement changes and the factors that may be relevant in ensuring sustainability.

A. Setting Outcomes

5.2 Although process improvement was the common goal across the board, how the outcomes were set, by whom, and at what scale varied widely across the case studies. What differed was **the relationship between the improvement of a process and the achievement of a broader objective**.

5.3 In some cases, process improvement was broken down into "bite sized chunks" which were consciously **linked to the achievement of a higher objective** or target. In these cases there was a degree of flexibility and freedom about the specific targets for each process, provided they contributed to the achievement of the higher objective. For example, in the case of one of the local authorities, the most direct outcomes are those expressed in the management goals, the general parameters of which are summarised in the Guidance to Managers:

> *"Consider areas which are key to your service where improvements would result in better customer satisfaction, higher staff morale or the achievements of externally set targets."* (CS3)

The guidance also emphasises the need to show measurable improvements, and that a balance needs to be struck between ambition versus feasibility. In this case, through the interviews it transpired that expectations (and targets) were kept tightly controlled so personnel in the organisation could meet the targets which were set.

5.4 However, in other cases this control was seen as an impediment to change, described as a "top-down 'command and control' culture":

"The rapid implementation only had a moderate success with the less politically sensitive changes taking place and everything else postponed. This may, in part, be due to the fact that the preliminary works to identify the issues have been devised almost entirely by the two people in charge of the unit. Therefore the team working was very limited in its scope to identify alternative problems or alternative issues. Similarly, other team members brought in from other departments were not allowed to bring their issues to the table. This clearly influenced the degree of commitment to the implementation." (CS2)

5.5 In other cases, **the driver for change was the only focus and desired outcome**, and all other impacts should be avoided. In other words, if the driver was service improvement linked to staff empowerment there was explicit guidance that financial targets or anything involving a decrease in staff should be avoided:

"There was a deliberate reluctance to set large strategic targets for Kaizen. It was pitched much more as a tool at the service level and the manager's targets were specifically for that service. There was also a reluctance to set money targets for Kaizen as senior management felt that this would have a negative impact on people's willingness to participate. This may need to be tested in the future." (CS2)

5.6 In one local authority, for example, the key message from the Chief Executive was that:

"Kaizen is not to cut jobs but to improve morale ... to keep competitive advantage in the public sector." (CS3)

While there was no doubt that in this case the programme was very popular with participants, with a wide range of individuals describing personal paths from deep scepticism to total commitment, there was an acknowledgement that this might limit its application to service improvement driven by the need to make efficiency savings.

5.7 This view was echoed by a senior officer from the other local authority:

"They have so far focussed on hearts and minds, rather than big stick and have not been robust in exposing savings." (CS4)

5.8 Similarly, within the RAF case study, there was a concern that **mixed messages about drivers and required outcomes** might have a negative impact on the willingness of staff to participate in Lean activity:

"When we save manpower on an activity – those people don't become redundant – we move them to other areas.... The trouble is, they don't believe that, they don't see that so we have to sell that, which is why I go about making a big issue about waste."(CS8)

5.9 Interestingly, the survey (Annex 2) reported that those Lean projects deemed to be unsuccessful in achieving their original aims were the ones mainly concerned with cost or workforce reduction.

B. Tangible outcomes

5.10 While some outcomes were very limited "bite size chunks", others looked at a whole service. Some were linked to other initiatives such as ICT projects or customer access improvement programmes. There was a wide range of tangible outcomes reported, including:

- Improving customer waiting times
- Improving service performance
- Improving processing times
- Achieving more for less
- Bringing services up to a standard
- Improvement of customer flow
- Reduction in staffing and other cost

5.11 **Improvement in customer waiting times** towards achieving a national health target:

> *"We have been able to say that they have increased their percentage of patients meeting their fixed target from around 40% in 2003 to currently sitting at 75 and 80 per cent as an over all 62 day target." (CS7)*

5.12 As an example of the practical impact of the above change, the journey for some cancer patients had 6 fewer steps than previously and an average reduction in time to first appointment from 23 to 12 days.

5.13 **Improving service performance** through migration of services into a corporate "front office":

> *"If a service area shows high levels of failure demand, the Northline Manager will contact the relevant department to flag up the situation and work with them to resolve the underlying process problem and improve the service. Since this approach is also used in the Business Change Process we can demonstrate before and after information on demand. At this review stage, we also measure capability – the measure of how well the service performs on what matters to the customer. In one service area Failure demand was reduced from 82% to 15% in four weeks." (CS4)*

5.14 **Improving processing times**. The Planning & Environment department of one of the local authorities set its goal to *"register 100% of planning applications within 3 days*". In six months the time taken for registration was reduced from an average of five days across the six areas to an average of two.

5.15 **Achieving more for less**. In one of the central government agencies the Blitz process very successfully devised a way of structuring documents in a labelled filing system so that every document could be identified quickly by the recipient who was conducting the research. This was seen to be important to cope with the increased workload with no extra resource.

5.16 **Bringing services up to a standard.** The Head of Environmental Health in one local authority described the use of the business change process, supported by one of the business change managers, which had turned around an inconsistent and failing service. He had come

from a neighbouring council with the remit of restructuring what had been three separate services.

5.17 **Improvement of customer flow.** By the use of process mapping and removing non value adding activities as well as incorporating the streaming process a result achieved in one of the health cases was a reduction in flow time for patients of 48%.

5.18 In the RAF case clear **reduction in staffing and other costs** were reported. Between February and November 2005 there were two Value Stream Analysis events, each generated an implementation plan, including 14 RIEs. These have generated a 105 person reduction in manpower and £31m budget saving. A more recent estimate of the total savings for the platform programme to date was over £60m.

5.19 The research was designed to evaluate the pilot study results after four weeks. Therefore, it would be unreasonable to expect very rapid implementation of quantifiable results. However, there was planning for a steady phasing in of the improvement actions. In pilot study 1, the following achievements can be quantified in the weeks following the improvement event:

- The number of telephone calls answered first time improved from 35% to 85% over a twelve week period.
- The number of call queries answered in full by the contact centre without passing the caller on increased from 56% to 65% in the same time frame.
- 77% of the actions identified in the initial RIE have been fully implemented in the 4 months after the RIE.

5.20 The second pilot study generated 96 improvement ideas and the third pilot 45 items. Both also developed an implementation plan (3 C's document) to act upon these, where possible, within a three-month time frame.

C. Intangible Outcomes

5.21 There was also a range of intangible outcomes delivering benefits to the customer, the organisation and the staff which can be summarised as:

- Process change
- Culture change
- Greater focus on prevention rather than correction of errors
- Support for the development of a culture of continuous improvement
- Greater understanding of the whole system and how it fits together
- Better understanding of the needs of the customer
- Improved performance measurement
- Greater staff satisfaction and confidence in themselves and the organisation.

5.22 Changing the referral **process** for patients:

> *"For the patient -– when they changed the referral process to cut out the step of referral from the GP they surveyed patients and found that they were happy because it speeded up the process." (CS7)*

5.23 Changing the **culture** of the service organisation:

> *"We used to deal with houses – we now deal with homes." (CS2)*

5.24 In one case study, Lean had contributed to a **greater focus on prevention** (as opposed to "policing" or reacting), improved partnership working, more satisfied and empowered staff working in more flexible ways.

> *"The way of work allocation now that people are nominally in teams but not locale located means that the delegation of work is easier where teams can be allocated work rather than individuals. This means that variation in workload can be spread fairly across people". (CS2)*

5.25 The improvements also supported the delivery of other programmes such as an ICT implementation or a best value review. Other benefits reported were that respondents **understood the whole system** and the organisation better and that after, having met others involved in the process, they had **better ongoing working relationships** with them and were better able to deal with problems as they arose:

> *"I have worked for council a long time – seen people's names on list but now know them and can call them. Kaizen helped make links between offices. Now lots of to-ing and fro-ing and e-mails across different areas." (CS3)*

> *"It has fundamentally changed the shape of the organisation and the shape and content of the jobs." (CS5)*

5.26 Many of the case studies reported that the improvement and change programmes had helped to create a **better understanding of the need to consider the customers** themselves as the receiver of the service, rather than the needs of the central department.

> *"There is a customer focus attitude**:** that they are there to serve the community – not 'ivory tower we know best'". (CS3)*

> *"General role of Lean thinking is increasing. Customer focus – Lean thinking helps." (CS4)*

> *"I was looking at how we could collectively help in improving the process from the patient point of view." (CS7)*

> *"Patient involvement is at the heart of the ….Plan and the…[organisation] has tried to ensure that the patient's voice is heard during the redesign process." (CS7)*

5.27 Related to the last quote, this health case involved patients directly in the mapping and redesign of services by organising special sessions for patients which were then fed into the service redesign process. Although, interestingly, within the same case study it was reported that it was felt that there was still some way to go in creating a customer focus, with one respondent commenting that compared to the private sector retail environment, where she had recently worked, customer care practices in the NHS were fairly poor.

5.28 In addition, putting things right when they go wrong was easier because the services have **better information** about, and **understanding of, the process**, as well as **supporting a culture of continuous improvement**:

> *"...previously they were producing all this audit data and nobody was actually paying attention to it. It was not in use as a tool which I think is what they want to do now. Because they have been tying that into the changes they are actually much more aware. I think they will be much more willing to recap and much more able to say right what is happening where has it gone wrong why has it gone wrong and is it something we can do to change that. And as a team we can – fine if it is an external factor then we seem to have a better ability to communicate that in an appropriate manner. To have something done about it if that is the case." (CS7)*

5.29 The two local authorities both mentioned an **increased emphasis on measurement** of, for example, customer demand as one of the beneficial spin offs from their improvement programmes. However, commentary on one of the agencies suggested there was an excess of performance management in that organisation, which effectively amounted, in Lean terms, to waste.

5.30 The **staff** also benefited in a number of ways, including **greater job satisfaction**, improved **confidence** and development of a **critical mindset** to embed a continuous improvement culture.

> *"I think for some of the staff involved they have seen some changes happen that they wanted to see and then actually making that change now, which they never managed to do before. I think the general feeling of the staff here is that they are providing the patient with a better service." (CS7)*

5.31 Staff were generally happy with the results of the change activity. A particular characteristic was where they saw efficiency improvements as helping them in their own work and **enjoyment** of work:

> *"Most people think it is a nice place to work." (CS6)*

> *"I think the better service we do the better life we all have the better we do our job."* *(CS6)*

5.32 For others, the experience had built their **personal confidence** and convinced them that the **organisation would listen** to their ideas and that it would implement change. The following comments were from Kaizen team members from one of the local authorities:

> *"I'd not been in the job long and realised how much knowledge admin and clerical jobs require. We are not given credit for what we know. This was my first opportunity to make a contribution to improvement." (CS3)*

> *"I have been in the council quite some time and it was the first time I was involved in looking at the process." (CS3)*

> *"It was pleasing to come to the end of the week and having gone through a complicated process with something different from what we do." (CS3)*

"We can now see how everyone works – we need more of that – team working has begun to bear down. It will improve the way we work."

D. Overview of Outcomes

5.33 Table 5.1 summaries some of the qualitative and quantitative outcomes for both the case and pilot studies. It is interesting to note that both tangible and intangible outcomes are reported for the majority of the organisations.

E. Failing to implement changes

5.34 While all the case studies documented some positive outcomes, concern was expressed across the case studies about the gap between proposals coming out of the improvement process and what was being implemented. The reasons for the possible 'failures' to implement changes are varied and have been highlighted in the literature as common factors for failure (see Annex 1).

These can be summarised as:

- Lack of resources
- Resistance to change
- Post RIE/ Blitz week lack of ownership for the improvement activity
- Lack of management, and staff, commitment throughout the change process
- Slow natural pace of change

Lack of resources and resistance to change

5.35 Sometimes the failure was simply due to lack of resources to implement changes, maybe due to the difficulty in "backfilling" into the posts of those being seconded into change agent roles.

5.36 People also cited resistance as a failure to implement change, especially staff who might be affected by the changes but who had not been through the process. For example, in the case of one of the government agencies:

"A separate element of the Kaizen Blitz identified the problems caused by the accommodation…. On the Wednesday of the Kaizen Blitz the team started to implement … changes. Unfortunately the Team Leader …who had suggested the multi-disciplinary team approach could not be present on that day…. As a consequence, when the other team members turned up to move people's desks and swap people round into multi-disciplinary teams [those] not involved in the Kaizen Blitz refused to cooperate. Consequently this change did not take place." (CS2)

"Even though one third of the complete workforce within the unit were involved in the Kaizen Blitz, this did not succeed in bringing about support from the Department as a whole. There was a lot of dissention from people left out of the Blitz process. This factor is probably the most important in the lack of success in implementing the idea of multidisciplinary teams." (CS2)

Table 5.1 Summary of the Qualitative and Quantitative Outcomes of the Case and Pilot Studies

<table>
<tr><th>Case or Pilot Study</th><th>Outcomes/ Achievements</th></tr>
<tr><td>CS1
Health Agency</td><td>At the start of the event three key measurements were set targets. They were flow time, manual or touch time and the number of steps in the process.
Flow time was the time taken for the patient to go from being admitted to A&E, departure to ward or theatre with the necessary diagnosis and necessary treatment.
Manual time or touch time was the time in which some activity was being carried out by the staff on the patient.
The number of steps was the steps that were being carried out by the staff from admitting to discharging a patient.
The results are tabulated below:
<table>
<tr><th>Measurement</th><th>At Start</th><th>Target % Chg.</th><th>Target</th><th>At End</th><th>Actual % Chg.</th></tr>
<tr><td>Flow Time</td><td>135 min</td><td>50%</td><td>67.5 min</td><td>70min</td><td>48%</td></tr>
<tr><td>Manual Time</td><td>96 min</td><td>25%</td><td>72min</td><td>50 min</td><td>48%</td></tr>
<tr><td>Steps</td><td>84</td><td>25%</td><td>63</td><td>19</td><td>77%</td></tr>
</table>
Other improvements reported included seven minor process improvements, reduction in transportation required and patient hand-offs reduced from 23 to 13 as a consequence of the value-stream mapping exercise.</td></tr>
<tr><td>CS2
Government Agency</td><td>The outcome for the project was simply to be able to cope with the additional workload within existing resource constraints. Through a combination of elimination of waste, plus passing some of the work to other departments, this has predominantly been achieved. The Department achieved their on-going target of never failing to complete their part of the process within the seven day limit.

Subjectively the team believe there was better quality of the reports coming out of the unit and better communication between those covering similar work.

People were set up nominally in teams, but not locale located, which meant that the delegation and allocation of work was easier as teams were allocated work rather than individuals. Variation in workload was now spread more evenly across team members.</td></tr>
<tr><td>CS3
Local Authority</td><td>A range of outcomes was reported from the ‘Kaizens’ which had already been carried out. For example, on a tangible level:
Planning & Environmental Services (the first Kaizen conducted, in December 2004) aimed to reach a target of “to register 100% of planning applications within 3 days”. By July 2005 the time taken for registration was reduced from an average of 5 days across the six areas to an average of two. (Three of the areas succeeded in meeting the 100% target but poorer performance in the other three areas brought the average down to 97% - although the project was considered closed.)</td></tr>
</table>

	This example reflects another outcome which was to **develop a culture** where teams have the absolute right to amend the management goals set and that they can improve them by setting more challenging targets. The culture change was an important outcome of Kaizen reported at a personal level by those who had participated in the Kaizen process. Almost without exception the team members interviewed reported that their very negative attitude towards Kaizen was transformed by their participation in the process and the sceptics were converted into enthusiasts. Other benefits reported were that respondents **understood the process and the organisation better**, and that after having met others involved in the process they had a better ongoing relationship with them and, were better able to deal with problems as they arose. For others, the experience had **built their personal confidence** and convinced them that the organisation would listen to their ideas and that it would implement change.
CS4 Local Authority	Outcomes included **improved service performance.** One example was the migration of services into corporate 'front office' where for one service area 'failure' demand was reduced from 82% to 15% in four weeks. In another example the Environmental Health Manager reported the use of the business change process to turn around an inconsistent and failing service. This service was the removal of abandoned vehicles. The service had moved from: An average of 28 days to remove vehicle Poor awareness of service Average 1000 enquiries per annum Average 250 cars removed per annum £15 charge to council per vehicle removed to: Average 3 days to remove vehicles – 95% in 7 days Proactive approach taken – service marketed and advertised Demand peaked at 3300 enquiries per annum – now 2500 Removal peaked at 1300 per annum – now 800 New contract for uplift – no charge to council Similar improvements were reported for the dog wardens service and the pest control service, including service improvements at no extra costs. **Less tangible benefits** included more focus on prevention, improved partnership working, and more satisfied and empowered staff, working in more flexible ways and, a change to a culture of continuous improvement and customer focus.
CS5 Government Agency	There were a range of benefits reported from the various improvement initiatives, for example: **Waste Reduction** - Major reductions in the cost of mail sorting, printing, telephones, computer licences, procurement (of booklets), PR and bank charges which have been achieved in the current financial year and totalled £1m of savings. A target had been set for the following year of £695,000. **Process Workflow Efficiency** - Customer services (call centre staff) were carefully monitored. Issues such as telephone response time were key measures. **Customer satisfaction** - Customers were routinely surveyed (typically monthly) with 400 calls per month in the samples. The survey looked across 14

	dimensions of quality (both qualitative and quantitative). Responses of "excellent" or "good" were deemed to be a "pass" and this was used to formulate an overall percentage satisfaction score.
CS6 Government Agency	Staff were generally happy with the results of the change activity. A particular characteristic was where they saw efficiency improvements as helping them in their own work and enjoyment of work. This had led to a significant **decrease in the staff turnover** which was now around 4% compared to previously 25 – 30%. The process improvements had made a difference to various dimensions of performance and had fundamentally **changed the shape of the organisation and the content of the jobs.** They had **reduced the acknowledgement time** to three days, with a lot of applications actually being acknowledged on the day of receipt. The **processing time had been reduced** to between 14 and 21 days.
CS7 Health Agency	The objective for the programme was to **improve the patient experience** through the implementation of the 'Top 20 Actions for Change' and to support the hospital networks to **achieve the target of a maximum of 62 days for all urgent primary care referrals to commencement of first treatment.** In one centre they were able to report that they had increased their percentage of patients meeting their fixed target from around 40% in 2003 to currently 75 - 80 % as an overall 62 day target. As a contribution to this for one process, the journey of a cancer patient, there were now 6 steps fewer than previously which had allowed an average reduction in time to first appointment from 23 to 12 days. In other parts of the process they reported that for the first consultation the time was on average 23 days and it is now down to 12 days and they were looking to reduce this further. Other examples were outpatients moving to endoscopy within 2 weeks. Having been 45%, it was now 92%. In terms of intangible outcomes: For the patient, a survey had found that when the referral process was changed to cut out the step of referral from the GP the patient reported feeling happier because the process had speeded up. For the organisation and staff it was reported that although the changes achieved through process mapping and PDSA had been reasonably easy to sustain, putting things right when they went wrong was easier because the services had better information about, and understanding of, the process. The staff stated that they had now had the opportunity to make changes happen as well as seen other changes occur which had never happened before.
CS8 RAF Base	According to a programme spreadsheet between February and November 2005 there were two Value Stream Analysis (VSA) events. Each generated an implementation plan, including 14 RIEs. These generated a 105 person reduction in manpower and £31m budget saving. A more recent estimate of the **total savings for the platform programme to date was over £60m.** **Staff empowerment** was also reported as an outcome, with the long term aspiration of culture change. They were working towards a time when Lean ceased to exist because the **improvement culture** was totally embedded in the organisation.
PS1 College of FE	RIE found 56 corrective actions to implement Staffing levels more rapidly brought up to required levels to achieve response targets

	More calls answered at first attempt (30% - 85%) More queries answered without the need for passing the customer to another department Improvement in staff morale Improvement in teamworking and joined-up working
PS2 Local Authority	RIE found 96 corrective actions to implement Improvement in employee morale Better team work and inter-department communication Reduced inter-department frustration, misunderstanding and politics Project plan for implementation of 96 actions
PS3 NHS Hospital	Initial outcomes included some “quick wins” from the RIE around waste and process flow. Other outcomes included better understanding of the cross-cutting process under review (processing of admissions records) and engagement of staff in problem solving. Continuous improvement was also reported as being developed through giving staff responsibility for the “3Cs” list which ran at 45 items. The opportunity to reduce unnecessary “decisions to admit”, saving £250 per patient per day

5.37 Pilot study 2 highlighted that unions needed to be engaged in Lean effectively if there was not to be formal resistance to change. A union representative was involved in the RIE, resulting in union support for Lean because of the perceived benefits of Lean working on employee morale and workplace stress. It should be noted that the policy of no compulsory redundancies had a positive effect on the willingness to adopt Lean. In the follow-up interviews it was revealed that without this protection for staff Lean would have been seen as more of a threat by staff and unions.

Post RIE/ Blitz lack of ownership for the improvement activity

5.38 There was evidence of some delays in implementation following the RIE week. From one of the health cases, it was observed that improvements from improvement events could be difficult to sustain if post event ownership was poor and follow-up did not work.

> *"[*What happened on the following Monday?] *Not a lot – it took a week. [*How many recommendations?*] 8-10 – half have been implemented – harder ones have not. We have not met as a team since." (CS3)*

> *"This lets people slide back into their comfort zones and there is resistance to change. Small improvement that can be adopted on a personal level can be left to wait till another such event is organised. Lack of continued management support and resources can mean that this improvement is only short lived*." *(CS3)*

5.39 In the other health case the resistance appeared during the improvement process and was not overcome, which prevented implementation of suggested improvements after the event:

> *" Mapping day – some came well prepared. 20-30 people. Some people said they would not move. Their attitude focussed the discussion (and were a barrier) and decision to move forward. Two hours only . PDSA was not presented – it was all very quick…Still at planning stage – study. Still trying to implement." (CS7)*

Lack of management, and staff, commitment throughout the change process

5.40 The importance of staff engagement was explicitly recognised in one of the local authority cases, which used Kaizen, as one of the key features. The participation of practitioners which, when combined with speedy implementation, helped sustain the commitment of those affected by the changes most of whom had already been directly or indirectly engaged in the process. It was made clear that should the commitment from management to attend the Rapid Improvement Event slip, the commitment from staff to participate would probably also slip and so, therefore, would the implementation of potential improvements.

5.41 In one of the pilots both staff involved in the RIE and sponsoring managers said that the RIE process could be clearer about the next steps post RIE. The manager in particular said that while she took on board the clear message from the facilitators not to take over and "managerialise" the outcomes of the RIE, the staff were not perhaps taking as pro-active a role as they had been invited to take. She speculated that this might be due to the lack of

seniority of the staff involved, which she acknowledged was a good thing in principle, combined with the culture of the organisation which did not normally encourage this sort of responsibility.

5.42 In other cases it was the perceived lack of support from, or capacity of, senior management that blocked implementation of changes:

> *"The outcomes of the project had been communicated to senior management but to nobody else. However, it should be observed that even some of the changes were not communicated to senior management very deliberately. In some cases some of the changes were deemed not to be part of government policy or department policy and this would cause senior management to react unfavourably to the change suggestions. Therefore some changes have taken place quietly without senior management knowledge." (CS2)*

> *"External constraints may limit the amount of time the CEO has to implement these changes." (CS6)*

> *"We need to have a stable management to see these changes through." (CS6)*

5.43 Staff and middle managers within organisations were identified as key barriers to Lean implementation in two of the case sites, largely because they had variable abilities, some had been in the organisation a long time and were only focussed on the day-to-day delivery. In some cases, managers owed their position more to professional seniority rather than to being effective managers, which impacted upon their readiness to engage with Lean improvements.

> *"There has been tension between front shop/back shop – with the perception that the best of the crop goes to front office…" (CS4)*

> *"Middle managers…there is still considerable resistance." (CS4)*

Slow natural pace of change

5.44 In most of the case study sites, interviewees reported historical tendencies for the slow pace of change in their organisation. In two cases, this lack of response had resulted in crises that had forced radical change involving new management teams. In the Lean implementations some RIEs equally suffered from this inertia problem with the improvement ideas being put back into existing bureaucracies. In one pilot site interviewees commented that a pre-Lean suggestion to introduce a customer handbook had taken two years and was still not ready. After the Lean implementation no work was immediately completed but a plan to introduce improvements to a schedule was devised.

"At this time. I don't know of any [changes]. I know the board is having meetings" (PS2)

> *"I have not seen any result because we have not actually implemented them yet"*
>
> *(PS2)*

5.45 The purpose of the RIE approach is to introduce change quickly to minimise the risk of loss of enthusiasm. One council employee conveyed the impact of lack of action to change suggestions before Lean was introduced:

> *"They would see their line manager in the past. He would maybe make a suggestion and nobody comes back[to him] – people just felt terrible" (PS2)*

5.46 The ability of the organisation to adopt changes quickly is clearly a necessary characteristic. Although this point is relevant for all public sector organisations, additional care should be taken where changes need to be formalised or adopted on a wide scale. This is especially relevant in healthcare where some changes may need to be authorised by committees that meet infrequently. The momentum for Lean has to be sustained during these delays and at times this may be difficult.

F. Sustainability

5.47 Many of the case studies addressed the issue of how to sustain continuous improvement. Resources and organisational capacity, culture change and knowledge transfer, and leadership and communication were seen as the main ways of trying to ensure this.

5.48 In the case of one of the local authorities using Kaizen it was the sheer scale of the work which appeared daunting. Each process improvement was owned by a manager and developed by a team of around a dozen people working full time over the course of a week. The commitment of all participants was impressive but there has to be some concern about the **capacity of the organisation** to sustain such a programme, both in terms of the skills required to drive the programme and the heavy resource required for each Kaizen.

5.49 The dangers of not providing **sufficient resources** or some sort of "invest-to-save" mechanism to recycle resources through improved efficiency was also highlighted in one of the health cases where the management still have not secured funding for the cost of quality improvement. They have benefited from free consultancy and hence seem to have gone into the process with the attitude that there was nothing to lose.

5.50 In four cases, though interestingly not in the government agencies which worked to a more commercial model, there was a conscious effort to **transfer knowledge** from external consultants to internal consultants. While this was seen as positive, there was a concern in some cases that the particular methodology used might get diluted unless there was an independent quality assurance role taken by the change agents, although, as we see from one of the health case studies, this role was by no means clear:

> *"…we went in and undertook the exercise with them and then explained what to do with the initial PDSA cycle with the view that they would then have the ability to – or should have the ability to undertake those on a longer term basis whether we would always be a support mechanism should we need to come back in" (CS7)*

5.51 In the RAF case the sustainability model was also based on **skills transfer**:

"Although they [the consultants] cost us £2000 a day they are saying there are a lot of these things you can do yourself and they are happy to do it whereas some other companies won't tell you what the secrets are and we get all the tools." (CS8)

5.52 However there were some perceived problems with this approach:

"…in some areas we have managed to pass over the expertise to the Lean team guys, the problem in the RAF though is people keep getting posted…. You can challenge that but … the problem is our model is about transferring skills over a time period… not immediately."(CS8)

5.53 In another case study there was resistance to the idea that a continuous improvement culture could be achieved by knowledge transfer except through direct participation i.e. no manuals or "toolkits". **Leadership at a strategic level and communication were seen as key** to supporting the development of a continuous improvement culture which ideally needed to be the responsibility of all employees at all times rather than being driven from the top:

"Continuous improvement should be a part of one's daily work and not a once a year event that one has to attend. Each person should be flexible to learn a new way of doing things if this is in the interest of improvement." (CS1)

5.54 An interpretation of these findings is that sustainability requires a critical mass of people who are comfortable working with Lean practices. In the short-term this requires behaviour change and those using the tools and techniques being trained in Lean. However, the objective is that once a critical mass is achieved, Lean should become standard practice and so self-sustaining. This sustainability may be difficult in public sector organisations where there are implementation difficulties associated with a naturally rapid turnover of staff, e.g. the rotation of junior doctors. Also, if practitioners within public sector organisations become experienced enough in Lean, there is a possibility that they will be attracted to work elsewhere, including a loss of some experienced staff to the management consultancies implementing Lean.

G. Replicability

5.55 Linked to the concept of sustainability is the question of replicability. This could be considered at two levels. First of all, is a particular methodology replicable across different organisations and secondly, could a particular process improvement be transferred between departments or even between organisations? There was an acceptance that, notwithstanding cultural and other contextual differences, the former might be possible (maybe through the use of external support).

5.56 On the latter point, however, there were opposing views, though this view was limited. For example, one of the improvement programmes in health makes a virtue of offering "off the peg" process improvements as a way of engaging with target hospitals:

"…[The organisation] supports … networks across all three regions in Scotland. Results demonstrate reductions in delays and improved services. The team are now

encouraging services to adopt a core number of successful changes to reach national targets." (CS7)

5.57 Health care is possibly a special case where there are many sites of a very similar nature that can adopt very similar practices. Nonetheless, it was more common to see a reluctance to completely replicate practices from one organisation in another. For example, change agents in one of the local authorities made it clear that:

In their view "drag and drop" is dangerous: "Methodology can be transferred - but not processes." (CS4)

5.58 Similarly in another case study, while one senior manager in the same organisation saw the improvement programme as an opportunity to standardise a particular service across what had been three districts, the change managers had a rather different view:

"This is not about standardisation but specialising. Four different processes across different areas – important to look at demand across different areas…In one particular local process – look at demand for X in specific area. Otherwise lose learning aspect – staff engagement." (CS4)

5.59 The pilot studies showed that conventional tools used in Lean implementation can be successfully adapted and applied. There were no issues for staff when they used the concept of 'non value-adding activities' and the methods of process mapping successfully identified cross-department issues. Again, the pilot studies usefully demonstrated the above comment that it is the methodology that must be transferred rather than particular solutions to specific problems.

H. Summary of Lean Outcomes

- The outcomes expected of Lean ranged from short-term tangible targets to broad organisational improvements and cultural change.
- The entire range of outcomes have been achieved, from quantifiable service-level improvements in all sites, to broad, long-term shifts in organisation culture within the most established case studies.
- Successful Lean implementations tended to view cost reduction as a secondary rather than a primary objective.
- Headcount reduction was not seen as a primary Lean objective.
- Tangible Lean outcomes included improvement in customer waiting time, service performance, processing times, customer flow as well as bringing a service up to standard and being able to achieve more for less.
- Intangible Lean outcomes included a better understanding of process, joined-up working, the whole system, performance measurement, a support for continuous improvement, increased staff satisfaction and confidence, and an ability to embed a continuous improvement culture.
- Achievement of all the outcomes in the Scottish public sector, where some organisations were not used to improvement methods, was often set to a slow pace that could not be forced too hard.

- Failure to implement changes was reported to be due to lack of resources, ownership for the improvement activity or commitment from both management and staff.
- Sustainability can be achieved through ensuring that there is enough organisational capacity, knowledge transfer, clear communication and strategic leadership.
- To a degree, the Lean implementation process can be replicated, but there was agreement that actual service process improvements are site specific and could not be.

CHAPTER SIX CONTEXTUAL FACTORS AND ORGANISATIONAL STRATEGY

6.1 It was apparent in the case study analysis that some internal and external drivers existed which were reported to have influenced organisations' decision to adopt Lean. In some cases it was possible to isolate a single driver, more often there was a more complex picture. By understanding and presenting these drivers it may help to develop mechanisms to engage public sector organisations to consider Lean implementation.

6.2 Improvement and change is often linked with strategy. Within the literature (annex 1) it advocates that any improvement and change should be linked to the strategy. This is supported by figure 1.1 which illustrates the principles as 'strategic' whereas the tools and techniques are 'operational'. Therefore, this chapter will also present the findings related to the strategic process used within the case study organisations and the degree to which the improvement programmes were linked into this process. This relationship of how strategy can impact on Lean and how Lean can influence strategy is presented in the final section of this chapter in order to assess the relevant importance of this relationship.

A. Drivers for change

6.3 The drivers for change towards a 'Lean' approach reported included:

- Leadership (especially the Chief Executive)
- Achieving performance indicators
- The introduction of a new technology
- Government agendas
- Recommendations
- Changing policy environment
- Threat of competition
- Demand for increased efficiency
- Service expansion with limited resources

6.4 Effective **leadership** is commonly seen as an essential driver for change. In two case studies, an agency and a local authority, it was the Chief Executive who was the driving force for the changes implemented. In both cases, the Chief Executive had a view to shape new working practices and ideas. In one case, the Chief Executive promised neither to reduce pay nor enforce any redundancy as a result of the new Lean approach, which also coincided with the introduction of single status[10]. In the other case, the appointment of a new Chief Executive was at a time of crisis where the media was commenting that the customers were not receiving adequate service and the agency was "in meltdown":

> *"The place had not been subject to any proper change programme ever since it had been set up. [We] had a lot of morale issues; staff turnover at the time was somewhere between 30 and 35 per cent." (CS6)*

[10] Single status is the assimilation of existing employees to the new pay spinal column in accordance with the agreements reached in the Scottish Joint Council.

6.5 Here the appointment of the new Chief Executive was seen as the catalyst for change as well as a key part of shaping the organisation as he used the opportunity to introduce new approaches ranging from implementing information technology (IT) systems to improved quality procedures.

6.6 **Achieving key performance indicators** (KPI) was another reason cited for driving change in processes and practices. It was mentioned that by redesigning some processes and looking for opportunities for change so that some KPIs could more easily be met.

6.7 **New IT systems** in both agencies had allowed these organisations to reflect on their current processes and use their introduction as a means to implement new ways of working across the organisation. In another case there was a perception that the systems cannot deliver change, leading to a requirement in the Corporate ICT strategy that a business change exercise must be done prior to the implementation of any ICT system. This scepticism ran deeper in the view of the change managers:

> *"...you can't trust IT systems to deliver...IT can help but IT must pull system...[but]...not once has there been an IT solution [as a result of the Business Change Programme]." (CS4)*

6.8 A couple of cases mentioned that the impetus to introduce Lean ways of working came from the need of **managing outcomes and the relationship between itself,** as the local service deliverer, **and Central and Scottish Government**. In these cases, drivers also included the efficiency agenda, funding (or the lack of it), e-government, the new Best Value audit regime and community planning.

6.9 In most cases, Lean had been brought into the organization by some **external recommendation or policy**. This is especially evident in healthcare, where most formal process improvement activity in England is underpinned by Lean thinking as a philosophy. This has resulted in diffusion of the approach across to the NHS in Scotland. This diffusion has recently accelerated with the closure of the Modernisation Agency and the dispersion of its Lean thinking facilitators throughout the UK to NHS management jobs.

6.10 A health case mentioned the change being driven from a **national strategy** designed to improve services over the years which hoped to provide, amongst other things, rapid access to diagnosis and treatment, improved treatment and investment in staff and technology. Overall, in a health case it was mentioned that they just wanted to work smarter and to introduce a customer focused approach to their ways of working, hoping to increase quality and help create efficiency savings to reduce the financial shortfall. However, it was also mentioned in both health cases that the consideration and implementation of Lean appears to have been opportunistic or connected to some short-term advantage usually in the form of extra funding.

6.11 For one case study the driver for considering **changing working practices**, or looking at how they could carry out their role more efficiently, had been triggered by the announcement that a second organisation (deemed to be the 'customer') would be opened, which would **double the workload, with no additional resources**:

> "Managers within the unit were told *'Get on and do it, do the extra work, there will not be any financial resources provided'". (CS2)*

6.12 Both agencies felt the external driver coming from the **threat of competition**. It was mentioned a number of times by both that *"the work could always be outsourced to someone else"*. A perceived low barrier of entry meant that the organisations felt the strong need to justify their service delivery and look to ways to continually improve:

> *"the world does not owe us a living" (CS5)*

> *"I think as a company we have to be aware that we have to be competitive" (CS5)*

> *"... if we are cost effective, efficient and delivering a good service it makes it less attractive for somebody to come in and do these kind of things" (CS5)*

6.13 Regular **policy changes** were another reason organisations gave as an external driver for change. Although some, particularly the agencies, had attempted to shape the timing of the policy changes so that they could manage their impact more effectively into their organisation. What any policy change meant was that organisations needed to be more flexible at being able to adapt to the changes. Understanding the processes, the work flow and reduction of waste were seen to help with this flexibility.

6.14 An emerging driver mentioned by some was the '**efficiency in government' agenda** with the increasing emphasis not only on value for money but on efficiency – with the Minister for Finance and Public Service Reform, Tom McCabe, setting a target of £1bn efficiency savings for government in Scotland over the next 10 years. Linked to this was also the mention of the 'Gershon report'.

> *"The fact that 54% of Scottish GDP is represented by activity in the public sector – compared with 42% in England - has contributed to a recent and growing emphasis from the Scottish Executive on improving efficiency and achieving value for money." (CS3)*

> *"Modernising government was about improving customer services – now it is about saving money..." (CS4)*

6.15 There was a similar driver in the RAF case:

> *"... the main driver for Lean in* …[this]… *programme is a target of achieving a total budget reduction of 50% over with only a 3% reduction in task." (CS8)*

B. Strategy Process

6.16 In order to understand if the change programmes have been considered within the context of an overall strategy it was important to ask the interviewees some details about their strategy process. For example, this referred to the development of the community strategy for local authorities or, the vision and objectives for the government agencies.

Strategic Planning and Development

6.17 For many of the cases, in common with many large organisations, *"strategy was a struggle"*. **Strategy** was cited as **taking a back seat to operational requirements** *"can't spend too much time on strategy – too busy running things"* and, that it was difficult sometimes to get the whole organisation to implement something consistently.

6.18 There was a question mark about **how effective strategic planning** was, citing political tensions with different pulls on politicians and managers making it difficult to create a coherent strategy for the organisation. However, for one health case, they have used this tension to their advantage by influencing the development of the plan as they had leaders in this field and areas of high profile best practice. For another case study, however, the decision to expand the provision was felt to be not well thought through and not part of a formally-planned strategy.

6.19 For one of the agencies the **strategy development process** has improved, especially with the introduction of the change management role. Three directors are involved in the development of the strategic direction (corporate management):

> *"I would say things have changed quite dramatically within the company in terms of strategy." (CS5)*

6.20 The other agency was probably the most focused case study in terms of strategy development where a **small group of senior managers led the strategy development**. This was followed by an **'away day'** each year with all the staff to discuss the strategy for the following year based on customer and staff feedback as well as a variety of others sources.

> *"This [the strategy process] is the corporate plan…..we have a half day away day every year to look at things and take things back; taking things from the staff survey, customer survey." (CS6)*

Linking Strategy and Improvement

6.21 In most cases **the connection** (often referred to as the 'golden thread') between the organisation's aim, strategy, business/departmental/community plans and the continuous improvement work was fairly weak although there was acknowledgment that a clearer understanding of the relationship would be helpful. The ability to generate and sustain improvement activities with the strategic objectives and goals of the organisation can help in prioritising improvement and make it an integral part of their activity and not something separate (see literature review Annex 1).

6.22 A common issue across many cases was how well embedded a particular change programme was within the strategy of the organisation. In one case it was described as **fully integrated**:

> *"This appears to be a successful business change programme firmly tied to the theme of modernising government and improving access to services – and as such it matches*

very well the Lean ethos of service improvement through staff and customer involvement." *(CS4)*

6.23 In other cases there was a **post-facto realisation**, leading to a "retro-fitting" of a particular approach into a broader improvement programme. Within a local authority case it was described that whether or not Kaizen was initiated as a corporate continuous improvement programme or simply as a way of engaging more staff in fairly low level service improvement there was little doubt that the organisation, having seen the benefits of Kaizen, was seeking to embed it in its overall continuous improvement approach:

> *"Kaizen is now beginning to embed itself within the Council's strategic approach to quality development. It lies at the heart of our corporate commitment to continuous improvement in the way we deliver services to customers, and supports the Council's approach to achieving Best Value by bringing about real improvements in service performance." (CS3)*

6.24 In another case there was partial alignment of the strategic goals to the improvement activity but these goals were not known to the entire organisation. Hence, the link between the strategic goals and the improvement exercise could not be drawn and so it led to a certain amount of scepticism, lack of ownership and a feeling of another top down initiative.

6.25 For one local authority there was a formal strategic planning process linked to the electoral cycle and, in the opinion of one of the Senior Managers, the Council has recently got better at linking the strategic plan and service plans. However, the **links between the strategy and budget planning** were weak and it was also perceived that there was a **weak connection between strategy and improvement**.

6.26 This was supported by a health case where the improvement programme had not yet been sufficiently integrated into the organisation's strategy, which had constrained its effectiveness. The following exchange with the regional facilitator indicates that, in this case, there was no systematic link between strategy and service improvement:

> **"*Q:*** *So there was a group who in one sense were reasonably switched on to the idea of improving the system?*
> ***A:*** *Yes, met regularly to look at the service.*
> ***Q:*** *But they were not working to very specific objectives.*
> ***A:*** *No.*
> ***Q:*** *They probably did not have a consistent methodology.*
> ***A:*** *No I would not say they were aware of anything.*
> ***Q:*** *But there was a will.*
> ***A:*** *Yes." (CS7)*

6.27 One agency cascaded the strategy to people in a variety of ways including encouraging **Improvement teams** to help with the implementation of major pieces of work:

> *"On a strategic level there is always something and at our level we have set up a number of improvement teams. It is getting them to think about themselves and we know what the solution might be." (CS5)*

6.28 The other agency had **focused on IT and the use of technology** to improve operating efficiency:

> *"I think within the next year or two we will be as close to a paperless office as it is possible for a civil service outfit to get." (CS6)*

> *"We have seen a lot of suggestions for change, on the IT front …we have done as much as we could that is where we have been heading over the last five years." (CS6)*

6.29 Another approach taken was to create an improvement programme across a **network of hospitals** to help support the change process which itself has aims which are in line with health agenda and targets.

> *"…working in support of improvement. The focus of the work is to enable clinical teams and their support staff to make changes happen and to encourage changes that are sustainable." (CS7)*

> *"The programme was the glue between the networks and the trusts" (CS7)*

6.30 However, even with this approach there was a variable fit between the programme and the strategies which the hospitals had developed. Although, in their view there had been more of an alignment over the past year due to the programme being linked with a short-term target with the hospital Chief Executives receiving monthly reports which they feed into the action plans.

6.31 Some cases cited the use of tools such as the European Foundation Quality Model (EFQM), or a local version of it, as providing a link between the deployment of improvement tools and the improvement strategy.

6.32 In the RAF case, while the consultants had aspirations that the organisation would adopt Lean at a strategic level, the reality was that it was competing with a number of other approaches in different parts of the organisation, including the use of the balanced scorecard:

> *"*[The consultants are]*…trying to get them, with varying success, to go down the policy deployment routine …so that effectively they have clear cascading down from their high level objectives and the methodologies needed to get there …It's a difficult one to sell to them – with the IPT* [Implementation Project Teams - part of the Defence Logistics Organisation] *they are on the balanced scorecard, which is roughly doing the same stuff but a completely different methodology so it does seem to be a waste of time to do both." (CS8)*

6.33 Two cases highlighted the possible approaches to developing an improvement strategy. In the first, one of the local authorities, what had started out as a relatively low level process improvement technique was increasingly becoming broader and linked to the corporate continuous improvement approach based on EFQM. In the other case (one of the health examples), the project seemed to follow the opposite trajectory starting out as an improvement programme with a very broad remit but very quickly trimming its sails to become more of a technique to help deliver a time-limited target. As it was observed in one case study:

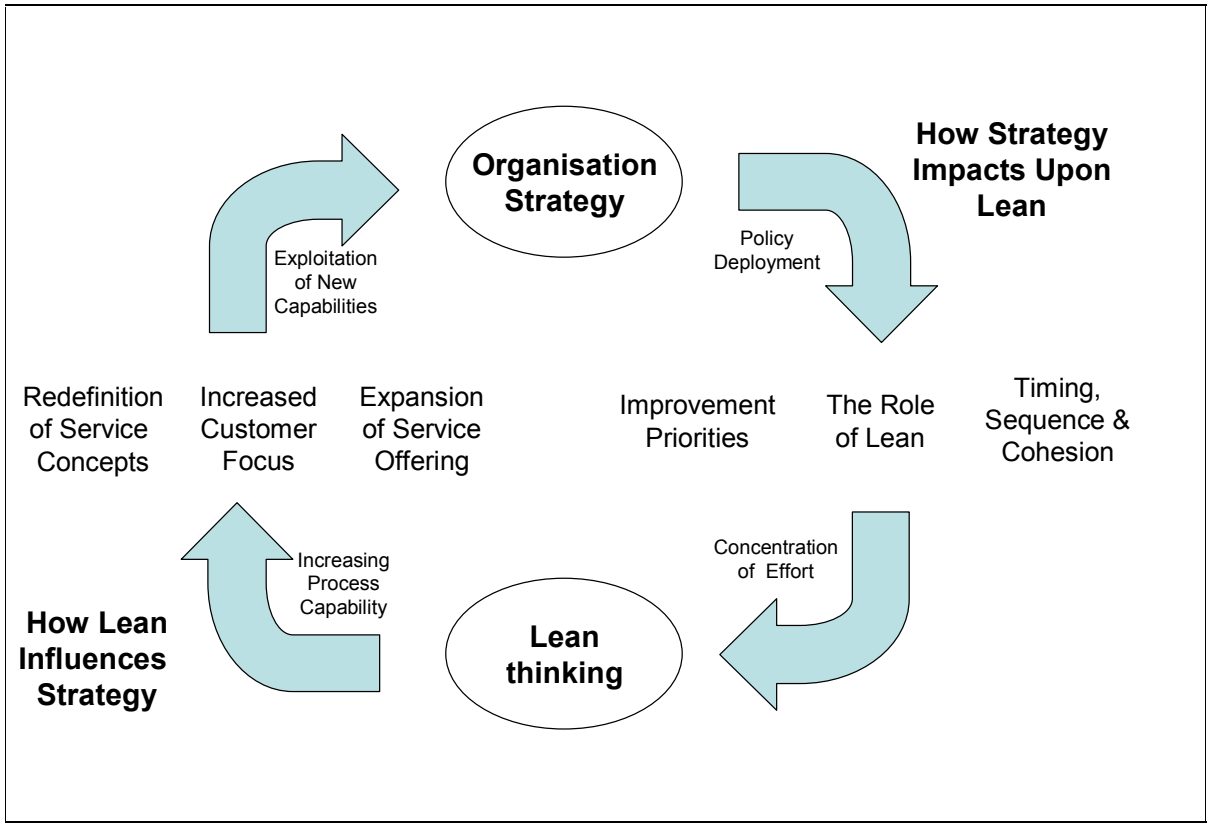
The ...[Organisation] seems to have adopted a "broad and shallow" strategy as opposed to a "narrow and deep" approach. This was probably essential given its limited resources and relatively short timescale. (CS7)

6.34 Therefore, the link between strategy and an improvement strategy or even improvement could be argued to be fairly weak across most of the case studies. However, as highlighted in the outcome chapter (chapter 5), this weak link has not hindered the impact of Lean, particularly the RIE approach. This may be due to the reported great opportunities for improvement within the public sector, as one management consultant stated *"the opportunities are not even low hanging fruit but apples on the ground"*, which means that the need to link the activity to strategy is not needed to achieve any benefit in the shorter term. Whatever the reason, there is a great possibility that if greater links between strategy and improvement are not made then issues of sustainability and replicability become important i.e. it may become difficult to sustain a Lean programme which has no link to the aim or vision of an organisation and, it may be difficult to replicate a Lean approach if the reasons or context for it are not understood. The following section expands on this importance of linking Strategy with Lean.

C. Reflections of the Relationship between Strategy and Lean

6.35 Figure 6.1 attempts to clearly illustrate the advantages, benefits and outcomes of having a clear relationship between strategy and Lean. By having a strategy it allows clear policy deployment and concentration of effort which in return, allow increased process capability and exploitation of new capabilities.

Figure 6.1 Relationship between Strategy and Lean



6.36 Lean potentially represents a major change that impacts upon the long-term direction and focus of the adopting organisation. It is important that this **role of Lean**, as part of the strategic development process, is understood. In case study 1, the organisation faced short-term financial pressures and also had a desire to substantially improve the quality of patient care, both in terms of outcomes (mortality) and the "customer service" quality of the delivery process. It was recognised that the Lean implementation, by itself, was not the appropriate mechanism to deliver the required substantial cost savings, due to the short timescale for this change and the sensitivities of the situation. The short-term financial outcome was not included in the role of Lean in the early implementation phase. It was seen that Lean could help improve quality performance and so the role of Lean was focused on reducing mortality as a key measure. This was achieved through improvements to patient waiting times and reductions in process waste, indirectly achieving some cost savings as well as the quality improvement. This decision affected **where Lean was started, its timing and how the first RIEs linked to later events**.

6.37 Organisations are often faced with a number of **improvement priorities** that may conflict with each other. For example, healthcare organisations are facing the twin aims of "demand pooling", to reduce the likelihood of queues forming, and the "choose and book" initiative to provide patients with more choice about when and where treatment is delivered. The two have an obvious conflict as demand pooling sometimes stops patients from choosing precisely which doctor they see (e.g. for a follow-up outpatient appointment). Such interactions need to be managed in a process of *policy deployment*, which relates high-level strategy to specific improvement projects and identifies the areas of potential conflict. A strategic Lean implementation normally starts with a policy deployment exercise. This exercise helps to define improvement priorities and generates ideas about the content, timing and sequence of specific aspects of the Lean implementation. This would include decisions such as identification of the areas that receive attention for RIEs etc. The policy deployment brings cohesion to the implementation plan for the roll-out of Lean.

6.38 The results demonstrated that Lean has potential to dramatically improve the quality performance, or process capability, of individual services. When this is achieved, the new process capability impacts upon strategy. For example, in case study 4, the Lean process radically redefined how the organisation tackled the problem of abandoned vehicles. They recognised that they could in fact **expand their service offering** to one with a more customer-friendly approach, that provided better facilities for the disposal of unwanted vehicles and was also more cost effective. After Lean, the new "vehicle collection service" collected more than double the number of vehicles as before, but at less cost. In fact, the new service has a small income stream. The service also has better integration with other public organisations that interacted with the service, such as the police. The **redefined service** represents a radical change to the service concept offered by the council.

6.39 Before Lean, many sites reported concerns that an increase in service quality may increase demand for services, creating financial pressures. The case studies showed that the **increases in customer focus** and delivery efficiency also tended to reduce concerns about demand, as increases in demand could be absorbed more readily by the more efficient processes. It some cases, anticipated requirements to restrict demand for services are not as necessary. Improvements to processes and radical changes to the types of services offered may actually help redefine organisation strategy through the exploitation of new capabilities.

An organisation that develops a capability to deliver enhanced service quality at no additional cost can develop more ambitious improvement strategies in future years.

C. Summary

- Policy changes, Government political agendas (e.g. the efficiency agenda), changes of leadership and the threat of competition were all factors that drove the adoption of improvement programmes including those using Lean concepts.
- Some case study sites had been forced to introduce improvement approaches more aggressively following serious organisation crises.
- Approaches to improvement were focused in different ways, ranging from programmes that used hard technologies, such as integrated IT, to soft technologies such as Lean
- Strategic planning and development was rarely cascaded throughout the organisation and linked to the improvement activity.
- Operations and service delivery dominated the drive to improve.
- IT, networks and improvement teams were means by which some links were made between the strategy and improvement.
- The apparent weak link between strategy and improvement has not impacted the outcomes of Lean. However, this may change in the longer term as organisations become more process focused and need to more clearly allocate resources to appropriate improvement activities.
- There is a clear link between Lean and organisational strategy; and realisation and understanding of the relationship between the two can help drive organisation performance.

CHAPTER SEVEN ORGANISATIONAL READINESS FOR IMPROVEMENT

7.1 The research found that organisations who were more engaged with Lean and had considered and planned for it were ready to embrace the ideas and concepts of Lean or improvement. This chapter outlines a number of organisational factors that affect the ability of an organisation to implement an effective improvement programme. Three main elements identified were:

- An awareness or realisation for the need for improvement
- Developing or planning capacity within the organisation to deal with change
- Developing an organisational culture which understands the customer, processes and uses data to drive improvement.

7.2 These are presented under the concept of 'organisational readiness' and relate to many of the points already presented. However, this concept became one of particular relevance and importance within the research as the degree to which the organisation was ready appeared to have impact on its ability to engage with Lean or, indeed, any improvement or change programme which, in turn, impacts upon outputs.

A. Need for improvement

7.3 Many of the respondents across the majority of the case studies believed that improvements needed to be made and there was acceptance that there were problems at different levels. These included Director-level structuring of teams to deal with the implementation of a new IT team, to managers aware of issues through backlogs or 'work in progress', to front line workers working in Kaizen teams to address process problems.

7.4 In one case study, where 75% of this department's staff were manual workers, they understood the need to ensure that people were in a position where they felt they could contribute. Kaizen was not the only method used and many things were done to make staff feel involved, including meeting people, open forums and newsletters.

7.5 In a further case study, the programme had to be sold to combat "initiativitis" and to overcome pockets of resistance, and this has been accomplished over time due to evidence that the programme had delivered. The evidence had been communicated through word of mouth, through the publication of a "Storyboard" which gave examples of the 500 processes which have been improved by focussing on 20 core "Actions for Change" and an imminent target.

7.6 Each of the pilot sites had clear and specific reasons to attempt implementing a Lean approach. In the case of Pilot 1, the imminent move to a new, expensive site had created the managerial opportunity to encourage radical ways for the processes and systems to change. Furthermore, there was a strong business case for the need to improve student recruitment practices, due to the impact of the costs of the new sites. At the level of the pilot implementation, there was a clear recognition that existing practices were causing problems for both staff and students. There was a comparable need for radical restructuring in Pilot 2, due to mergers of smaller council organisations, coupled with a recognition by management that both quality and cost efficiency needed to be improved. It could be argued that Pilot 3

was the least ready to adopt Lean practices of all the sites. There was not the same degree of management or professional acceptance of the need to change and there were even concerns that Lean would interfere rather than support intended improvements. Crucially, the managers in Pilot 3 perceived that Lean could detrimentally impact upon short-term reporting of performance measures to Government.

B. Capacity for improvement

7.7 In order to create capacity for improvement within the work force some cases had to rely on current resource, considering more efficient means of managing it whereas others 'bought in' resource through new appointments. For example, one agency had recently appointed a new change manager whereas another *"did a big change nine months ago (where they) changed the whole management structure of the company".*

7.8 One of the Senior Managers felt that Lean reflected the way they had already had to work with increasing workload and no increase in resources, and Kaizen was a tool to help them address externally-driven changes whilst ensuring buy-in from staff:

> *"Kaizen is the staff's experience of the efficiency drive – it's been a great way of getting buy in from junior staff." (CS3)*

7.9 For some cases the improvement agenda and the tools and techniques that accompanied it were new. One case study reported that it did not have any experience in improvement and in fact had not changed their processes in any way for many years. Some people were saying that no changes had taken place for probably 10–15 years**.** In Pilot 2, the lack of experience of change was widely recognised:

> *"I don't think they had a great deal of experience in terms of process and procedures and what was going to change as a result of this. So I don't think they had a lot of experience of that at all – some did. Some of the tradesmen ... have never been involved in [improvement] in their life."*

7.10 Therefore, some experience of processes analysis and implementing change is a necessary characteristic for implementing Lean and organisations lacking this experience may initially struggle to achieve a capacity for improvement.

Teamworking

7.11 Team working was often cited as an important, even critical, aspect of the Lean approach as well as other change or improvement activities. It was reported that team work allowed organisations to generate a capacity for improvement.

> *"The team leaders speak to their staff and ask them to put forward any concerns that they have it is basically about the processes." (CS6)*

7.12 Within the case studies there were both mixed approaches and feelings about team working. Often the impression was that people were used to team-working at a local level within departments, although it appeared less effective across departments, especially where there were large physical distances between offices.

7.13 For the RAF, while there had been improvement programmes in the past they had not been sustainable. They had appointed a Lean manager and a central Lean team by secondment to which the consultant transferred his skills, but they were also transferred to the teams actually carrying out the RIEs:

> *"… the whole idea is that the Lean team receives the skills from us during the skills transfer and they start to run their own events. With joint consultation with us because it is always helpful. So the guy who was facilitating the launch day event did a fantastic job…I just popped in for a couple of hours per day and he was running simple 6S[11] ones and I just touched in for half an hour and we did some planning together… and that's what we should do, so 6S stuff, some standard work then into year 2 they should really be starting to do that and that is good value for money." (CS8)*

7.14 The pilot studies further demonstrated both the need and the value of team working. In Pilot 2, the process of housing repairs spanned a wide number of disparate departments and locations. The RIE event needed a minimum of 17 people to ensure that each stakeholder group was represented. The RIE successfully addressed these issues:

> "*[Lean] breaks down the barriers, to create a more integrated team work" (PS2)*

7.15 In Pilot 3, there were additional challenges to bring a multi-disciplinary team together for a sustained period, especially as there were additional professional boundaries that inhibited team working.

7.16 The majority of the case studies did encourage multidisciplinary teams even if they only existed for the life of the improvement project. This was evident in two health cases, an agency and in a local authority where teams were constructed to consider a particular process i.e. within the 'Kaizen Blitz' or RIE week.

7.17 One of the most striking examples of developing a capacity for change was with an agency case study where the approach to quality and continuous improvement could be described as being driven in a very organic or emergent way through questioning and opportunity to implement changes though guided by direction from the top. This approach had developed a culture of team working, questioning, improvement and determination to succeed in a clearly defined strategic framework.

7.18 To summarise, the results suggest that the organisations with a history of managing change, that had previously tackled process change and were able to build effective, multi-disciplinary teams were those with the greatest capacity for Lean improvement. Therefore, some organisations will need to assess their own capabilities or degrees of development in each of these dimensions so that they can anticipate the implementation challenges that Lean presents. For some public sector organisations it may be that the introduction of Lean needs to be timed appropriately, so that some preparatory work can be carried out to generate this improvement capability.

[11] In this case 6S is an adaptation of the Lean thinking "5S" tool which contains five separate aspects of assessing workplace orderliness, tidiness and general housekeeping. The added sixth "S" is sustainability.

C. Organisational Culture

7.19 The literature frequently sees Lean as a significant culture change. When implementing Lean it is necessary to treat organisation culture both as a factor that influences ease of implementation and as an outcome variable. An effective Lean implementation needs to cope with the cultural barriers to adoption and also to change employee expectations, beliefs and behaviours. The most relevant aspects of culture influenced by Lean include:

- The degree of focus on the customers and their needs
- The understanding of the organisation as processes in a dynamic system
- The ways in which data is collected and used for improvement
- The ways in which quality measurement drives continuous improvement.

7.20 Most organisations exhibit different characteristics across each of the above dimensions and the Lean implementation may need to be adjusted to cope with the necessary changes of emphasis. Care may have to be taken in situations where aspects of culture are initially diametrically opposed to the Lean approach. For example, in many public sector organisations, the current approach to management focuses on Government target achievement in a performance management style. This often restricts the availability of useful data for continuous improvement purposes and limits objective measurement.

Understanding the Customer

7.21 Within public sector organisations there is on-going debate regarding 'who is the customer?' The first principle of Lean is to 'specify the value desired by the customer' so there is a need for organisations to understand or define who their customers are and what their needs are. Some of the case study organisations carried out customer surveys, which were believed to help develop an understanding of customer requirements and needs. The results, from customer and employee surveys, were used to identify and highlight areas for improvement that were visible to all part of the organisations.

> *"Customers are routinely surveyed (typically monthly), with 400 calls per month in the samples." (CS5)*

> *"We have got customer surveys and all that, that are issued on a regular basis and we get lots of feedback. The away day is [used] to see the kind of comments that have been coming in on how staff feel and, if [staff] can improve on the level of service that we have got." (CS6)*

7.22 As well as a survey, a government agency also encouraged customers to give improvement suggestions on a web page and through focus groups. By understanding and meeting customers' needs the customer receives a good service and it generally places less demand on the operation (through rework and so on).

Process or System Perspective

7.23 In chapter 1 it was stated that the Lean approach assumes the concept of a process-based view, where organisations are divided by workstreams rather than functional departments. This mindset is taken further to understand these processes as complex, dynamic systems, where a change to one part of the system may have an unanticipated impact elsewhere. The systems perspective is intended to encourage improvements that can be sustained. At the most basic level, Lean is tackling the excessive departmentalisation of organisations to create what is colloquially referred to as "joined-up working". One council has taken steps to embed the business change process and to create a culture of continuous improvement. Whilst some respondents felt that their organisation was process based "where process is obvious" others, often further down the organisation, described the organisation in departmental structures.

> "*We are in boxes. Kaizen is the start of breaking it down." (CS3)*

7.24 A couple of case studies mentioned that although there was a move to a more process-based culture there was still a long way to go given the existing (departmental) structures.

> *"This is a very departmentalised structure and there is a need to move much towards a process-based way of working to get the research done with a faster throughput time. However, people do not interpret this in this particular way, and they certainly do not have a systems or process perspective." (CS2)*

> *"we don't actually have a process management as a formal structure" (CS5)*

7.25 An agency case study recognised the usefulness and importance of a process view and was trying to develop this through enterprise development work by helping other departments to create a more process way of working. However, this was still in its early stages, with no real process ownership, processes not dovetailing properly, and a large amount of handovers still occurring.

7.26 One of the health cases attempted to use the process/system approach in order to understand the patient's journey, this had particular impact if the understanding was created through getting staff from along the journey together.

> *"they only saw their own part of – their small part of it and I think once they saw the whole patient journey together they had a better feel for what the patient experiences…And people say 'I did not know you did that and if I knew you did that I would have asked you'. The connection between the different thoughts just does not seem to happen until you have them all in the one room." (CS7)*

7.27 The same view was expressed in one of the local authority cases:

> *"I have worked for council a long time – seen people's names on list but now know them and can call them. Kaizen helped make links between offices. Now lots of to-ing and fro-ing and e-mails across different areas." (CS3)*

7.28 Feedback from two of the pilots indicated that one of the most important benefits of the RIEs was that staff gained a view of the whole process which would not normally be possible in the silo-based organisations in which they worked.

Data Collection and Analysis

7.29 Collecting and presenting data and information was considered a way of creating a culture of improvement. Targets and measures were cited by a few case studies as a means to focus attention on key areas of business. For example, they were said to *"help concentrate the minds of the Trust Chief Executives who were responsible to the Scottish Executive for the achievement of the targets."* There was also a feeling that most people knew about the targets and non achievement and, therefore, the need to change, which helped with the sign up. Some of the case studies were surprised about how useful this process was.

> *"I would say as the programme commenced we were probably not as good at putting information in at the beginning of the change. But I think they had reasonably good audit data being collected on a monthly basis and with some of the changes we were able to use… that ongoing gathering of data to show an outcome of reduction in time from x to y." (CS7)*

7.30 However, the level of the use of measures ranged significantly across the case studies. One case study had no formal quality measurement system, focusing only on their delivery target which they usually missed. Others had extensive quality measurement both externally and internally. For example, one case study mentioned continual student and staff surveys, a performance measurement system, delivery reports which represent an overwhelming amount of information about performance and issues. They reported a monthly summary of quality in delivery which for September 2005 ran to 42 pages of analysis.

7.31 One case study, an agency, focused their quality measurement on staff and customer feedback. The same case study also extensively checked for quality, errors and service levels in the high volume processes:

> *"On the core processing business we have various internal checking systems. New staff, for example, have the quality of their work checked out 100% that is usually in the first few weeks and then as they gain experience and get better we progress and we reduce the level of checking to zero in some cases. Again when I first came here everybody had 100% of all of their work checked." (CS6)*

D. Summary

7.32 In summarising the need to understand and be aware of organisational readiness table 7.1 highlights the dimension together with the impact if it is not addressed prior to a Lean implementation. The table also shows how implementing a Lean approach can benefit and support the dimension.

Table 7.1 Potential Dimensions of Organisational Readiness

Dimension	Evidence base	Potential Impact	Benefit of a Lean Approach
Acceptance of need to change	All successful case sites had experienced either a crisis or a major organization event that highlighted the need to change. One pilot site demonstrated considerable lack of acceptance of the need to change.	Lean programmes cannot be successfully established if personnel do not accept that there is a need. Symptoms would include: • Lack of management buy-in • Lack of direction for the programme • Lack of attendance at RIEs • Failure to implement or sustain changes	The Lean process exposes the organization to the waste, errors and delays in the system, highlighting the need to change
Capacity for Improvement	The most successful case studies demonstrated a history of attempting improvement. A few sites conveyed problems associated with lack of experience in improvement	Improvement events will not achieve sustained changes unless the right types of change are implemented correctly.	The Lean methodology encourages frequent, small-scale, low risk changes that provide an excellent opportunity for the organization to develop change skills
Team working	The majority of case and pilot sites had a history of departmental working that makes team working difficult Some sites still retained hierarchical management structures	Cross-functional process redesign cannot happen unless multi-disciplinary teams are able to function effectively.	Improvement events deliberately bring together the teams and provide a suitable environment for "no-blame" team working
Unsupportive culture	The most successful sites consistently demonstrated values that fostered improvement activity and generated commitment to change	Symptoms would include: Management style that does not adapt to empowerment and team working and lack of trust for devolvement of decision-making	The preparation for Lean often includes training for middle management, to manage expectations and condition new roles
Lack of customer focus	Whilst all successful sites showed clear commitment to serving customers, some evidence demonstrates the difficulties of combining customers' needs and professional priorities	Inability to consider "customer value" Inappropriate optimization of processes	The "value" approach forces a different perspective to achieve a customer focus
Lack of process-based view	Many sites took considerable time to move away from departmental optimization. Many organizations divide demand in ways other than customer journey, e.g. by patient symptom, or by technical modality	The customer's journey cannot be optimized without a process view System dynamics often cancel out the benefits of changes that have been taken without a process view	Lean relentlessly pursues a process perspective of the organization.

Lack of improvement data	Most sites needed early preparation of data for use in RIEs Some sites had no knowledge of basic improvement information e.g. demand for services, error rates, time requirements etc.	Processes cannot be successfully changed unless basic information is available	The Plan-Do-Study-Act cycle encourages evidence-based change

This chapter has demonstrated that the capacity for improvement through lean is influenced by:

- An awareness that improvement was needed which, in turn, engaged staff within the organisation.
- Clear and multiple avenues of communication, which were used to highlight the impact of the changes and improvement and motivate staff.
- Targets, Performance Indicators (PIs) and measures, which were used to focus minds and guide the improvements.

In terms of benefits, the Lean process itself has:

- brought some of the PIs and measures into question.
- allowed many of the case studies to question, analyse, and so, improve their processes, understanding of customers and team working.
- given public sector organisations in Scotland a greater appreciation of processes, flow, waste and what the customer valued.

CHAPTER EIGHT IMPLEMENTING LEAN IN THE PUBLIC SECTOR: CRITICAL SUCCESS FACTORS

8.1 Chapters three to seven have highlighted a number of points and issues that were raised within the research. These have been summarised at the end of each chapter. This chapter will reflect on the findings presented in order to identify the critical success factors and barriers to change regarding the implementation of Lean in the public sector. This analysis together with points raised in the findings will then present a series of questions designed to address the aim and objectives of the research before clearly answering the following:

- Can Lean work in the public sector?
- How can Lean work in the public sector?
- Can Lean be replicated?
- Can Lean embed a culture of continuous improvement?

A. Critical success factors

8.2 Analysis from the research with organisations in the Scottish public sector, together with evidence from the literature (Annex 1) indicates that a number of factors are important in terms of a successful improvement programme:

- Organisational culture and ownership
- Developing organisational readiness
- Management commitment and capability
- Do not under resource
- External support
- Communications and engagement
- Strategic approach
- Teamwork
- Timing

8.3 The cross case analysis indicated that developing a real **organisational culture** of continuous improvement was a factor for successful application of Lean. This meant developing an awareness and understanding of processes, flow, waste and customer value.

8.4 Staff in the case study sites reported initial scepticism towards Lean as *"just another management fad that would eventually fade and disappear"* but the success of the approach had converted many people within a short time. However, as writing in the literature points out, each organisation may only get one chance to implement Lean and if this fails it could quickly develop a reputation for 'not working here'. **Staff ownership** of the Lean projects was cited in all pieces of research as a key factor to success.

8.5 The case study and pilot studies analyses highlighted the importance of **organisational readiness**, which had been a less significant theme in the literature. All the case studies reported an awareness of the need of change and improvement. The analysis suggested that organisations should consider if, and what type of, capacity and mindset they have for change and improvement. The lack of sustainable, relevant and related quantifiable

results, particularly in the pilot studies, indicated that some Scottish public sector organisations may not currently be in a position to embrace the complete Lean philosophy. The existing literature and the pilot studies demonstrated that degrees of sub-optimal, departmental working, top-down management style and potential union resistance may all influence the effectiveness of Lean, unless these factors are addressed. It is also difficult to implement Lean in circumstances where organisations are distracted by performance reporting crises.

8.6 **Management commitment,** in terms of being visible and sustained**,** was mentioned in almost all case studies in terms of supporting the implementation of the programme, methodology proposed and driving improvements. Similarly, the two most successful pilots had been chosen partially for the reason that management had clearly demonstrated commitment to the approach used. In the third pilot, commitment was not as complete, especially amongst senior managers who were more focused on a performance management approach to improvement. These pilots demonstrated that the RIEs cannot be successfully managed unless the support is total. A failure to commit leads to lack of attendance at events, partial engagement in the change process and a visible reluctance to implement the workforce's ideas.

8.7 From the start management commitment was seen as crucial to the success of Kaizen. As one of the Kaizen team put it, the key ingredients are: total management commitment, benefits and focus on benefits to the customer, and focus on benefits to the employees and the organisation:

> *"The idea is to embed the approach in the organisation so it becomes the normal way to change." (CS3)*

8.8 Whilst there was wide variation in the level of resource required to carry out the improvement process and implement any changes, all cases highlighted the **need for resources** for both stages and for a plan to sustain this resource at staff and management level. The most successful implementations of improvement and Lean programmes required considerable managerial resource. Getting staff released from duties and other work pressures were reported as barriers in the survey, with dedication of time, a committed delivery team and appointed facilitator noted as success factors.

8.9 In the majority of cases, **external support** was brought into the organisation, at least to kick start the improvement programme. All respondents and case study organisations had spent money on external implementation support over a period of time. Some of the case studies indicated that although the external support was important it was only really necessary at the beginning of the programme and for initial education and in developing a manageable Lean process. Then the consolidation and development of the Lean programme could be handed over and carried out by dedicated internal resource.

8.10 In a number of cases the specific improvement programme was shaped by a chief executive or senior manager with previous experience of improvement. Therefore, Scottish public sector bodies seem to have achieved a **good balance of internal and external support**.

8.11 In all cases, effective **clear communication** to ensure participation and engagement at all levels of the organisation was seen to be crucial. Communication was a commonly-cited

implementation failure in the literature. However, the survey analysis showed that through meetings, intranet, workshops and awareness-raising sessions, staff had become both engaged and aware of the results. The case studies revealed that there was an important need for the organisation to recognise, accept and create a common understanding and language, for change and improvement, which should be done through effective communication.

8.12 In the majority of case studies the Rapid Improvement Event (RIE) or Blitz approach had worked effectively to **motivate, encourage and develop an understanding of improvement** within staff and management. This improvement was viewed in terms of flow, process, customer value and reduction of waste and non-valued activities. Within this approach there was a focus on implementation which was a key way of overcoming scepticism and building commitment to change.

8.13 Some of the outcomes of this approach had been excellent both in terms of tangible and intangible results. This approach and outcomes highlighted engagement with the principles of Lean as defined by Hines et al (2004) (Figure 1.1). Although, the results also showed that the tools of the Lean toolkit (as in Figure 1.1) were rarely used.

8.14 The RIE/Kaizen approach was described as 'tactical deployment' of process improvement in the literature and by the management consultants. They also suggested that process improvement was time consuming and resource intensive so, to achieve long-term sustainability of an approach and the implementation of improvements, the process improvement should take a **strategic approach.** This would allow Lean to be linked to broader objectives so it drives change, including improving the customer experience and promoting a lasting culture change.

8.15 **Timing** can also be considered as an important success factor for three reasons. Firstly, management must set realistic timescales for change programmes. Secondly, momentum for change, once established needs to be maintained:

> *"We continue to review – quick wins have a short shelf life." (CS4)*

8.16 Thirdly, 'threats' need to be quickly turned into opportunities:

> *"It is clear that a single event … caused the initial spark that made a Kaizen Blitz an appealing approach." (CS2)*

8.17 **Team working** was used by all the case and pilot studies in the improvement analysis stage i.e. the RIE or Kaizen event. Multifunctional and cross-hierarchical teams were used to assess, analyse and improve a process. The findings indicate that constitution of these teams was important to generate both buy-in from the participants and the staff who were involved in the process under investigation. Team work was reported by some case studies as an important element to drive the implementation of improvements sometimes represented as temporary or virtual teams or as permanent departmental teams.

B. Barriers

8.18 Through the case studies a wide range of barriers to successful improvement programmes were identified, including:

- People
- Lack of ownership
- Identity of improvement team members
- Failure of leadership
- Compartmentalisation
- Weak link between improvement programmes and strategy
- Lack of resources
- Poor communication.

8.19 The most commonly-reported barriers to improvement across all case studies were those posed by **people** at all levels of the organisation. At the staff level, scepticism was expressed about change programmes, especially about them being the latest management fad, and a feeling that they would not be listened to and that nothing would change. In one case this scepticism boiled down to the attitude that 'it was all about money' and cost reductions. Although the results clearly show that headcount and cost reduction was not a primary objective for any case study.

8.20 Managers, and "middle" managers in particular (often service heads), were accused of **lack of ownership** of the improvement process by either not understanding the processes they were supposed to be managing, not being willing to look outside their part of any process, or being too focused on operational matters to look at process improvement. Professionals, especially in health, expressed similar attitudes:

> *"My job as a doctor is to just make sure that the patient gets better. This is more of a management exercise" (CS1)*

.

8.21 This lack of ownership also led to **poor selection of improvement team member**s. Comments were made that in some cases the wrong people were involved in the improvement programmes and not the people *"really doing the job"*. There were also clear cases of disengagement by those who should have been involved pleading time pressures, and attempts at undermining the process by those who did attend. As one of the facilitators put it:

> *"The ones who did want to get involved did so." (CS7)*

8.22 Although it is desirable to have a team made entirely of willing volunteers, reliance upon a few that get involved does contain some risks. In the pilots, there were a few examples of complaints that some people were not representative of certain departments or disciplines. The literature also provides examples of teams being over-powered, with too many middle managers involved in activities instead of front-line staff. Lack of involvement also risks the scalability of Lean, especially if the programme is reliant upon professional representation, e.g. in healthcare or legal service. In these cases, the few volunteers can be overstretched.

8.23 **Failure of leadership** was cited by many as a barrier. Those participating were not always clear about what was really driving the change, the parameters of what could and could not be changed, and what commitment senior management had made to implementing proposals. As suggested in the success factors, management needed to set the tone for the whole improvement process and the failure to implement changes was seen as a lack of commitment by management to face up to resistance and drive changes through.

8.24 There were many comments about the "silo" culture of the organisation under consideration and, specifically in the two local government case studies **compartmentalisation** was cited as a barrier. This organisational issue posed the difficulty of trying to develop a more process-oriented, customer-focussed approach.

8.25 In one case there were concerns that performance indicators, by which organisations were judged externally and on which some managers' performance-related pay was based, did not reflect the values of customer focus; rather, they supported a departmental approach. The departmental approach was also cited by some cases due to the "command and control" culture.

8.26 The research also highlighted that the **link between improvement programmes and the organisation's strategy** was weak and that this could hamper the embedding of a culture of improvement into the organisation longer term.

8.27 A number of case studies cited a **lack of resources** for the improvement programme and to implement changes as a barrier to change. In at least one case the scope of the process improvement was trimmed to take this into account. There were also concerns about the lack of capacity, knowledge, experience and skill to drive and implement improvement.

8.28 As well as the barriers mentioned, some others also emerged or were found in the research which can be considered to be the reverse of the success factors. For example, **poor communication** was often blamed for failure of improvement programmes and to develop a culture of continuous improvement. Problems included the use of jargon, lack of a clear message about improvement, and over-control of information released. Linked to this, some sites mentioned that they needed to avoid the feeling of 'initiativists' by communicating yet another initiative. Within the survey the most frequent barriers to avoid were reported as **organisational culture**, a **resistance to change** and **lack of awareness or knowledge** of Lean.

C. Summary

8.29 This final section will draw together the findings from the research in order to answer both the objectives and four key questions. It will do this by integrating responses were appropriate to ensure that all are responded to.

What is the evidence from Scotland about the use of Lean in the public sector?

8.30 The research provides strong evidence that Lean can work within the Scottish public sector, conditional upon an effective approach to implementation. Scottish public sector organisations can use Lean to focus on developing more seamless processes, reducing waste, improving flow and developing an understanding of customer value.

What approach to Lean is being used in the Scottish Public Sector?

8.31 Two models of Lean implementation were described: rapid improvement and full implementation of the philosophy. The majority of case studies focused on the former ("Kaizen Blitz") approach, which uses rapid improvement events to make many small, quickly introduced changes. The Blitz approach was cited by line managers as favourable as it provided a faster return for effort, was more visible and challenged existing management control styles to a lesser extent. It was also evident that this approach brought favourable outcomes in terms of impact on the process and engaging staff in improvement activities focusing on flow, process, customer value and reduction of waste.

8.32 However, the research also noted that the rapid improvement approach was not considered by some consultants as the most effective method of implementing Lean. A fuller implementation taking a more longitudinal, developmental approach was favoured to allow the establishment of a sustainable Lean capability. Although RIEs may be used at times from within a full implementation, the evidence showed that RIEs implemented in isolation did not achieve the same potential.

8.33 The evidence from the case studies and literature highlight the key strengths and weaknesses of the two approaches, illustrated in Tables 8.1 and 8.2:

Table 8.1 The Rapid Improvement Approach

Strengths	Weaknesses
Can focus on tangible objectives Immediate benefits Less of a challenge to management style Intensive approach diminishes resistance to change Low investment in time and cost Immediate impact on service quality	Does not affect all staff Partial involvement Lack of overall visibility Potential lack of sustainability Does not cover all improvement possibilities Shorter, simpler projects only May not help embed culture of continuous Improvement

Table 8.2 The Full Implementation Approach

Strengths	Weaknesses
A complete cultural shift Massive improvement potential Sustainability of the changes Whole system change Can link changes with strategy	Bigger implementation challenge Longer project timescale Slower achievement of main results Greater potential for resistance Less fit with existing management styles Can lose site of where it's going

What factors make sites suitable for Lean?

8.34 Drawing from all elements of the research, the most suitable sites to date have had high volume, repeatable tasks that allow greater standardisation and integration, supported by a less hierarchical management structure that allows empowerment and engagement of the workforce. Careful consideration of the suitability of sites is needed before a Lean initiative is launched, otherwise there is a high risk of failed implementation.

8.35 While all the case studies reported success in process improvement, five cases claimed that this work was helping to drive the organisation towards a culture of continuous improvement. In the other three cases, the improvement process was more instrumental,

helping the organisation to meet short- to medium-term management objectives. While these cases can be classed as successes in their own terms, it is not clear how sustainable their approach might be and how effective they can be if the exercise does not fundamentally change the way the organisations function.

8.36 Some sites are potentially unsuitable for Lean if the organisation is not in a state of readiness for Lean. Organisational readiness is a mix of many factors, including the acceptance of the need to change and the ability to develop a change capability. The notion of organisational readiness together with its factors and characteristics have not been reported significantly in earlier literature.

What factors are relevant to the development of readiness for Lean?

8.37 There is no doubt, based on the evidence of the case studies and pilot studies, that the Lean approach can be used across a wide range of organisations and processes. However, in order for Lean to occur three key factors under the concept of 'organisational readiness' are necessary:

- An awareness or realisation for the need for improvement
- The capacity within the organisation to deal with change
- An organisational culture which is receptive to understanding the customer and process analysis and is able to use data to drive improvement.

8.38 The research shows that all cases studies had a common understanding of why the organisation needed to change. Also they could report what the drivers and outcomes were which the organisation needed to achieve through the improvement process. However, in some cases, whilst there may have been an awareness of the need for improvement there was not always a general culture of improvement.

8.39 The more 'successful' public sector organisations also appeared to have, and planned the capacity for, improvement by having the managerial commitment for driving the improvement process, the in-house skills to manage the improvement process, and staff knowledge and skills to participate in the process and implement the changes.

8.40 Case studies brought their previous experience of change which ranged from no previous experience of improvement or experience, to previous initiatives that had failed. This experience allowed the case studies to prepare the ground for the current improvement process.

Which Lean tools and techniques worked in the Scottish public sector?

8.41 The evidence from the survey, case studies and pilot studies highlighted that, to date, a complete tool-based approach to Lean implementation in the public sector has not taken place. However, what was evident was an engagement with the principles of Lean and limited use of its range of tools. Particularly, four concepts underpinned much of the improvement work across the case studies, although, they were often expressed in different ways:

1. Demand and value analysis – This broadly meant trying to understand the needs of the customer or end user of the service, both by analysing patterns of service to define volume and by direct consultation with them to define service quality.

2. Waste elimination – Looking at what adds value, from the customer's perspective, and taking out any steps or activities which did not add value. By eliminating waste case studies reported on having a better understanding of flow, process and the customer.

3. Process improvement – This meant looking at a service as a whole process from the customer's perspective rather from an organisational point of view in order to help identify customer value and waste.

4. Team working – occurred in many case studies, more in the process of analysis than as part of a solution. However, in some cases the process improvement implementation resulted in having to establish teams, or improve the working of existing multifunctional teams, or creating 'virtual teams' to drive the improvements within the organisation.

8.42 The first three principles were repeatedly noted as a means by which Lean had been successful in generating an understanding of customer value, flow, process and the need to reduce waste in the Scottish public sector.

8.43 The most ubiquitous (and successful) tool was process mapping in a variety of guises. Other tools used were process capability, time observations and cellular layout. Many case studies resisted the idea of a 'Lean toolkit' and so used a much more analytical approach to inform the improvement process.

What types of issues were being tackled by the Lean initiatives?

8.44 Every case study had its own reasons, some external, others internal, for embarking on an improvement programme. These included:

- Introduction of new ICT
- Commercial competition
- Efficiency - more work for the same resources
- Poor processes and financial problems
- Improving the customer experience – and meeting a national target
- Becoming more customer focussed
- Getting more for less through process improvement and staff empowerment
- Changing policies

8.45 Linked to these drivers, for some cases, were specific outcomes and targets, representing the way in which the problem was presented generally at a process level but sometimes feeding up into a higher level target. For example:

- Speeding up processing time for a planning application

- Reducing the time taken for a patient to be referred between two departments
- Simplifying the process of responding to a report of an abandoned vehicle
- Doubling the caseload with the same number of staff
- Effective implementation of a new ICT system

What lessons are there for successful implementation?

8.46 The main lesson to be learned from the case studies is that there is no single right way of implementing improvement programmes in public sector organisations. However, although some factors support a successful implementation (see critical success factors), others should be avoided (see barriers).

8.47 The commentary to one of the health case studies neatly summarises the key critical success factors in implementing Lean thinking effectively:

> "Care should be taken to **include the people** of the organisation during Lean transformation for successful implementation. As continued success of the Lean initiative **requires a cultural change** within the organisation and this may need **continuous organisation learning**. Also Lean cannot be implemented as a stand alone and **the aims of the Lean transformation have to be in line with the strategic goals** of the organisation." *(CS1)*

What are the benefits of Lean?

8.48 The evidence from the Scottish public sector indicates that Lean should be used as a means to achieve greater output, faster, with higher quality, with the same resource, rather than a method of rapid unit cost reduction to release cash or create job losses. The evidence also shows that it gives front-line staff a better understanding of the end-to-end service delivery process, which increases morale and motivation, and better customer focus.

D. Conclusion

8.49 **Can Lean work in the public sector?** Yes it can, but Lean in the public sector was found not to be the adoption of Lean from manufacturing. Scottish public sector organisations engaged with principles of Lean at an operational, not strategic, level and not through using the tools developed from manufacturing. This indicates that public sector organisations adapted the concept of Lean. Other evidence that Lean can work in the public sector was the outcomes which were, in some cases, dramatic and, in all cases, critical in developing an improvement culture. This would indicate that the time is right for public sector organisations to engage with the concept.

8.50 **So, how can Lean work in the public sector?** Lean was found to work in the public sector by focussing on the principles of reducing waste, improving flow, developing an understanding of the customer, developing a process view, often though a rapid improvement event. Through the case and pilot studies, organisational readiness was also found to be critical. The analysis suggested that organisations should consider if they have a capacity, mindset and resources and commitment for change. Finally, for Lean or improvement to be

sustained in the public sector the objectives of the programme should be integrated and linked into the strategy of the organisation.

8.51 **Can Lean be replicated?** The findings supported that Lean cannot be replicated in terms of the process outcomes. In a service environment variation exists and it cannot be removed as in manufacturing, so the focus needs to be managing variation as well as standardising the processes. However, as noted in the case studies, there can be replication of the Lean implementation methodology but even then adaptation not adoption was experienced in terms of the Rapid Improvement Event (RIE). External support and experience was used in most cases to support the implementation process.

8.52 **Can Lean embed a culture of continuous improvement?** The research clearly shows that the RIE/ Blitz approach started to generate an improvement culture and engagement with the Lean concept. Lean cannot be sustained unless continuous improvement becomes an integral part of an organisation's cultural norms. The habit of continuous improvement can only be maintained through clear communication, ownership of improvement throughout the organisation and management commitment. The case sites who were more engaged with Lean considered it not as a short term fix but a longer term approach which was part of the organisation's strategy and driven through leadership. Although the literature quotes case examples of manufacturing organisations that have sustained continuous improvement for many years using a Lean philosophy, the history of Lean in the public sector is too recent to be able to identify Lean programmes that have been sustained for many years. However, this research strongly indicates that some of the case sites and pilot sites in this study do have the potential to achieve a sustained Lean implementation and culture of improvement.

APPENDIX 1: GLOSSARY OF KEY TERMS

Flow: The progressive completion of tasks along the value stream so that a product or service proceeds from design to launch, order to delivery, and raw materials into the hands of the customer with no stoppages, scrap or backflows.

Full Implementation: The adoption of Lean across an entire organisation, to the extent that Lean practices become the norm. The process requires an integration of Lean with organisation strategy, usually achieved through a process of policy deployment. The timing, sequence and coordination of implementation activities are carefully planned to achieve the primary objective of a fully embedded Lean approach. Shorter-term targets take a secondary role.

Just-In-Time: A system for producing and delivering the right items or services at the right time in the right amounts. Just-In-Time approaches just-on-time when upstream activities occur minutes or seconds before downstream activities, so single-piece flow is possible.

Kaizen: Continuous, incremental improvement of an activity to create more value with less waste.

Kanban: A signal, often a card attached to supplies or equipment that regulates pull by signalling upstream operation and delivery.

Lead time: The total time a customer must wait to receive a product or service after requesting the product or service. In service sectors, it is the time from the beginning of the process to the end (e.g. from when a patient arrives until he or she leaves the hospital).

Pull: A system of cascading production and delivery instructions from downstream to upstream activities in which nothing is produced by the upstream supplier until the downstream customer signals a need; the opposite of push.

Rapid Improvement Event/ Kaizen Blitz: Rapid Improvement is the engine for implementing the changes (physical and cultural) that a Lean **approach** requires.

Formal Rapid Improvement (Kaizen) events are 5 days long. In addition, there is a 2-3 week preparation period before each event and a 3-4 week follow up period after each event. During a Rapid Improvement (Kaizen) event, teams of employees focus on topics with the following agenda:

Day 1: Initial training on the Rapid Improvement (Kaizen) tools, Identification of the current conditions, Application of the basic Rapid Improvement (Kaizen) tools, Brainstorm solutions, Start changes.

Day 2: Continue waste identification, Brainstorming of solutions**,** Implement changes**.**

Day 3:	Run and debug the process, continue use and application of the Rapid Improvement (Kaizen) tools, Imprint new methods on front line staff
Day 4:	Debug, Document and Standardise on new method. Demonstrate continued regular operation of improvement results
Day 5:	Present results and review open issues.

Standard work: A precise description of each work activity specifying cycle time, takt time, the work sequence of specific tasks for each team member, and the minimum inventory of parts on hand needed to conduct the activity.

Takt time: The available operations time divided by the rate of customer demand. Takt time sets the pace of the operations (or process) to match the rate of customer demand and becomes the heartbeat of any lean system.

Throughout time: The time required for a product or service to proceed from concept to launch, order to delivery, or raw materials into hands of the customer. This includes both processing and queue time.

Value: A capability provided to the customer at the right time at an appropriate price, as defined in each case by the customer.

Value stream: The specific activities required to design, order, and provide a specific product (or service) from concept launch to order to delivery into the hands of the customer.

Value stream mapping: The identification of all the specific activities occurring along a value stream for a product or product family (or service).

Valuable: In value stream mapping, step in a process is valuable if it creates value for the customer.

Waste: Anything that does not add value to the final product or service, in the eyes of the customer; an activity the customer wouldn't want to pay for if they knew it was happening.
The 7 manufacturing wastes are: Transport, Inventory, Motion, Waiting, Overproduction, Over-processing and Defects.
The 7 service wastes are: Delay, Duplication, Unnecessary Movement, Unclear Communication, Incorrect Inventory, Opportunity Lost and Errors.
A further waste that can be added to both manufacturing and service is 'not using the minds of the employees.'

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APPENDIX 3: INTERVIEW SCHEDULE

Evaluation of Lean Thinking in the Public sector
Case Studies August 2005 –January 2006
Interview outline/schedule

Location
Name
Job Title
Interviewer
Date

Introduction

Thank-you for agreeing to take part in this research that Warwick Business School is conducting on behalf of the Scottish Executive. The aim of the research is to examine the suitability and impact of advanced operations management methods that have been used within public sector organisations particularly in order to improve process flow[12]. The work has been commissioned so that the Scottish Executive can make decisions about the development and use of Lean Thinking as a possible efficiency improvement methodology.

We are especially interested in understanding how you have improved your processes and the sustainability of these interventions. We are looking at both the content of what you have done and the process by which it has been implemented.

- Use of tape or video
- Open by inviting interviewee to briefly describe their job and role
- Reference to anything of interest in background documentation

The first few set of questions (sections 1 -4) relate to the organisation/ department in general in terms of its approach to change and improvement programmes as well as its culture and structure. The second half (sections 5 – 7) refer to 'Lean' directly understanding how it is defined, what projects have consisted of in terms of 'Lean' and why and, how has 'Lean' been implemented and then monitored and assessed in terms of outcomes.

[12] Note that we are using a very loose definition of 'Lean' – essentially looking for good practice of process/ operations improvement that has allowed reduction of waste, improvement of flow and better concept of customer and process view.

1. Contextual Factors (This section focuses on the organisational context, history and structure relating to change/ improvement projects and initiatives)

- Please describe the 'Lean' or 'Improvement' projects/s that you have been involved with that have focused on process improvement/ flow.
- What were the critical incidents or crises that sparked the change?
- What are the current key challenges facing the organisation?
- Are there any particular reasons why the organisation is facing forces for change at the moment?
- Are there any specific Government initiatives that are currently pertinent in encouraging improvement or change projects?
- Please describe any other improvement or change projects that the organisation has embarked on in the past (e.g. job development, IT projects)

Pick Ups
Is the 'Lean' project having to fit in with a larger scale programme where methodology, strategy or objectives are "given"? Who has championed the change? Is the 'Lean' project seen as a short-term or developmental process

2. Organisation Strategy (This section focuses on the organisations understanding, awareness, approach and process of developing strategy)

- How would you describe the organisations approach to strategy?
- How well developed is the organisation in terms of its work on strategy?
- Describe the formal strategic planning process
- Who is involved in strategy?
- Who are the usual dissenters of the strategy? (issues of clinicians versus managers, elected members versus managers etc..)
- Are there any links between the strategy and the improvement activities/ initiatives?
- Is there a defined "operations strategy"?

Pick-ups
Get a copy of the strategy if possible/ what is the strategy?? How realistic are the objectives for the strategy? Are timescales seen to be realistic? Has there been any policy deployment? Does 'Hoshin Kanri' mean anything to you? Have stakeholders been involved in the strategy process? How publicised is the strategy?

3. Organisation Readiness (This section focuses on the extent which the people in the organisation and the organisation itself understands, is aware of, any problems, issues, change or improvement programmes and projects.)

- Do you feel that there is an awareness that improvements need to take place within the organisation/ department?

- Does everyone accept that problems/ issues exist?
- Are the problems./ issues made visible?
- Is there a critical mass of people who are able to take responsibility to improve the processes?
- How are improvement processes/ problems analysis managed? (What level of resource is usually committed?)
- Is the organisation experienced at improvement?
- How extensive is/was team-based working?
- How would you describe the organisations middle management?

Pick-ups
Are there issues with professionals? What training has already taken place as part of professional development or graduate management development? Can the "culture" be described? Extent and breadth of improvement projects.

4. OD perspective and Potential Organisational Barriers (This section focuses on the awareness of the level of barriers/ issues within the organisation)

- Is there a "customer" focus within the organisation?
- Is the organisation "process-based" or departmental? (get evidence if possible – organisational charts)
- Do people have a systems/ process perspective? (get examples)
- What quality measurement systems exist?
- What team-based working is part of a normal day?
- Describe improvement tools and techniques that are used within the organisation.
- Which current processes do you think are, and are not, capable of delivering what they intend to do? (Why? And what is being done about the poor ones?)

Pick-ups
Can they provide copies/examples of quality records? What "market research" evidence is there about customer needs? How do they define quality and quality improvement tools and techniques.

5. Lean thinking content (This section focuses on how they define and consider Lean and what they think the organisation or projects have done related to it)

- How do you define the term "Lean thinking"/ "kaizen" / "systems improvement"?
- Which elements of the concept are most important for you?
- Which aspects of Lean do you think have been tried within the organisation?
    - Get a list of concepts, tools and techniques, projects etc.. that they feel have been used related to 'Lean'

Pick-ups
Which ideas have worked best and why? Are some ideas more relevant? Are some tools and techniques irrelevant/ unsuitable?

6. Implementation (This section focuses on how the improvement or Lean concepts have been implemented – there maybe some overlap with section 1)

- Who has been involved in providing the training and development for the improvement or 'Lean' projects?
- Describe the implementation strategy that has/ is taking place?
- What timescales are involved?
- How has the project been communicated?
- What proportion of the workforce are involved?
- How resource intensive was implementation for both participants' time and central support?
- How politically sensitive were/ are the changes?
- Did Lean have a good message to sell? Do you think that people could engage in the concept?

Pick-ups
How were change management issues addressed? How were dissenters dealt with? Are there areas where change is more patchy through implementation issues? With hindsight, how much time is really needed?

7. Outputs and Outcomes (This section focuses on the actual outputs and outcomes of the 'Lean'/ improvement project)

- What outcomes were set for the project at the start?
- Have/ were the objectives been achieved? (get examples)
- How has/ are the outcome been measured? (get examples and any paperwork if possible)
- Have/ Are the changes been sustainable? (get example)
- Have some changes showed initial success then faded? (get example)
- Would you say that the process/ processes are now more efficient? Why?
- Have the changes addressed strategic performance, e.g. speed, quality etc.?
- How has/ did the project affect the rest of the organisation?

Pick-ups
Do they have SPC charts? If so, get some examples. Has measurement continued after the initiative? Are there hidden benefits? Are there benefits for the taxpayer? Have they scaled up the approach? Are they planning to?

ANNEX 1 LITERATURE REVIEW

CONTENTS

Executive Summary

Through the analysis of over 80 articles from mainly academic but also practitioner sources this literature review presents an overview of the writings of "Lean". This analysis leads to some main findings from the literature review:

Can Lean Work in the Public Sector?

- Lean is making a transition from the manufacturing sector to the service and public sectors.
- There is little doubt of the applicability of Lean to the public sector. Many of the writings indicated that many of the processes and services within the public sector can gain greater efficiency by considering and implementing aspects of Lean.
- However, there is still little evidence of the complete Lean philosophy being applied in the public sector so it is not possible to state completely that it can work in the public sector.

How does Lean Work?

- Lean can be considered in the broadest sense to be a philosophy, which aims to develop good practice of process/ operations improvement that allows a reduction of waste, improvement of flow and better concept of customer and process view through a culture of continuous improvement involving everyone.
- The writings on Lean thinking promote it as a different way of looking at organisational processes requiring the workforce to consider things from a customer point of view. It is argued that by doing so, the flow of information and customer contact through the process is enhanced.
- From research findings discussed in articles implementation should include as many people as possible from the organisation and also customers during the transformation process in order to achieve a cultural change within the organisation.

Can Lean Thinking be replicated?

- To date the majority of the writings on Lean have been focused on the manufacturing sector with some examples of service becoming available. There is little empirical research on public sector organisations related to the complete implementation of Lean although there is indication that this is starting to grow.
- Tools and techniques associated with lean are being used in different parts of the public sector, e.g. healthcare, to remove non-value added activities and waste from the systems.

Does Lean Thinking embed Continuous Improvement?

- Continuous Improvement is an integral aspect of the Lean approach. However, discussion in literature indicates that Lean Thinking should not be interpreted as a short-cut route to the development of a CI culture.
- Drawing from the lean writings barriers to Lean, particularly in the public sector, include culture, lack of clear customer focus; too many procedures; people working in silos; too many targets; lack of awareness of strategic direction; general belief that staff are overworked and underpaid; dominance of stakeholders; lack of understanding of the effect of variation, systems thinking and process flow.

1. Introduction

The aim of this report is to outline a review of the existing literature on "Lean" between June and September 2005. This report presents a summary of the key points from the literature, with an emphasis on drawing out some conclusions of what this implies for those organisations undertaking Lean projects in the public sector.

The review starts by looking at theoretical developments in the concept of Lean. Section 2 of the report defines the key terms of Lean and associated tools that are used in this review. Section 3 provides an overview of the key points from the literature detailing the implementation of Lean in manufacturing during the 1980s and 1990s and also more recent literature looking at the implementation of Lean in the service and public sectors. The section also highlights the key points from the literature, which can be considered to inform developments in the public sector. There is a strong emphasis on research in health services, which is the main public sector area where there is a significant amount of literature. Section 4 provides brief information on some of the tools, techniques and approaches that are associated with Lean.

Within this report there is a number or a set of numbers in brackets that follow the key points from the literature. These numbers should be cross-referenced to the specific data source listed in Appendix 2 to determine the source of information.

Appendix 1 outlines associated tools and techniques (both those directly part of the Lean approach and those related) which were considered in the literature search. Appendix 2 of the report describes the approach adopted by the researchers to determine the relevant articles and the key points from the selected literature. A "Data Extraction Sheet" (DES) for each source listed in Appendix 2, which provides more details on each piece of literature, is available on request from the Scottish Executive.

2. Definitions and Concepts

The definition of Lean Thinking used is:

> *"Specifying value by specific products, identifying the value stream for each product, make value flow without interruptions, let the customer pull value from the producer, and pursue perfection*" (43, 64)
>
> *"Leanness is seen as an ideal to be pursued not a system to be implemented. It should be considered as dynamic and a journey rather than a fixed point that has no final destination"* (23, 44).

However, it should be noted that although for the purpose of the literature review the definitions of Lean being used are the ones frequently cited but, for the purposes of the project, the definition is expanded to include any good practice of process/ operations improvement that allows reduction of waste, improvement of flow and better concept of customer and process view. Considering this view of Lean, it is possible to draw on ideas from concepts such as Just In Time (JIT)[13], Total Quality Management (TQM)[14] and Business

[13] The definition of Just In Time (JIT) used for this study is: *"A philosophy of making when needed and directed towards the elimination of waste, where waste is anything which adds cost, but not value to a product"* (43).

Process Engineering (BPR)[15] particularly related to research that has been carried out into their implementation within organisations. We can, therefore, consider the notion of "Lean Principles" or a "Lean Philosophy", which relates ideas and concepts whose fundamental ideas lie in continuous improvement, elimination of waste, process flow and systems thinking developed throughout the organisation.

The proponents of Lean Thinking emphasise the scale of the opportunity to eliminate waste. The following quote is typical of those seen within the literature:

"Half the human effort in the factory, half the manufacturing space, half the investment in tools, half the engineering hours to develop a new product in half the time. Also, it requires keeping far less than half the needed inventory on site, results in many fewer defects, and produces a greater and ever growing variety of products" (43, 66).

The actual scale of the improvement possible through the adoption of Lean Thinking is highly debatable and clearly contingent on the starting point for any lean initiative. Hence the scale of improvements achieved in other economic sectors might be more or less than that seen in specific manufacturing companies.

3. Review of Literature

3.1 Overview / History of Lean

3.1.1. Lean Manufacturing

This first section aims to give an overview of both the history of Lean and the development of the concept. The term "Lean" was first adopted in the 1980s (66) as it was claimed that the implementation of Lean practices resulted in using less of everything (e.g. raw materials, labour, time, etc) compared to mass production. The Lean concept was based on the Toyota Production System, which was developed in the 1950s after World War 2 (10, 38, 66). It was introduced as an alternative to mass production techniques in the Toyota factory and led to raised productivity and quality levels by allowing the flexibility of "skilled" production with the volume efficiencies of "mass" manufacturing. The core characteristics of the Lean Manufacturing can be described as (38):

- Team-based organisation involving flexible, multi-skilled operators taking a high degree of responsibility for work within their areas.
- Active shop floor problem solving structures, central to continuous improvement activities.
- Lean operations, which force problems to be surfaced and corrected.
- High commitment human resource policies, which encourage a sense of shared destiny.
- Close, shared destiny relations with suppliers, typically in the context of much smaller supply bases.
- Cross-functional development teams.

[14] The definition of Total Quality Management (TQM) used for this study is: *"The management of quality at every stage of operations, from planning and design through self-inspection, to continual process monitoring for improvement opportunities"* (43).

[15] The definition of Business Process Re-engineering (BPR) used for this study is: "*The logical organisation of people, materials, energy, equipment and procedures into work activities designed to produce a specific end result*" (7, 43)

- Close links to the customer.

Studies into the adoption of Lean practices in Japanese vehicle manufacturers have concluded that these companies have superior performance in terms of productivity and quality when compared to their European or North American counterparts (38, 39, 66). However, even though European and North American manufacturing companies have taken on board some of the principles (39, 49, 50, 66) very few have evidence of all aspects of the Lean Manufacturing model.

3.1.2 Lean Service

There has been literature with evidence of the transfer of manufacturing concepts to the service sector since the 1970s arguing that service characteristics are not an excuse for avoiding manufacturing methodologies as a means of efficiency gains (6, 29). Some studies argue that any organisation can gain substantial benefits including improved quality, reduction in costs and increase responsiveness from at least some new practices (57). Indeed supermarkets have been adopting Lean techniques for improving the flow of customers for many years (51). There are strong benefits that can be gained from implementing Lean whatever the size or sector of the organisation (19, 41, 50, 51).

3.1.3 Lean Enterprise

During the 1990s, the Lean debate moved away from best practice production techniques in automotive to other techniques / approaches and sectors. The Lean concept was extended to develop the "Lean Enterprise" which is defined as a group of individuals, functions, and legally separate but operationally synchronized companies (65). Lean Enterprises join together all the 'value-creating' activities from all the organisations and use Lean technologies and techniques. It is also claimed that the development of a Lean Enterprise aids the stimulation to innovate (48).

3.1.4 Lean Thinking

From Lean Enterprise came the idea of "Lean Thinking", which took the Lean idea further and is described as having five principles (64):

- Specifying value by specific products.
- Identifying the value stream for each product.
- Making value flow without interruptions.
- Letting the customer pull value from the producer.
- Pursuing perfection.

The five principles of Lean Thinking have become the foundation to Lean and can be used in relation to all notions of Lean, Leanness and Lean principles. However, some writings focus on the organisation (as in Lean Manufacturing or Lean Service), the supplier (Lean Supply) or customer end (Lean Consumption).

3.1.5 Lean Supply and Lean Consumption

"Lean Supply" literature focuses on the need for closer relationships between customers and a small base of suppliers as a key characteristic (27). Lean Supply considers the entire flow from raw materials to consumer, recognising that there is a cost associated with any departure from perfection in undertaking the tasks necessary to provide long-term customer satisfaction (27). "Lean Consumption" requires the integration and streamlining of the process of provision and consumption (63). The challenge is for service providers to consider total cost

from the standpoint of the customer and to work with customers to optimise the process of consuming.

3.1.6 Leanness

Considering the fundamental ideas of Lean Manufacturing and Lean Thinking it is possible to develop the concept of Lean ways of working or Leanness, which can be equally well applied to a number of other 1990s management doctrines like BPR and TQM (52). There are three common reasons for introducing Lean ways of working; to cut costs, to promote efficiency and to support growth and innovation (52). Using the muscle, fat, etc, connotations of the Leanness concept, it has been suggested that what is needed is "fitness" or "strive to be fit" (52). Some organisations have embraced the notion of Leanness by adopting new working practices, including teamworking, project leadership, self-directed teams, empowerment, outsourcing, flexible working and the learning organisation.

3.2 Lean in the Public Sector

3.2.1 Lean Evidence in the Public Sector

This section particularly focuses on the evidence of Lean in the public sector, drawing on relevant ideas based on Lean Service. This evidence outlines how there are substantial efficiency gains to be made from the introduction of Lean practices and techniques in the public sector with improved customer service, quality and reduction unit costs (42, 30) as well as better planning of service operations (28). The public sector should look to manufacturing to learn about Lean, and although Lean will have to be modified to suit the peculiarities of these sectors, the principles are the same as are the lessons regarding the configurations of systems (21). However, some argue against this suitability of Lean practices outside of high volume manufacturing (17). In addition, other writers have stated that Lean ways of working are affected by the organisational context into which they are introduced (i.e. size, sector, union presence or absence, greenfield/ brownfield site and legal framework) so Lean or Leanness is not a homogeneous or invariable concept but a context-dependent process (44).

3.2.2 Lean Application in the Public Sector

Lean principles have been adopted in various public sector organisations, although the way that they have been implemented differs depending on the organisation. This includes for example, the use of Lean production, flow, kaizen, process and value stream mapping, standardising systems and root cause analysis in hospitals to improve emergency care services, intensive care units and operating units and to reduce waiting times (1, 47, 55, 67). However there are still few empirical studies on the implementation of Lean in the public sector within both academic and practitioner literature. Some studies have been undertaken in the US on related Lean principles, which have concluded:

- There is a lack of empirical research documenting the JIT experience in the public sector. This can be attributed to the lack of such experience and its relatively new adoption (69).
- That the public sector appears to be behind manufacturing and service organisations in terms of utilising innovative operational practices such as JIT, TQM and automation (70).
- That where hospitals are trying techniques first used in manufacturing as a means of improving performance, there are no examples of a hospital that has achieved comparable large-scale transformation (71).

A study assessing the suitability of Lean Thinking in the UK health service looked at how a performance measurement system called the "flow model" was designed to identify key performance indicators that measure changes towards Lean Thinking (26). The study concluded that Lean Thinking is applicable in health care settings, and that the flow model is a suitable tool for following up these initiatives. This has practical implications for health care practitioners, who may use the findings to develop measurements of the outcome of Lean Thinking initiatives on existing care processes. However, it is argued that the flow model needs to be balanced with other measurements in order to receive a complete picture of Lean Thinking performance (26). The same study also reported similar findings in a study of the Swedish health care system (26).

In the UK, there are organisations aiming to develop and introduce the principles and practices of system thinking in the public sector. These organisations specialise in the translation of these ideas into service organisations, and have developed the term "Lean Service" (46). Using the experience and knowledge gained in local authorities, police forces, fire services and housing associations, the improvement of one particular system may be used to improve systems in other processes and departments. Every local authority has similar administration processes across different departments. If the time to make decisions can be halved and the service improved in one department, the same principles might be used to improve others.

A recent study [73] of the use of Lean Thinking to improve Social Housing revealed 80% reductions in the time taken to process repairs, a 40% reduction in the time taken to collect first rental payments, a 50% reduction in the number of steps needed to re-house and a 50% reduction in void time. This was all achieved with both significant cost reduction and improvement to the customer experience. The main caveat of this approach is that it took a "systems" approach to the implementation of Lean, which some people may regard to be a significantly different version of the approach conventionally applied.

3.2.3 Relevance of Lean in the Public Sector

Despite the lack of concrete empirical examples of successful implementations in the public sector, some researchers do believe that non-manufacturing organisations can reap rewards from Lean approaches if they look past the manufacturing-associated labels and utilise the underlying concepts (2). The essential requirements of any organisation, which might want to take advantage of these techniques, are patience, support from top management, and the presence of a change agent/champion.

However, again others have questioned the application of the Lean philosophy within the service industry. Some key criticisms have included (17):

- Human aspects: Lean systems can be seen as exploitative and high pressure to the shop floor workers. The long-term sustainability of any Lean programme is dependent on the human dimensions of motivation, empowerment and respect for people.
- Scope and lack of strategic perspective: There is a lack of discussion of strategic level thinking in Lean programmes leading to a lack of sustainability of many Lean transformation programmes.
- Lack of contingency: Lean thinking may encourage organisations to remove buffers which may not always be in use but are necessary for occasional or unforeseen factors.
- Coping with variability: Various Lean approaches manage variability and create capacity by utilising assets more effectively. In many sectors however, as demand varies the

ability of Lean production systems and supply chains to cope can become the main inhibitor to the implementation of Lean.

- Over-standardisation: Service organisations are under pressure to meet individual customer needs and standardisation of services to fit the Lean model can lead to accusations of "McDonaldlisation".
- Inflexible and fragile: A truly Lean system lacks flexibility in terms of `space to experiment' and `time to think'.
- Unable to deal with uncertainties: Higher levels of Lean can remove essential levels of organisational slack, which are required to deal with uncertainty. It gives preference to efficiency over robustness and system reliability.

In some respects the evidence that critiques Lean is probably greater than the evidence that proclaims the scale of improvements using Lean, mainly due to the lower levels of vested interest by those generating the criticism. However, the evidence tends to be case-based and does not involve extensive empirical data.

3.3 Outcomes of a Lean Approach

This section presents the possible outputs and outcomes that have been and can be achieved through the implementation of Lean. Due to the majority of writings and studies to date being in manufacturing organisations then the initial material presented in this section relates to manufacturing. However, as indicated in various sections above and some evidence below some writers indicate that equal, if not more benefit, can be gained in the public sector. By presenting the outputs and outcomes of Lean in manufacturing and service it can become a useful benchmark of possible achievement that can be attained. Although, of course, it should be noted that other writers claim that a like for like comparison should not be made due to issues of context and customer requirements. From an academic perspective, the standard of the direct evidence is quite poor, with carefully selected case studies being used to promote benefits without a balanced view of the negative aspects. The work has never really established whether other factors, such as the advances in IT capability, have made a difference.

3.3.1 Successful Lean Implementation Programmes in Manufacturing

Common themes running through successful Lean implementation programmes in manufacturing are (32):

- Receiving assistance to prioritise, select and define the focus and boundary of the improvement programme.
- A high level of expertise in delivering implementation programmes using Lean practitioners with hands on process improvement expertise and relevant production management experience.
- Going for quick wins is popular and does actually work.
- Integrating accredited training and workforce development, change management and rapid improvement techniques.
- Organisations use operational measures to quantify the success of their Lean programme, with an investment of £20,000, report it delivering benefits of £100,000.
- Networks and sharing of learning has been an important way of gaining information and knowledge on Lean.

The main qualitative results from surveys of manufacturing companies are (32):

- Vastly improved customer focus was the main legacy of Lean implementation and of the new organisation created.
- Successful companies conceived and executed a strategy for change to support the adoption of Lean.
- The initial implementation of Lean was usually piloted on a smaller scale prior to the investment in training being made to expand Lean outside of the pilot area.
- One methodology does not fit all applications of Lean and methodologies and tools need to be flexible enough to fit a variety of programmes.
- The Lean toolbox is extensive with a very broad range of tools being used. Much of the support delivered to companies involves training in these tools and techniques.
- Support provided by specialist consultancies, public sector support agencies and FE/HE was seen as effective.
- The most common areas for the application of Lean was in the production function, production planning, maintenance, supply chain management and purchasing/procurement.
- Improvements in quality reduce process cycle time, cut production costs and were likely to improve delivery performance and customer satisfaction.
- Companies found it very difficult to report on the level of investment that they had made in order to secure the cost savings they were reporting.

3.3.2 Lean Outcomes in Public Service Organisations

Within service organisations as they go Lean, there is strong evidence suggesting that costs fall, service improves and waste is reduced. In addition, because the people who do the work have been engaged in understanding it from a different point of view and changing it, morale improves. And finally, because the system has been changed (in particular roles and measures) there is the means for continuous improvement (46). The following are quoted as examples of efficiency gains in the UK public sector where Lean principles have been applied:

- Halving the end-to-end time for planning applications.
- Halving the time for voids in council houses.
- Cutting end-to-end processing time for high demand adaptations from disabled people from over 200 days to 12 days.
- Payroll errors reduced from 75% to 2%.
- Reducing backlog in lost and found departments by 80%.
- Reducing the time taken in report production from 77 to 6 days in the Justice system (46).

There is also evidence of other benefits in the public sector (67). Using the Lean approach, some hospitals have traced problematic infections in some patients to their source, prompting changes in the way that intensive-care units inserted intravenous lines. The result was a 90% drop in the number of infections after just 90 days of using the new procedures. It also made good business because the fall in infections led to savings of almost half a million dollars a year in intensive-care-unit costs.

Reported outcomes from a kaizen blitz in another hospital case study include dramatic performance improvements by capitalising on many hands and minds working together with a common focus. This includes 97% reductions in throughput time and 50% reduction in

space required (34). The process, often led by practitioners, gives other benefits which help to demonstrate employee empowerment, development of cross-team synergies and provide lessons in best practice by actual use - e.g. process mapping.

A range of benefits were also listed in a study on initiatives, in which JIT approaches were used with the implementation of new Information Technology systems (e.g. Enterprise Resource Management) to improve business processes in a large public sector organisation (11):

Accessibility:
- 39% decrease in reference to others for information
- 56% increase in respondents indicating "frequent" or "constant" use of electronic resources

Productivity:
- 60% increase in respondents indicating a 75% or greater reduction in time required for accessing information
- 61% increase in respondents indicating a 75% or greater reduction in time required for taking action on information

Customer satisfaction:
- 95% increase in respondents indicating satisfaction with the new processes
- 94% increase in respondents indicating preference for the re-engineered electronic processes.

3.4 Lean Thinking in Practice

3.4.1 The Five Principles of Lean Thinking

This section builds on the five main principles of Lean Thinking outlined in section 3.1 to highlight the other key concepts and the content of Lean Thinking within literature. These include (20, 61):

- Managing the business from the customer definition of value.
- Creating end-to-end primary processes to design, deliver and support this value, with minimum waste, together with the appropriate support processes.
- Building a management system to develop, sustain and improve these processes over time.
- Being clear about the customer purpose before designing the processes; and then organising the people to sustain this.

3.4.2 Lean Techniques

In order to apply Lean Thinking in the public sector, the literature builds on the definition of the Lean business system and the challenge of obtaining value from each process (20, 61, 62). However due to the specific nature of the public sector, the Lean concepts may need to be transferred into a more user-friendly language (42). The standard Lean techniques and their applicability in the public service could be:

- Value. Organisations need to determine what aspects of the service are critical to quality and what are the key characteristics. It may also be useful to identify who the real customer is and better understand their requirements.
- Value Stream. Identifying the value stream and measuring how and when value is added helps to identify and remove waste. In services it can be hard to see waste, work in progress and problems.
- Flow. Adopting standard operations and identifying best practice can achieve the maintenance of a high rate of flow and quality through value chains. This allows the routine to run more smoothly, freeing up time for creativity and innovation.
- *Pull. This focuses upon the customer demand and trigger events backwards through the value chain. Thereby linking activity to customer needs. However, customer demand is not always clear in a service environment and effort is required early to understand this area (42).*
- Perfection. Striving for perfection is an important element of Lean embedding continuous improvement in the culture. Continuous improvement ensures that non-value adding activities are removed from the value chain.

3.4.3 Lean Measurement in Health Care

In an evaluation of Lean Thinking in health care, some writers (26) have used the five elements of the Womack and Jones Lean model to discuss how applicable Lean is to health care and, in particular, how measurement can be used to reflect this application:

- Specify Value - putting the patient at the centre means measures such as medical quality, waiting times and patient satisfaction are key.
- Identify Value Stream (to eliminate "wasteful" activities) - they suggest process mapping is key and the degree to which this happens is a key measure, as is the amount of time spent by medical staff on patient contact, and waste in the referral process.
- Flow - measurement might include the number of times demand for care can be matched with capacity, the ability to smooth demand by scheduling, improving flow through the use of multi-skilled teams, and transparency through information;
- Pull - waiting times and delays are key measurements of the effectiveness of this element.
- Perfection - policy deployment is key, with measures feeding into a balanced scorecard.

This study examines how well the “flow model” used in the Swedish health care system provides measures which support all five Lean principles. The study found that additional measures e.g. policy deployment, patient satisfaction and continuous improvement are needed in order to fully capture the changes towards Lean thinking. The study also suggests that designing a performance measurement system that reflects Lean initiatives is one important phase in implementing Lean Thinking in the entire organisation (26).

3.5 Organisational Readiness

3.5.1 Defining Organisational Readiness

The readiness of an organisation to take on board change, and particular concepts like Lean, are critical in allowing successful implementation. Organisational readiness is concerned with the ability of an organisation to take on board change, together with deciding which concepts to implement. It is related to organisational barriers (see section 3.7), although

readiness could be considered as the point before implementation and so before the barriers may appear.

This section considers studies on organisational readiness, drawing mainly on associated concepts such as Just In Time (JIT) and benchmarking. Lean has the potential to increase the operational efficiency, service quality and organisational effectiveness of the public sector, but there are several prerequisites for gaining such benefits. Therefore, this section will describe some ways for this potential to be achieved, related to how public sector organisations must modify their operating procedures, production systems and organisational culture. A study of the application of JIT into the public sector suggested the consideration of the following issues in order to enhance its potential success (69):

- Training of management and employees in order to create an organisational culture, which is consistent with the JIT organisational philosophy.
- Establishment of new procedures for dealing with suppliers. These procedures should define the criteria for suppliers based on quality, cost and timing.
- Analysis of operations to identify areas where standardisation, simplifications and automation are needed. Operational processes and procedures should be re-engineered based on this analysis prior to the implementation of JIT.

3.5.2 Benchmarking to aid Organisational Readiness

Benchmarking is the process of learning from others. It involves a comparison of one's own performance and/ or methods with those of others. Empirical studies provide actions that can be used by manufacturing, service and public sector organisations to reduce implementation problems and improve their chances of a successful benchmarking implementation. As the operating systems of these organisations share fundamental similarities, they can all gain significantly from cooperative benchmarking. The following conclusions are drawn (68):

- System-wide pre-JIT modifications appear to reduce the potential for JIT implementation problems. This is especially the case for public sector organisations, which should learn the lessons from the manufacturing experience.
- Pre-JIT modifications appear to enhance JIT success, especially for public sector organisations where both operations- and procedures-related modifications are associated with JIT success.
- Top management should champion the initiation of the JIT effort, while leaving involvement in the details of the implementation process to other internal constituents and external partners such as customers and suppliers.
- Organisations that follow a differentiation business strategy appear to have more success with JIT.
- Industry leaders tend to have more success with JIT than others in their industries.

A benchmarking study by a public sector organisation looked at the contribution business management systems make to achieving organisational objectives (37). The aim of the study was to improve the architecture, management, control, communication and deployment of the organisation by reviewing current best practice. The study concluded that benchmarking was not about just visiting other people but of the need to align management systems and Lean improvement programmes with business strategy (37).

3.5.3 Public Sector Experience

Drawing upon experiences in local government, the evidence suggests a need to drive continuous change through performance management through a bottom up approach (45).

There is literature on how higher education institutes can be supported towards making the transition to managing and behaving commercially while continuing to focus on the provision and continuous improvement of an effective service (7). Education of those within the organisation is proposed as a means of moving the organisation towards managing and behaving commercially without adversely effecting political ties and while continuing to focus on the provision of an effective service. However this is recognised as not being an easy task. There is also the need for the workforce within higher education institutes to trust their managers to help them understand their own organisational culture, its political frameworks and work practices, to work with them in order to build new relationships.

3.5.4 Recognition and Consideration

There has been a study looking at the standards of quality that can be expected from public services (72). This has highlighted a number of factors in improving quality where customer and suppliers influence the limiting factors. The fact that there are in-built limits can provide an excuse for doing nothing about quality. However the development of quality is an incremental and continuous process, which needs to be undertaken. Recognising and accepting these limitations means that expectations by service provider and customer can be realistic and shortcomings more readily accepted.

Other considerations that should be taken into account when implementing Lean include (40):

- The need to ensure that Lean does not mean a loss in humane aspects of work i.e. over standardisation of the process so that little human ability is required.
- Lean should be appropriate to the organisational strategy and teamwork but should also take into account the productive capacity of the organisation as well as the non-productive capacity.
- Lean should be associated with fitness for purpose.
- Lean means having the optimal amount of particular resource for the circumstance in question.

3.6 Prerequisites for Lean

In this section we explore and describe the prerequisites for Lean both in terms of implementation process and the technical content of organisation change. Section 3.6.1 focuses upon the commonly cited implementation success factors. Sections 3.6.2 – 3.6.5 consider tools, techniques and concepts that may be implemented in advance of full Lean implementation, either as prerequisites or as approaches used to test the validity of Lean in a new context.

3.6.1 Key Elements for Change Programmes

The implementation and embedding process of Lean can be considered as another critical element of the whole approach in order for the benefits to be realised. This section presents the elements that need to be considered when embarking on Lean. However, in general it has been stated that the key lessons that have been derived from implementing change programmes, which include Lean, include (49):

- Need to change existing attitudes, behaviours and practices.
- Full and ongoing support from top management.
- Need for a champion to drive the change initiatives and maintain momentum.
- Realisation by everyone that it will take a long time
- Engaging employees as much as possible in the planning, implementation and evaluation of changes (31).
- Developing an environment of openness and trust through communication and sharing information.

3.6.2 Value Stream Mapping

Value Stream Analysis or Mapping is often cited as a technique that can be used in order to decide which tools to use to reduce waste in specific circumstances (18). This involves:

1. Identifying the specific value stream to be reviewed.
2. Interviewing managers to identify the various wastes that should be removed.
3. Obtaining views regarding the complete industry structure.

Further discussion on Value Stream Mapping and Analysis is in section 4.1. However, the model claims to have a practical and research use. For research, the model can be used to operationalise Lean production to study the change process properly. In practice the model can be used to assess the developments taking place in an effort to become Lean and as a checklist for what to aim at when implementing Lean (23).

3.6.3 Kaizen Blitz

Another study has demonstrated how to implement a "kaizen blitz", which in turn implements Lean ideas in an organisation, within two days and described how to achieve dramatic performance improvement with employee buy-in through this process (34). A kaizen blitz is a rapid improvement effort that emphasises teamwork and innovation to increase employee ownership and productivity in both traditional and just-in-time cellular flow process. The process is best carried out by a cross-functional team of six to ten people - including suppliers, customers, and at least one person from outside the area under study to encourage out of the box thinking. The process includes freeing participants of any other responsibilities during the blitz and informing those working around them that it is about to happen. This is followed by:

- Recording the as-is process performance.
- Evaluating the process as it is now.
- Developing a new work combination (workflow).
- Redesigning the process flow.
- Implementing the new process flow.
- Re-measuring the new flow.
- Reviewing the results.

3.6.4 Developing a Process Understanding

A complex health care system considered the implementation of a cellular approach, where 'families' of services are grouped together, in order to re design the tasks and make their impact more visible. Therefore, the design and implementation process undertaken was a series of stages (56):

- Understanding the nature of demand volumes and seasonality
- Assessing the actual process sequence for the systematic sample of patients
- Clustering patients in segments of similar processes
- Identifying the process flow of each patient
- Designing the process flow
- Testing new flow for delays
- Assessing results and implementing improved processes

A project was undertaken using this approach to help reach the target for an Accident and Emergency department to treat, discharge or transfer 90% of patient arrivals within 4 hrs. Relating this to Lean the project was undertaken with the objective to improve care, staff satisfaction and variability in the treatment process (56).

3.6.5 Developing Relevant Training and Involvement

For successful implementation Lean practice implies a pre requisite is having the right employee in the right position. This means Human Resource practitioners need to review the reliability of their selection programmes for every level of the organisation (14). As a result, amended training needs implies:

- Replacing managerial development programmes with individual continuous development, competence based programmes, focusing on the skills individuals need as they climb the organisation.
- Broadening the training available to team members to include different processes and techniques, training in continuous improvement allowing individuals to alter their workplace and solve their own problems.
- Industrial relations may become strained through the changes and improvements caused by Lean practices. There is need for managers to create trusting and open communication with trade unions (14).

Developing a culture that creates the involvement of everyone in the organisation is a critical element of the Lean philosophy (66). Everyone in the organisation needs to be trained in the Lean philosophy concepts as well as the planning, design, implementation and evaluation of the changes so that Lean is driven by all the people, usually through teams, in the organisation not just the senior management (19, 49, 50).

However, this development of teamworking and involving everyone in the Lean approach needs to be handled carefully as it can lead to teamworking characterised by significant responsibility being given to the team leader, rather than team members, and the use of continuous improvement techniques that make marginal improvement in standard operating procedures. A set of case studies looked at the introduction of team working in the Inland Revenue in the UK (8), where teamworking was implemented to facilitate the introduction of a new tax regime in the face of reduced numbers of middle managers and clerical employees. In this study certain human resource policies and practices had an effect upon its implementation. The study concluded that because the primary motivation for introducing teamworking was economic, the scope for increasing the autonomy of team members was limited. However, the change in management style that came with the implementation meant that there was increased autonomy, but that this resided with team leaders.

3.7 Organisational Barriers

3.7.1 Summary of the Barriers to Change and Improvement in the Public Sector

Having discussed Lean in terms of its history and content this section outlines the studies of the public sector in the UK that have highlighted various organisational barriers to the successful implementation of 'Lean principles' and associated techniques. These studies have concluded that barriers to continuous improvement and increasing business excellence include (16, 47):

- Public sector culture.
- Lack of clear customer focus.
- Too many procedures.
- People working in silos.
- Too many targets.
- Lack of awareness of strategic direction.
- Lack of 'buy-in' by staff
- General belief that staff are overworked and underpaid.
- Domination by stakeholders.
- A lack of understanding of the effect of variation, systems thinking and process flow.

The studies presented in the articles in the literature review referred to many of these barriers. However, some were mentioned more than others, related to the public sector, and so are discussed a little further.

3.7.2 Lack of Understanding of Variation, Systems Thinking and Process Flow

In the literature there are debates between the role of variation reduction in the service sector in contrast to that of manufacturing (33), claiming that there is a need to accept greater variability in service outcomes and a need to develop ways of achieving necessary flexibility. A study evaluating lean techniques in the health sector examined the causes of excessive queuing in the NHS, which results in patient backlogs and long waiting times (47), suggesting that the variation between demand and capacity is the major issue. Poor understanding of this leads to ineffective capacity planning. However these studies propose to eradicate queues in the NHS by advanced access systems, which emphasise the need to properly understand and manage patient flow. Many hundreds of NHS teams are already using these principles with promising results. Given concerted leadership action, staff capability building and new systems to match demand and capacity on a daily basis, it would be possible to develop 'low wait' or even 'no wait' services across the NHS.

Under the concept of "Lean Service", system thinking requires understanding work as a system. This leads to managing flow rather than function. It requires the development of different measures and methods. If this understanding does not exist it may cause a potential barrier to full implementation and the realising of benefits which can lead to a reduction in the number of steps, in end-to-end time, in waste, and cost but, overall an improvement of service (46).

3.7.3 Lack of 'buy-in' from Staff

For the public sector similar barriers to the adoption of Lean tools and techniques exist due to the lack of the necessary skills, capability, experience and understanding (42). In studies

looking at the adoption of Lean techniques in US hospitals, the following problems were highlighted (67):

- Hospitals are not factories.
- Doctors, nurses and other hospital staffers do not think of themselves as assembly-line workers or their patients as a product under construction.
- There is a clash between the culture of efficiency and the culture of caring.
- Doctors are sceptical and do not want to be told how to do things.

There have also been attempts to develop more effective public management and more efficient public services through continuous improvement, business excellence and other change management practices in Northern Ireland (16). This has highlighted:

- Public sector management context: sector is heterogeneous, concept of customer is contestable, issues relating to the provision of services rather than goods; and the political dimension especially around definition of quality.
- Performance measurement: although attempts had been made through the Business Excellence (EFQM) model, the difficulties of measuring performance (e.g. the lack of an overall measure such as profit) have led to a lack of effective performance measurement.

3.7.4 Public Sector Culture

Specific employee-related barriers that organisations can come across when implementing change programmes, including continuous improvement and Lean principles, include the following (49):

- Making employees aware that there were better ways of performing the tasks they had been doing for years
- Changing attitudes of people in the shop floor and making them realise that waste means lost time and money.
- Developing and maintaining discipline especially getting operators to produce only the required quantities.

Educating the employees is cited as being critical in overcoming these problems.

There are particular people issues that surround Lean techniques (59), which have been mentioned in the literature. Unions see Lean techniques as intensifying the work effort, increasing management control and undermining the independence of trade unions. Kaizen is seen as appropriating workers' knowledge and employees will not work for improvements to which they fall victim. Therefore, any change needs to be non-threatening. The way to gain higher efficiency and higher quality of work and jobs is through "teamwork" and giving responsibility for standard operations to the production people. Also, eliminating waste does stretch the system and can create pressures. Therefore, the aim must be to create Lean "people-centred" production.

3.7.4 Improvement Implementation Issues in Higher Education

Studies looking into the adoption of TQM have had similar conclusions. A study into the implementation of TQM in three higher education institutions in the UK and the US, highlighted a need to develop more market-based approaches in higher education. The professional (specialist) nature of employment within universities was also seen as a challenge for team-based working (53). A survey of the practice of TQM within UK higher

education institutions provides evidence of low adoption with some differences across colleges, new and old universities (22). Some organisations did not fill in the questionnaire, explaining that they lacked the quality management processes. TQM was only adopted in academic functions only. The specific results were:

- Only 4 organisations practice TQM.
- 72.5% of organisations define quality as “fitness for purpose”.
- 5.9% of organisations show “customer awareness”.
- 31% of organisations benchmark.
- 32 reasons for quality management identified.

3.7.5 Improvement Implementation Issues in Government Departments

A case study of quality restructuring in local government and the trade union response highlighted that quality is essentially managerially driven and must be understood as part of the process of local government restructuring (13). There is no neutrality of quality management, nor can trade unions simply adopt it for their own purposes. Public sector managers and staff may have a joint desire for quality outcomes for service users but they do not share the same language of quality in relation to process. Workers’ responses to quality initiatives may contain important contradictions. There may be confusion between process and outcome, which can lead to support for quality as an undifferentiated "good thing". The actual experience of managerial quality strategies may be very different as they are often used to challenge traditional systems of job regulation.

> *Case studies of implementing TQM in government departments show that quality initiatives in HM Customs and Excise were coupled to a delayering strategy (reduction of management layers and so, managers) and in the Benefits Agency, to efficiency gains (36). This had an immediate benefit to empowerment by saving staff costs and budget-driven efficiency gains. However quality changes are part of a continuous process, and with empowerment initiatives pushed through alongside cost control measures, there remains the possibility that these improvements were driven by fear rather than by a genuine commitment to improve.*

4. Conclusions

A review of the literature on lean in the public sector finds:

- Lean is used in reference to Lean principles, **concepts and the notion of Leanness** by authors not necessarily referring to the five principles of Lean Thinking.

- The five fundamental principles of Lean Thinking are specify value, identify the value stream, make value flow, let the customer pull and strive for perfection. These have been **applied and adapted by writers for the service industry and the public sector** with particular examples for the Health Service indicating an applicability of the overall concepts for many organisations.

- There is still relativity little evidence of the complete **Lean philosophy being applied within the public sector** with the most extensive examples being in the health sector. Of the evidence presented in the current literature there appears no over whelming support towards either accepting or rejecting lean as a concept that can be applied to

the public sector. Evidence illustrates that related Lean concepts, tools and techniques have been applied to a fairly successful degree however, other writings state that the issues and context of the public sector means that the approach could only ever be 'piece meal' due to the need of service processes being able to cope with variety, uncertainty and so not being over standardised and inflexible. More time and research is needed to gain a full picture of the effect of Lean in the public sector.

- The **outcomes of Lean** have led to better understanding of the implementation process as well as intangible and tangible benefits. Many writings report on the outcomes for manufacturing companies although there have been several reports on the service and public sectors. Intangible benefits, partly related to the approach and style need for Lean implementation, include a better customer understanding, within and cross-team synergies for employees and a rise in employee motivation and morale. Tangible benefits are often focused around a reduction in time, space and cost but improved quality and dependability impacting on both efficiency and effectiveness.

- Before Lean and related concepts are introduced, an understanding of the degree of **organisational readiness** is advised by some writings on change and improvement to be necessary. It is suggested, that the organisation needs to develop and communicate clear messages about Lean in terms of its content, process and outcome. The organisation needs to realise that there will be big implications for training, developing new procedures and be prepared to identify and prioritise areas which can benefit from Lean. Benchmarking is often cited as a useful tool to help the preparation process.

- The writings related to **the prerequisites of Lean implementation** can be considered in two ways – one related to the organisation and one to the improvement activity. In terms of the organisation the implementation should ensure that; all employees are engaged so that attitudes and behaviours can change; there is top management support; there is a champion and; that open communication occurs throughout the process. In terms of the improvement activity it is suggested that the value stream is identified, the type and extent of waste within the stream mapped before new approaches and processes are implemented. A number of tools and techniques have been presented for the improvement activity, referred to as the 'Lean Toolbox', including Kaizen Blitz, Six Sigma, and Value Stream Mapping often through the use of team working.

- The **barriers to implementation and adoption** include; public sector culture; lack of clear customer focus; too many procedures; people working in silos; too many targets; lack of awareness of strategic direction; general belief that staff are overworked and underpaid; domination by stakeholders; lack of understanding of the effect of variation, systems thinking and process flow.

To summarise, the literature supports the idea that Lean Thinking can be **adapted** for use in the Public Sector, to achieve a wide variety of improvement objectives. Lean Thinking works by offering a methodology that helps **integrate processes in a customer-focused manner**, **using front-line staff to generate the analysis of what is wrong with a process and how to make improvements**. Some of the literature cautions against simple replication of existing manufacturing-based approaches in the Public Sector, suggesting that service

organisations need to move away from some aspects of the manufacturing version of Lean. Although **Continuous Improvement is an integral part of the Lean philosophy**, it should not be assumed that CI is easily sustained in organisations that attempt Lean. There are a **number of critical success factors**, not always present in organisations, **that are necessary for the sustainability** of the CI element of Lean.

Appendix 1: Associated Tools, Techniques and Approaches

A1.1 Lean Tools and Techniques

It has been indicated above that Lean is a philosophy and within that there are some fundamental principles and concepts. However, to make Lean happen it consists of a number of tools, techniques and approaches often referred to as the 'Lean toolbox'. A full outline of all the tools can be found in 'The Lean Toolbox' by John Bicheno (3). The Kaizen Blitz has been outlined but another one which is of relevance to public sector is Value Stream Mapping and so is described below.

A1.1.1 Value Stream Mapping

There are tools like Value Stream Mapping from which it is possible to understand the components of a value stream and, to identify waste to either remove or reduce it (18). The seven accepted wastes (18) are:

1. Faster than necessary pace, which inhibits quality and productivity.
2. Waiting resulting from inefficient use of time.
3. Transporting large amounts of goods can cause damage and deterioration.
4. Inappropriate processing with overly complex solutions for simple procedures.
5. Unnecessary inventory creating storage costs and hiding defects.
6. Unnecessary motion of workers bending stretching or picking up items.
7. Correcting mistakes are direct costs.

Reducing waste improves production, which results in Leaner operations and the ability to expose further waste and quality problems. The seven value stream mapping tools are:

1. Process activity mapping involving five steps. First an analysis of the process is undertaken, followed by the identification of waste. Then consideration of whether the process can be rearranged in more efficient sequence, whether there is a better flow pattern and whether superfluous tasks can be removed.
2. Supply chain response matrix seeks to portray the critical lead times for a particular process from distribution, supply to retailer. Once the total lead-time is understood, individual lead times and inventory amounts can be targeted for improvement.
3. The production variety funnel allows an understanding of how firms or supply chains operate, how complexities can be managed and the identification of similarities and differences between industries. This tool can be useful for targeting inventory reduction.
4. The quality filter map identifies the three types of quality problems that can exist in a supply chain. These are defects with the finished product as noted by customers, service defects not concerned with the production of the product and defects picked up by internal inspection systems. Each defect can be mapped along the supply chain to target improvement activity.
5. Demand amplification mapping assess how demand changes along the supply chain in varying time periods. The information can be used to redesign the value stream configuration, manage fluctuations or establish solutions to manage regular and exceptional demand.
6. Decision point analysis at the point in the supply chain where demand-pull gives way to a forecast driven push. Understanding where this point lies is useful for assessing processes upstream and downstream from this point and for designing what if scenarios to see the impact of moving the point. The may allow for a better design of the value stream.
7. Physical structure mapping is useful for understanding what a particular supply chain looks like at an industry level. This knowledge helps to understand how the industry operates and for directing attention to areas that may not be receiving sufficient development attention (18).

The Value Stream Analysis tool involves completing the sections on the wastes identified, the mapping tools available and the correlation between these tools and wastes. A high correlation is equivalent to 9 points, medium to 3 points and low to 1 point. Then identifying for each of the wastes the benchmark company in the sector (Section A), in order to get people to think about who is best at reducing waste. The next stage is to ascertain the individual importance of the seven wastes by assigning weights to them (Section B). The last stage is to create total weights for each tool in order to identify how useful each tool is in identifying the various wastes designated as most important by the organisation. This type of calculation is applied to each row so that scores are recorded for each individual correlation. The total scores for each column are then summed and recorded in Section C. The columns with the highest scores are those that contain the most appropriate tools. It is useful to choose more than one tool. Also make sure that the most important two or three wastes, are being addressed by tools with which they are highly correlated.

		Tools							
Wastes	**Weight (Section A)**	Process Activity Mapping	Supply Chain Response Matrix	Production Variety Funnel	Quality Filter Mapping	Demand Amplification	Decision Point Analysis	Physical Structure	**Competitor Analysis (Section B)**
Overproduction		Low	Medium		Low	Medium	Medium		
Waiting		High	High	Low		Medium	Medium		
Transport		High						Low	
Inappropriate Processing		High		Medium	Low		Low		
Unnecessary Inventory		Medium	High	Medium		High	Medium	Low	
Unnecessary Motion		High	Low						
Defects		Low			High				
Overall Structure		Low	Low	Medium	Low	High	Medium	High	
	Total Weight **(Section C)**								

A1.2 Related Tools and Techniques

For the purpose of this research it was decided to define Lean in a wider context i.e. good practice of process/ operations improvement that has allowed reduction of waste, improvement of flow and better concept of customer and process view. Therefore, other approaches were also considered in the literature review including business process re-engineering, six sigma and just in time in order to identify any relevant writings which may help in considering the implementation of Lean in the public sector.

A1.2.1 Business Process Re-engineering (BPR)

Business Process Re-engineering (BPR) aims to organise people, materials, energy, equipment and procedures into specific work activities. Case studies of a public sector service organisation implementing BPR focus on the practicalities of implementation and problems due to political and people issues (5). There has been a study of BPR within UK hospitals, which examines a corporate change programme from a knowledge perspective (35). In health care doctors still control major process from admittance to discharge, while management plays a facilitative role. BPR was extended to four core processes of emergency entry, patient stay, patient visit and clinical support services. This generated new knowledge about the need to adapt and customise redesign methods to suit clinical contexts and communities within the hospital. The implementation of BPR was tailored to clinical situations, which meant that it could not be implemented in a mechanised fashion. This further led to the lead being given to managers for the implementation of the BPR programme. The approach proved to be inadequate and the infrastructure for external change agents was disbanded. It was found that managers could not necessarily direct a change in a clinical domain (35).

Another study reported on a BPR attempt where the need for change arose out of low customer satisfaction due to inefficient processes clogging up the supply chain. However, the technical, financial and political restraints led to only a hybrid version of the old and new system being implemented. Although internal people were used to drive the redesign these people still had a vested interest in preserving as much of the status quo as possible and suggested modifications were conservative. The main problems associated with BPR for this project were then concluded to be (5):

- Effecting culture change when staff felt threatened by redundancy.
- Drawback of the team approach – can a specialist really do the work of a generalist.
- Power in relations between management and employees.
- Role of management consultants - different techniques branded and accusations of oversimplification as a sales pitch.

Other research has stated that the critical factors in process re-design projects are (15):

- The redesign must address 6 "depth levers" – roles and responsibilities, measurement and incentives, organisational structure, information technology, shared values and skills.
- Need to restructure all the organisational elements from layout of offices to skills required.
- Process improvement can only produce lasting results if senior executives invest their time and energy.
- Won't get level of return if the processes are too narrow and only 1 or 2 depth levellers are changed.
- Success will only happen if true cost savings have breadth and depth.

Therefore, a study of a number of companies concluded that successful redesign would only be achieved if an organisation (15):

- Set an aggressive performance target
- Commit 20-50% of CEO time to the project
- Conduct a comprehensive review of customer needs
- Assign an additional senior executive to be responsible for implementation
- Conduct a comprehensive pilot of the new design

The same study also highlighted the following ways to fail (15):

- Assign average performers
- Measure only the plan
- Settle for the status quo
- Overlook communication

A1.2.2 Just In Time (JIT)

The Just In Time (JIT) philosophy adopts a make when needed approach in order to reduce non-value added waste. The advantages of JIT are (69):

- Potential for increasing organisational efficiency and effectiveness and eliminating waste in production and material.
- Improving communication internally within the organisation and externally.
- Potential for reducing purchasing costs, a major cost to many organisations.
- Reducing lead-time, decreasing throughput time, improving production quality, increasing productivity and enhancing customer responsiveness.
- Fostering organisational discipline and managerial involvement.
- Integrating the different functional areas of the organisation.

Studies looking at the application of JIT in the administrative functions of an organisation, e.g. billing, order taking, financial tasks like accounting (4). One of the techniques used is "under capacity scheduling", whereby any employee performing an administrative task should have time to identify the problems in the task and provide a solution to improve productivity. Solutions include:

- Layout and merger of operations so that interrelated activities are close together.
- Standardisation of tasks and training of workers to increase flexibility and efficiency.
- Worker centred quality control to trace task performance to an individual.

- Finding factors that cause slowdown, by reducing workers involved in doing the tasks.
- Cellular organisation and grouping is also considered to increase ease of communication and better delivery of the task.

A1.2.3 Six Sigma

Six Sigma uses the five-step DMAlC (Define, Measure, Analysis, Improve and Control) process to identify, define, characterise and resolve tough business problems by applying a combination of statistical thinking and Lean thinking (58).

- Define Step: Management works with its Six Sigma specialists to identify the business issue and define a significant project for close scrutiny.
- Measure Step: Determines the baseline business performance for the process, identifies all potential failure modes, characterises the measurement capability within the process and also identifies both its current performance capability as well as the potential for improvement in both statistical and financial terms.
- Analysis Step: Identifies the variables that contribute the most variation to the undesirable outcome of the process.
- Improve Step: Optimises process performance by defining the set operating conditions for best performance and testing these factors to establish the degree of performance improvement that is available on a consistent basis.
- Control Step: Prepares the process for routine operation at thee new level of performance and integrates the improvements in the business control systems.

By process mapping the value stream of the process, Six Sigma specialists identify unnecessary process complexity, eliminate unnecessary work, and minimize the process activities that do not add value. Lean production tools such are integrated with the quality tools used to produce a combined "Lean sigma" perspective of process performance that identifies both the Lean improvement opportunities as well as the statistically based improvement opportunities (58).

Studies have shown that a significant number of organisations applying six sigma have not been in manufacturing, and have provided case studies in which six sigma was used to reduce student scheduling (timetabling) errors (2).

Six Sigma is being applied now to various sectors with government and healthcare applications joining manufacturing, financial, information technology and other sectors. In many instances the supporters of this approach (12):

- Believe that existing culture and systems (for example, Lean, ISO 9000 and continuous improvement) are sufficient to meet their needs.
- Do not understand Six Sigma or have the internal capability to assess its potential value to them.
- Regard the costs of hiring, training and retaining Six Sigma talent as prohibitive in view of what they believe the returns will be.
- Are in services and do not see the applicability of Six Sigma since they don't make things.
- Fear change for any of a variety of reasons, some of which may be valid.

Six Sigma supports report on high returns on investment, defect reduction or elimination, cycle time reduction, waste reduction, market share gain, significant product or process improvement or innovation, and increased customer satisfaction (12). However at the root of Six Sigma failures one commonly finds poorly scoped projects, poor project management or use of Six Sigma when another method might have proved a better match (12).

A1.3 Agile Manufacturing

Agile Manufacturing is presented not as a component of Lean but for completeness as often Lean and Agile are presented in documents and writing together i.e. ‘Lean and Agile’. However, it is important to realise that Agile is not the same as Lean as it is often considered to be appropriate for high variety, low volume situations whereas Lean lends itself to high volume and low variety. Agile can be seen as the principles of Lean combined with Flexible Manufacturing Systems (FMS) to provide low-cost manufacturing for all volumes through application of processes, techniques and people. There are comparisons with Lean through considering the elements of agile (54):

- The product; agile considers optimising current processes but has flexibility to respond to other developments whereas Lean only responds to the first.
- The process; agile focuses on the reduction or elimination of variables.
- The people; important in both.
- Global manufacturing; important for both.

Appendix 2: Approach

The articles used for this literature review have been obtained from the following sources:

- Reviewing identified journal articles, including peer-reviewed articles, which were downloaded or obtained from The University of Warwick library.
- The research team's own knowledge and collection of articles, papers and reports from other current and previous research projects. This includes articles written by authors such as James Womack, Dan Jones (plus the website of The Lean Institute), Peter Hines and Nick Rich.
- UK Government sources, including work done at the National Health Service, service delivery units and searching other central government departments such as Cabinet Office/Treasury and the Office of the Deputy Prime Minister.
- The websites of professional institutes and consultancies especially Andersen Consulting, Vanguard and Oakland Consulting.
- The work of other academic professional contacts such as colleagues at the DANSK Industries and colleagues who are members of international academic networks, including as EurOMA (European Operations Management Association).

A total of 81 sources of data were reviewed comprising articles, papers and reports. These were distributed among the team of researchers. Each researcher was responsible for reading the data and summarising the information on a Data Extraction Sheet (DES). Upon reading the data sources, it was discovered that a further nine sources were not relevant for this review. As a result, these were excluded from the list of data sources (see Annex 3).

The remaining DES were collated by the researchers preparing the literature review, and organised according to the sections listed below. Appropriate information from each DES was then taken and used to complete the relevant section. The separate DES are included in a separate Annex 3.

- Overview / History of Lean
- Lean in the Public Sector
- Lean Thinking in Practice
- Organisational Barriers
- Organisational Readiness
- Implementation Process
- Outcomes
- Associated Tools, Techniques and Approaches

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ANNEX 2 A SURVEY OF SCOTTISH PUBLIC SECTOR ORGANISATIONS

Table of Contents

A SURVEY OF SCOTTISH PUBLIC SECTOR ORGANISATIONS: EXECUTIVE SUMMARY

The aim of this report is to outline the results of a survey of Scottish public sector organisations undertaken between September and November 2005. The survey is part of a larger investigation undertaken by Warwick Business School, on behalf of the Scottish Executive, on the evaluation of the Lean approach to business management in the public sector.

The definition of Lean used for the purpose of this survey was provided in the survey questionnaire. The definition used is essentially any good practices of process / operations improvement that have resulted in a reduction of waste, improved the flow and provided a better concept of customers and process views.

The Scottish Executive distributed the questionnaire via email to all public sector organisations in Scotland. Questionnaires were completed by those implementing Lean and returned via either email or post. In summary, 24 responses to the survey were received from a variety of public sector organisations mainly located in the north, west and central areas of Scotland.

The analysis of the survey results has produced the following main conclusions:

- A significant proportion of public sector organisations are undertaking business improvement projects using Lean concepts, tools and techniques, primarily in the area of housing and finance.
- The main aims of these projects are to improve quality, improve customer satisfaction and to reduce lead-time.
- All survey respondents are developing plans to implement Lean projects in other departments or business areas.
- The main resources required by organisations when implementing projects include additional internal staff and external support in the form of consultants.
- Many organisations utilised a combination of external support, but especially customers or a specialised consultancy when implementing Lean projects.
- The main strategies used to engage staff was consultations with staff and the use of workshops and awareness raising sessions.
- A combination of methods was used for communicating progress on the Lean projects, but the main methods were meetings and intranets.
- Many of the Lean projects were reported to have been successful in achieving their original aims.
- Those Lean projects deemed to be unsuccessful in achieving their original aims were mainly concerned with cost reduction or workforce reduction.
- Managerial commitment to ongoing improvement was seen as the most important factor contributing to the success of the Lean projects.
- The most important barriers were organisational culture, a resistance to change and lack of awareness or knowledge of Lean.

1. Introduction

The aim of this report is to describe a survey of Scottish public sector organisations undertaken between September and November 2005. The survey is part of a larger investigation undertaken by Warwick Business School, on behalf of the Scottish Executive, on the evaluation of the Lean approach to business management in the public sector. Lean is defined as essentially any good practices of process / operations improvement that have resulted in a reduction in waste, improved the flow and provided a better concept of customers and process views.

Section 2 of the report describes the survey methodology and provides a breakdown of respondents to the survey in terms of geographical location and type of public sector organisation. Section 3 of the report provides a quantitative and graphical breakdown of the results of the survey, incorporating the views and opinions of the respondents, together with an analysis of the results. A qualitative analysis of the survey results is provided in section 4 of the report, with a selection of the actual comments made by the respondents in the open-ended questions of the questionnaire. Section 5 includes the conclusions drawn from the analysis of the survey results. Appendix 1 of the report includes the survey questionnaire that was sent to public sector organisations in Scotland. The questionnaire also outlines the definition of Lean that was used for the survey.

2. Methodology

The survey was undertaken by an independent research company, AtoZ Business Consultancy. The questionnaire contained 20 questions designed to obtain information on the type of Lean projects that have been implemented, how they were implemented and whether they had been successful in achieving their original aims. The questionnaire contained a mix of open-ended and closed questions. A copy of the questionnaire is attached at Appendix 1.

The Scottish Executive distributed the questionnaire via email to all public sector organisations in Scotland during September. In many instances the questionnaire was sent to the prime Scottish Executive contact in the organisation or the Chief Executive for cascading. In order to ensure that sufficient time was given to enable this to occur, organisations were given seven weeks in which to complete and return the questionnaires.

Questionnaires were completed by those who were using Lean. Completed questionnaires were returned directly to AtoZ Business Consultancy via either email or post. In summary, 24 organisations responded to the survey, broken down as follows:

- 20 fully completed questionnaires were returned.
- 2 part-completed questionnaires were returned.
- 2 email responses to the questions.

Responses were received from a range of public sector organisations. The breakdown of respondents is indicated in Chart 1 below. The largest proportion of respondents came from local authorities. The actual number of organisations responding is shown in brackets.

Chart 1. Organisations responding to the survey

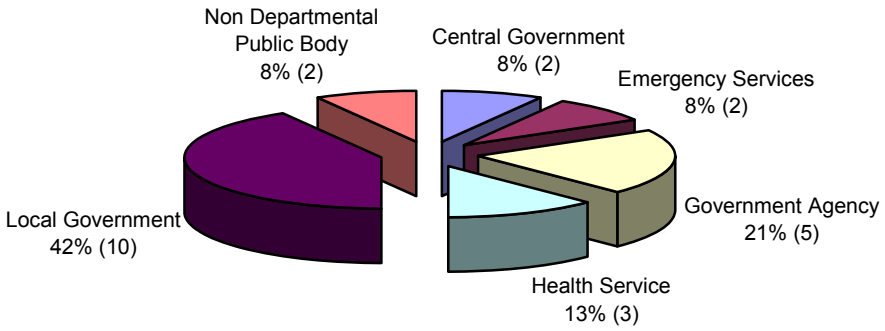
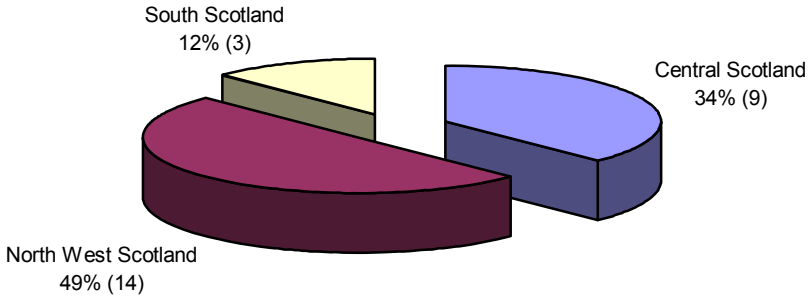


Chart 2 below show the geographical split of respondents, with the largest proportion of respondents coming from the central areas of Scotland around Glasgow and Edinburgh. However there is significant national representation with a large proportion of respondents coming from the northern areas. The actual number of organisations is shown in brackets.

Chart 2. Geographical split of respondents



3. Analysis of Results

This section analyses the information obtained from the survey, and has been presented in the order of the questions asked on the questionnaire.

1. Please list the Lean projects that you have been involved with in your organisation and provide a brief summary of them.

Comment	Number	%
One or two projects	10	44%
Between 5 and 10 projects	6	26%
About 5 projects	4	17%
Greater than 10 projects	2	9%
Only beginning to undertake projects	1	4%
Total	**24**	**100%**

It is not surprising that all respondents have undertaken Lean projects and this is a prime motivator for them to respond to the questionnaire. The largest proportion of respondents had only undertaken one or two projects. However it is noteworthy that 50% of the respondents have undertaken 5 or more Lean projects, showing either that in some organisations, individuals are taking the concept of Lean very seriously or there is a misunderstanding about what Lean is and what continuous improvement is. It could be perceived that these organisations are not seeing Lean as an overall philosophy and approach but rather as a number of stand-alone projects e.g. Kaizen Blitz or Rapid Improvement Events. This supports the research findings in Annex 3 of the evaluation. Many comments went into great detail on the projects undertaken (see Section 4).

2. Please list the departments and/or areas of your organisation in which the Lean projects have been implemented.

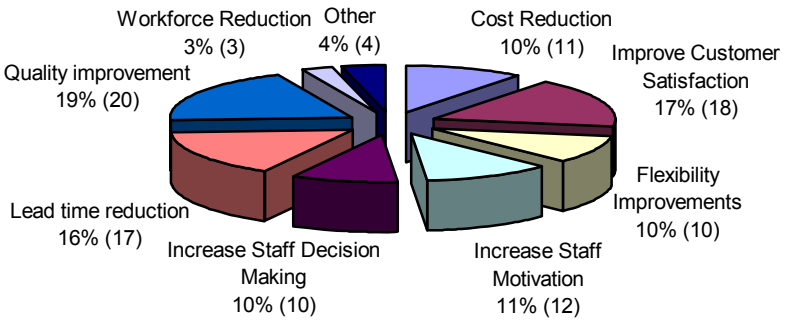
Comment	Number	%
Several departments / areas - unspecified	9	32%
Housing	5	17%
Many departments / areas - unspecified	5	17%
Finance	3	10%
Administration	3	10%
Just the one department / area - unspecified	2	7%
All departments / areas	2	7%
Total	**29**	**100%**

There was a range of comments to this question. Many respondents made references to projects undertaken in departments, but did not specifically mention the departments. The departments mentioned the most were housing, finance and administration. Several organisations have sought to implement Lean across all departments.

3. What was the original aim of the Lean projects your organisation has implemented?

This question gave respondents the option to choose any number of aims from a list of to specify their own original aim(s) for implementing Lean. The responses are presented in Chart 3.

Chart 3. The original aim of the Lean projects undertaken



Total number of responses = 105

The three main aims of the Lean projects are to improve quality, improve customer satisfaction and to reduce lead-time. These account for 52% of responses. Interestingly 21% of projects aimed to impact upon staff, either by increasing motivation or by increasing their decision making potential. Cost reduction was cited as an aim in only 10% of projects. Workforce reduction is not an important aim in Lean projects in the public sector, only accounting for 3% of projects. Other aims proposed by respondents included managing workforce duplication / reallocation, managing continuous improvement, addressing backlogs and improving the work for staff.

4. Does your organisation have any plans to implement Lean in other areas / departments?

Of the 19 respondents that answered this question, 100% said that their organisation had plans to implement Lean in other areas or departments.

5. If yes, please specify where and why.

Comment	**Number**	**%**
A few other projects planned	7	44%
Housing investment programmes planned	2	13%
Many other projects planned	2	13%
Continuous process review in finance department planned	1	6%
Projects incorporating system thinking, service delivery and customer service	1	6%
Use Lean methodology as part of toolset on all business change projects	1	6%
Plans to assist in administration department	1	6%
Projects planned in many other departments as part of e-government	1	6%
Total	**16**	**100%**

The majority of respondents are planning to implement Lean projects in a few other departments. However there was no mention of which departments these would be. Of the

specific departments mentioned housing, finance and administration were once again the areas singled out for further projects. In several organisations many projects are being planned and in one organisation, over 40 projects have been identified.

6. How long was the implementation phase of the Lean projects?

Comment	Number	%
Ongoing projects / projects always in development	6	30%
About 1 year	3	15%
Between 1 and 3 years	3	15%
Varying lengths of projects	3	15%
Between 3 and 6 months	2	10%
Very short - about 3 months	1	5%
Not yet been implemented	1	5%
3 year projects or greater	1	5%
Total	**20**	**100%**

The implementation phase of project varied greatly from 3 months to over 3 years. However in many instances the implementation of project is ongoing. This is typical and supports the idea of Lean being an approach or a philosophy.

7. What proportion of your overall organisation has been involved in implementing Lean projects?

Comment	Number	%
Between 5% and 10%	7	33%
Between 10% and 20%	3	14%
Hard to determine	3	14%
A high proportion / Everyone	3	14%
Less than 5 %	2	10%
Planning to increase the proportion of workforce involved	2	10%
Greater than 25%	1	5%
Total	**21**	**100%**

When asked about the proportion of the organisation involved in implementing Lean projects, the largest proportion of comments stated that between 5% and 10% of the organisation was involved. However approximately 57% of comments stated that less than 25% of the organisation was involved and a further 15% of comments could not determine what proportion had been involved. Only 19% of comments stated that more than 25% of the organisation was involved. Encouragingly almost 10% of comments stated that they were planning to increase involvement.

8. What have been the other resource implications of implementing the Lean projects?

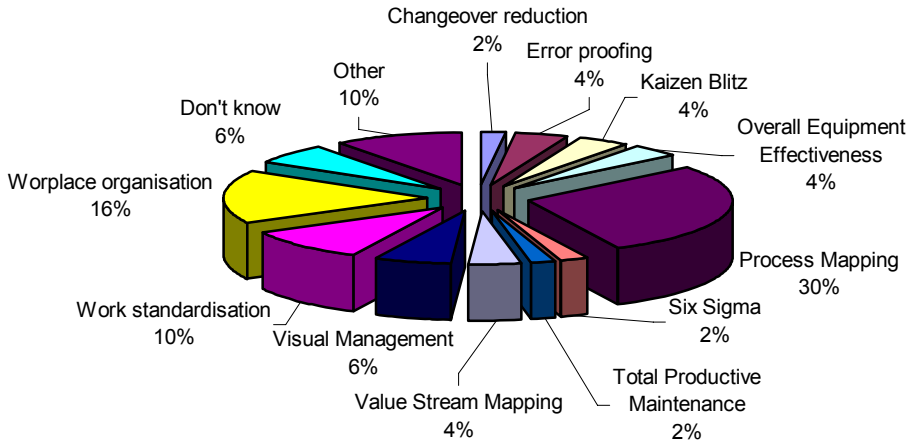
The main comments regarding other resources focus on the need for additional internal staff and time commitment, while 30% expressed the need for additional funding or additional external staff in the form of consultants. Interestingly, only 10% of comments focused on the need to invest in training or awareness.

Comment	Number	%
Additional internal staffing required	8	27%
Time commitments from all involved	7	23%
Additional funding to implement project	5	17%
External staffing required	4	13%
A need to invest in lean training or awareness	3	10%
Set up of a specialised Change team	2	7%
Additional technology resources	1	3%
Total	**30**	**100%**

9. What tools and techniques have been used in the Lean projects?

Respondents were provided with a list of tools and techniques from which they could choose to indicate their prevalence in Lean projects. There were a wide variety of answers to this question. However, it is clear from the responses provided that the main tool used in the Lean projects was process mapping. Other tools and techniques mentioned included process simplification, waste reduction, systems thinking and the use of the balanced scorecard. The actual number and percentage split for each comment is shown below.

Chart 4. Tools and techniques used in the Lean projects

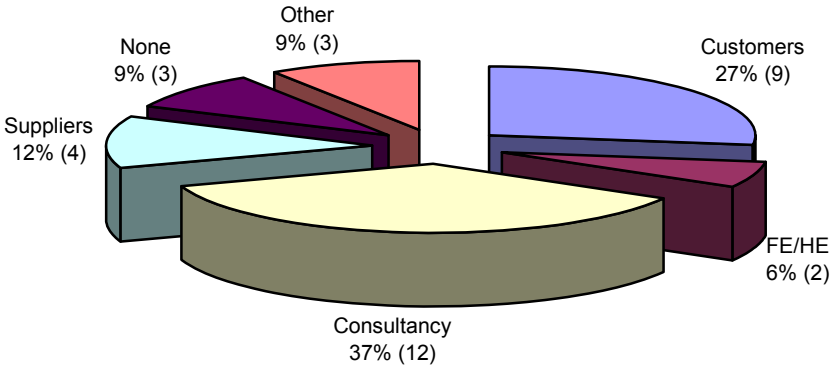


Tool and Techniques	Number	%
Process Mapping	14	30
Workplace Organisation	8	16
Other	5	10
Work Standardisation	5	10
Don't Know	3	6
Visual Management	3	6
Error Proofing	2	4
Kaizen Blitz	2	4
Overall Equipment Effectiveness	2	4
Value Stream Mapping	2	4
Changeover Reduction	1	2
Six Sigma	1	2
Total Productive Maintenance	1	2
Total	**49**	**100%**

10. What external support is your organisation utilising to assist with the implementation of the Lean projects?

Respondents were able to choose more than one option or state an alternative. The responses are presented in Chart 5.

Chart 5. External organisations providing support

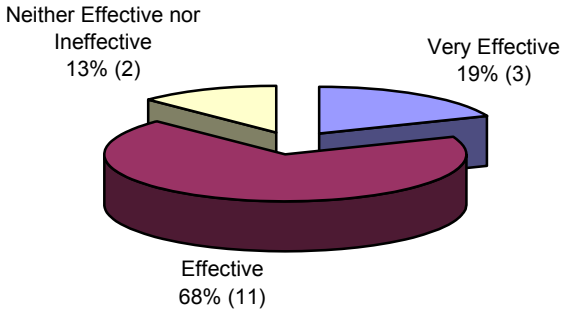


Total number of responses = 33

When asked about utilising external support in implementing Lean projects, 64% of responses stated that customers or a specialised consultancy was providing assistance. These proportions are very similar to other surveys undertaken in the manufacturing sectors where the use of customers and consultancies are often stated as the main external support. There was no mention of the specific organisation that had provided the support, however it is clear from the comments made to other questions that Vanguard had supported the Lean projects in several organisations. It is interesting to note that 9% of respondents stated that no external support had been provided. However it should also be noted that in many cases, a combination of organisations were providing support. Other types of support used include partner organisations and other private sector organisations.

11. If you have utilised external support, how effective has this support been?

Chart 6. Effectiveness of external support



Total number of responses = 16

The use of external support was seen as effective or very effective by the majority of respondents, with almost 90% of them going for one of these two options. In no circumstance was the external support seen as ineffective.

12. What strategies have been used to engage staff in the Lean projects?

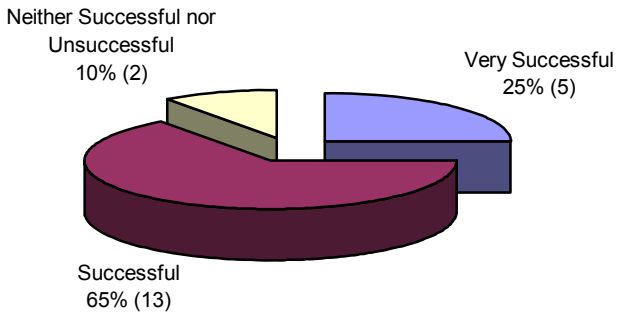
Comment	Number	%
Consultation / communication with staff	11	25%
Workshops / awareness sessions	6	13%
Meetings to discuss improvement	5	11%
Use of the system thinking methodology	4	9%
Involvement and empowerment of those concerned	4	9%
Regular reporting / inclusion in planning process	4	9%
Dedicated delegation and agreement of necessary tasks	3	7%
Training for those involved in the project	3	7%
None	2	5%
National strategies (e.g. Modernising Government and Customer First)	2	5%
Total	**44**	**100%**

In response to this question, the most common comment was a consultation or communication with staff. In many cases this was in the form of road-shows, videos or surveys. As in question 8 above, the use of structured formal training only accounted for a small proportion of comments (7%). In contrast the use of workshops and awareness raising sessions accounted for a higher proportion of comments (14%).

13. In general how successful have these strategies been?

When judging the success of strategies to engage staff, 90% of respondents believed that their strategies had been either successful or very successful. In no circumstance were any strategies viewed as unsuccessful.

Chart 7. Success of strategies to engage staff



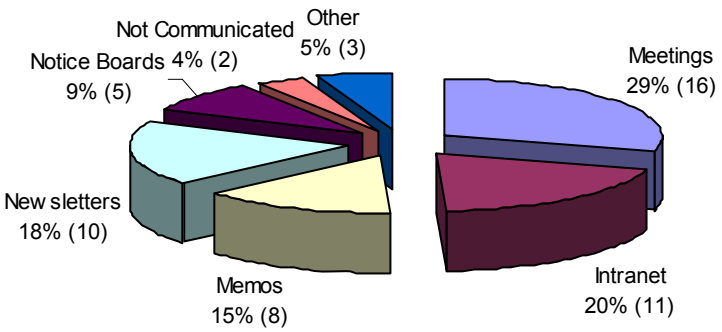
Total number of responses = 20

However with reference to the comments made in question 7, the majority of organisations involved less than a quarter of their organisation in the lean projects. It is interesting to note that on closer analysis of responses to this question and question 7, respondents claiming that strategies to engage staff were neither successful nor unsuccessful were those that had previously stated that more than a quarter of the organisation had been involved in the projects. It appears that the more people that are involved in the Lean projects, the harder it is to make a judgement about the level of their engagement.

14. How has progress on the Lean projects been communicated through the organisation?

Respondents were able to choose more than one communication option, or state an alternative. The responses are presented in Chart 8

Chart 8. Methods of communicating progress

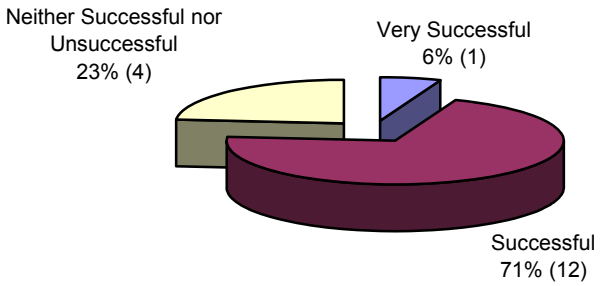


Total number of responses = 55

The main method used for communicating progress on the Lean projects was through meetings. In some cases respondents actually stated whether these were individual or group meetings. The use of intranets as a method of communicating was also high, accounting for 20% of the comments. Respondents could highlight as many methods as were relevant, with many highlighting two or three options. Only 4% of respondents highlighted that progress was not communicated. Other methods stated as being used to communicate progress included reports and working groups.

15. If progress has been communicated, how successful has this communication been?

Chart 9. Success of communication methods

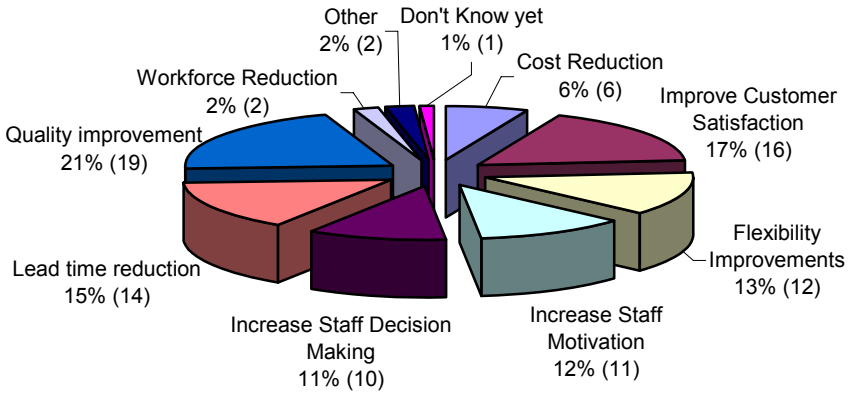


Total number of responses = 17

Although 76% of respondents believed that methods for communicating progress to staff were either successful or very successful, 24% of respondents believed that the methods used were neither successful nor unsuccessful. This is a higher proportion for this response than that highlighted by respondents in questions 11 and 13.

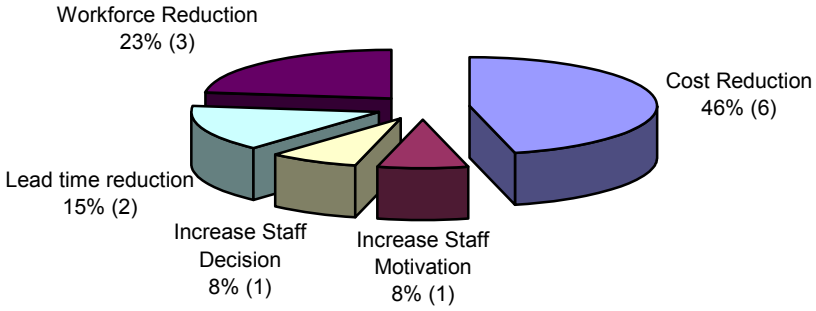
16. Which of the following proposed aims of the Lean projects have been achieved?

Chart 10. Percentage of aims achieved



Total number of responses = 93

Chart 11. Percentage of aims not achieved



Total number of responses = 13

This question asked respondents to state whether the Lean projects implemented had achieved their original aims, as specified in question 3. As highlighted in Chart 10 above, many respondents claimed that the Lean project had been successful. However there were some instances where project did not achieve their original aim, as highlighted below in Chart 11. These are mainly concerned with projects aimed at reducing costs or the workforce. As in previous questions of this type, respondents were able to choose more than one option, or state an alternative. The responses are presented in Charts 10 and 11.

17. What have been the factors contributing to the success of the Lean projects?

Comment	**Number**	**%**
Commit to ongoing improvements from management	10	21%
Committed / experienced delivery team	6	13%
Dedication of time	5	10%
Involvement and enthusiasm in all stages	5	10%
Appointing facilitator to drive the project	4	8%
Desire to improve	4	8%
Good planning	3	6%
Good communication	3	6%
Ongoing monitoring and evaluation	3	6%
Willingness to be wrong / taking risks	2	4%
Learning from experts / training of staff	2	4%
No seniority at meetings	1	2%
Realistic / focused approach	1	2%
Total	**49**	**100%**

When considering the factors that contributed to the success of he Lean projects, the most important was commitment to ongoing improvement from management. However all factors cited are those consistent with key success factors required to implement successful projects reported in the literature (Annex 1). Also important was the experience of the delivery team, although training was not considered to be as important. This supports the comments regarding training provided at questions 8 and 12 above and may indicate that

experience of implementing Lean projects is more important than undergoing formal training in lean concepts, tools and techniques.

18. What have been the barriers to implementing Lean projects and/or realising success?

Comment	Number	%
Organisational culture and resistance to change	10	28%
Lack of awareness / knowledge about Lean	5	14%
Staffing shortages / getting staff released from duties	5	14%
Lack of management commitment	3	8%
Backlogs and other ongoing work pressures	2	6%
Lack of equipment	2	6%
Short term funding	2	6%
Reliance upon or engagement with other internal departments	2	6%
None	2	6%
Inability to quantify and realise savings	1	2%
The scale of the project / high volume of data	1	2%
IT illiteracy of many people	1	2%
Total	**36**	**100%**

The most important barrier to implementing Lean projects was organisational culture and a resistance to change, accounting for almost 30% of comments. Lack of awareness or knowledge of Lean was also seen as an important barrier. However as indicated above, in order to overcome this barrier, awareness raising sessions and practical experience of Lean may be more useful than structured formal training.

19. Has there been any evaluation of the impact of the Lean projects? If so, please provide a brief summary.

Comment	Number	%
Each process improvement is monitored / audited for success	6	33%
Quantitative evaluations to measure lead time and performance indicators	4	22%
Used to produce conclusions and recommendations	3	17%
Still early days in terms of realising benefits from projects	2	11%
Used to demonstrate improvements	2	11%
Used to highlight lessons learnt	1	6%
Total	**18**	**100%**

Many comments were made regarding the evaluations that had been undertaken (see Section 4). It is important to note that evaluations are being undertaken. However in many cases, these evaluations are used to demonstrate the success of the projects rather than highlighting what lessons could be learnt from the project or how they could be implemented better in future i.e. based upon measures and outputs rather than outcomes.

20. Is there anything else that has not been covered above that you wish to tell us about Lean in your organisation?

There were not many comments to this question, nor was there much consistency between the comments. Some organisations were convinced of the benefits of implementing Lean in the public sector, while some were less sure that manufacturing techniques could be

transferred. However these comments do seem to point in the direction of it being early days in terms of determining whether Lean techniques are applicable in the public sector and that some coordination and transfer of knowledge between projects would be of greater benefit to the public sector.

Comment
Still at an early stage of development in terms of final improvement contribution
Can see the contribution that Lean tools and techniques can make
Difference between lean in manufacturing and service sector
Use of operations management can be transferred to public sector
A Lean Working Group to coordinate projects across Scottish local authorities

4. Qualitative Comments

The following are some of the actual comments made by respondents to the open ended questions on the survey. These support the comments made above and the analysis undertaken.

1. Please list the Lean projects that you have been involved with in your organisation and provide a brief summary of them.

Actual comments by respondents to this question included:
We are only just beginning Business Change projects and have not decided to take a "Lean only" approach. However we have used Lean methods (identifying failure / value demand) in a review of our Housing Repairs project. *We are using Kaizen principles and in particular facilitating Kaizen Blitz weeks to improve processes, which are critical business issues for the authority.* *[We practice] continuous improvement and have adopted a number of approaches, implementing significant process streamlining in recent years. We have not as yet used the 'lean' approach however, a number of our staff are due to attend training on how to adopt it. It is likely therefore that we will trial the methodology in the near future.*

2. Please list the departments and/or areas of your organisation in which the Lean projects have been implemented.

Actual comments by respondents to this question included:
Business improvements as a result of streamlining processes, using some elements of management, have been delivered in Corporate Services, Housing, Social Work, Finance & IT, Education and Leisure, Planning and Transport, Environmental Services. *Community Care, Housing, Mental Health, Learning disabilities.* *Pre-admission Unit, Emergency Gynaecological Triage Area and Pregnancy Assessment Service.*

5. If yes, please specify where and why.

Actual comments by respondents to this question included:
We have a further 5 projects in the pipeline and have a vision that there are multiple opportunities for this method of improving what we do. *We will use the Lean methodology as part of the toolset on all Business Change projects.* *Our techniques for improving service delivery are influenced by Lean as it is by various other methodologies. The department is not planning to specifically rollout Lean in the near future.*

6. How long was the implementation phase of the Lean projects?

Actual comments by respondents to this question included:
This varies and it is true that although our aim would be to rapidly implement outcomes this is not always feasible. *Most projects were implemented within three months.* *This has varied from as little as 3 months to certain projects such as service reviews to improve delivery channels that are still in progress. The latter involves using technologies to automate processes and eliminating waste and failure demand.*

7. What proportion of your overall organisation has been involved in implementing Lean projects?

Actual comments by respondents to this question included:
7 out of 8 departments have been subject to Business Improvement projects. *All departments have been involved in varying extents.* *So far to date very few. The plan for the future though is to increase this to involve every individual.*

8. What have been the other resource implications of implementing the Lean projects?

Actual comments by respondents to this question included:
Local Authority funding allocations create financial constraints that impinge on what can be achieved with developing and improving services. This also has a knock-on affect on having adequate staffing, training, resources and time to plan for successful developments/improvements. *Finance has not been a problem. Getting front line staff released from their normal duties to participate in group work can be problematic.* *Where possible [the organisation] used internal resources for improvement projects, unless the project has necessitated the need for specialist knowledge. The [organisation] however has used external consultancy that deployed Lean to streamline our Housing repairs process.*

12. What strategies have been used to engage staff in the Lean projects?

Actual comments by respondents to this question included:
Regular reporting of service delivery and implementation to strategic level managers/partnerships identifying issues, gaps and needs. Staff Team meetings to monitor and evaluate these and individual project management to ensure workloads have tasks prioritised appropriately to meet targets. *Agency wide, staff have been consulted both through their managers, by using a business briefings road-show to encourage business improvement and by integrating [this] into the Corporate and Local Action Planning Process which cycles annually.* *Staff have been engaged in a number of ways from initial research via surveys, focus groups etc., involvement in project teams, through to full training and development in the new process. In addition major improvement projects are always accompanied by a full communications plan, which will include newsletters, team briefing, information cascade etc.*

17. What have been the factors contributing to the success of the Lean projects?

Actual comments by respondents to this question included:
Taking it seriously. Having one person driving the project. Having total Management commitment from the top down. Learning from an expert and thereafter beginning to mould it into something else. *Careful planning and enthusiastic staff.* *Probably the major factor has been demonstrating commitment though staff training and investment to release resources to undertake projects….. Supporting this has been the role of managers in encouraging staff to act and think differently and taking "risks" in adapting the manager's role to managing the system rather than….. managing through targets and budgets.*

18. What have been the barriers to implementing Lean projects and/or realising success?

Actual comments by respondents to this question included:
A lack of understanding of which topics to pick in the early days. Less senior managers being uncomfortable with change, which they see as imposed by staff. *The 'work pressure' and 'volume of work' is ever present when trying to also look to making specific 'improvements'.* *A fundamental change in working practices.* *Culture – some managers are still very much "command and control".* *Lack of management "Buy-In"*

19. Has there been any evaluation of the impact of the Lean projects? If so, please provide a brief summary.

Actual comments by respondents to this question included:
A review in late Aug was put together to examine where we are with the Kaizen initiative and in each individual project. This was for Senior Managers and was shared with all past team leaders. It is recognised that in a large organisation like ours it is early days. *The majority of Business Process Reengineering projects undertaken are accompanied by a findings and recommendations report.* *All projects undergo full evaluation as part of the project plan. In addition, a number of have internally and externally evaluated usually through Audit.*

20. Is there anything else that has not been covered above that you wish to tell us about Lean in your organisation?

Actual comments by respondents to this question included:
We feel it is important to stress the difference between the proper application of 'lean' in the manufacturing and service sector. Processes in the service sector have a greater variety of demand and the customer is involved in production. The solution therefore is to design processes to absorb this variety and not 'standardise' as in manufacturing. *We are still at an early stage of development in terms of formal improvement methodology but can see the contribution that Lean tools and techniques can make.* *It will be useful to have a "Lean working group" that coordinates the implementation of the technique across all the Scottish Local Authorities. This will no only ensure that we are pooling all our internal resources while deploying this technique but also ensure that the benefits are widely distributed.* *I believe the use of advanced operations management methods can be transferred to the public sector and can help meet such challenges. We will continue to exploit every opportunity to improve our effectiveness and efficiency including, where appropriate the use of lean techniques.*

5. Conclusions

This survey is very useful for providing an insight into how Lean improvement projects are being undertaken in Scottish Public Sector Organisations. However, the results from the survey have to be treated with caution as the sample size used is too small to be representative of the public sector in Scotland. The statistical data generated from the survey cannot be reported with any level of significance that would make it representative of the whole population.

However the survey is useful for drawing out the following conclusions:

- A significant proportion of organisations from different public sectors in Scotland are undertaking business improvement projects using Lean concepts, tools and techniques. These projects are being undertaken in a variety of departments or business areas, but mainly in housing, finance and administration.

- The main aims of these projects are to improve quality, improve customer satisfaction and to reduce lead-time. Cost reduction and workforce reduction projects appear to be less important in the organisations surveyed.

- All survey respondents were developing plans to implement Lean projects in other departments or business areas, especially housing, finance and administration.

- The implementation phase of projects varied greatly from 3 months to over 3 years. However in many instances the implementation of project is ongoing.

- The majority of respondents involved less than a quarter of their organisation or were unsure what proportion of the organisation had been involved in the projects. However many respondents were planning to increase involvement.

- Other resources required by respondents when implementing projects included additional internal and external staff, an increased commitment of time and additional funding.

- When asked about utilising external support in implementing Lean projects, the majority of respondents stated that customers or a specialised consultancy was providing assistance. However in many cases, a combination of external organisations were used to provide. The majority of respondents saw the use of this external support as effective or very effective.

- The main strategies used to engage staff was consultations with staff and the use of workshops and awareness raising sessions. Respondents viewed the use of these strategies as successful or very successful. However there is some evidence to suggest that strategies adopted to engage a higher proportion of staff were less successful than those used to engage a lower proportion.

- The main methods used for communicating progress on the Lean projects were meetings and intranets. However in many cases, a combination of communication methods were used. Only in a small proportion of organisations was progress not communicated. The majority of respondents saw these methods for communicating progress as successful or very successful.

- Many respondents claimed that the Lean projects had been successful in achieving their original aims. It was mainly cost reduction or workforce reduction projects that were not successful in achieving their original aims. It appears that in the public sector Lean is not being used to achieve cost or workforce reduction. This is supported by the cross case analysis.

- Managerial commitment to ongoing improvement was seen as the most important factor contributing to the success of the Lean projects. The most important barriers were organisational culture, a resistance to change and lack of awareness or knowledge of Lean. Training in Lean tools and techniques was not seen to be as important as practical experience of just implementing Lean projects.

Appendix 1: Lean Questionnaire

Evaluation of the Lean Approach to Business Management and its use in the Public Sector

Survey of Scottish Public Sector Organisations
September - October 2005

This questionnaire allows you to provide your views on any Lean projects that have been or are being implemented in your organisation. The definition of Lean used for this survey is essentially any good practices of process / operations improvement that have resulted in a reduction of waste, improved the flow and provided a better concept of customers and process views.

Please include your own views in completing this questionnaire. AtoZ Business Consultancy will abide by the Market Research Society of the UK and its policy of not sharing individual views with any third party and no individual view will be able to be identified in the analysis of the questionnaire results.

Name (optional): _____

Organisation: _____

Department: _____

Position: _____

Organisation Type:

Central Government	☐	Emergency Services	☐
Government Agency	☐	Health Service	☐
Local Government	☐	NDPB	☐
Other (Please specify)	☐	_____	

1. Please list the Lean projects that you have been involved with in your organisation and provide a brief summary of them.

2. Please list the departments and/or areas of your organisation in which the Lean projects have been implemented.

3. What was the original aim of the Lean projects your organisation has implemented?
Please tick as many options as relevant.

Cost reduction	☐	Customer satisfaction improvement	☐
Flexibility improvements	☐	Increase staff motivation	☐
Increase staff contribution to decision making	☐	Lead time reduction	☐
Quality improvement	☐	Workforce reduction	☐
Other (Please specify)	☐	_____	

4. Does your organisation have any plans to implement Lean in other areas / departments?

Yes ☐ No ☐

5. If yes, please specify where and why.

6. How long was the implementation phase of the Lean projects?

7. What proportion of your overall organisation has been involved in implementing Lean projects?

8. What have been the other resource implications of implementing the Lean projects?
For example time and finance.

9. What tools and techniques have been used in the Lean projects?
Please tick as many options as relevant.

Changeover Reduction	☐	Error Proofing	☐
Kaizen Blitz	☐	Overall Equipment Effectiveness	☐
Process Mapping	☐	Six Sigma	☐
Total Productive Maintenance	☐	Value Stream Mapping	☐
Visual Management	☐	Work Standardisation	☐
Workplace Organisation	☐	Don't Know	☐
Other (Please specify)	☐	_____	

10. What external support is your organisation utilising to assist with the implementation of the Lean projects?
Please tick as many options as relevant.

Customers	☐	Further / Higher Education	☐
Local Enterprise Centre	☐	Specialist Consultancy	☐
Suppliers	☐	None	☐
Other (Please specify)	☐	_____	

11. If you have utilised external support, how effective has this support been?

Very Effective	Effective	Neither Effective nor Ineffective	Ineffective	Very Ineffective
☐	☐	☐	☐	☐

12. What strategies have been used to engage staff in the Lean projects?

13. In general how successful have these strategies been?

Very Successful	Successful	Neither Successful nor Unsuccessful	Unsuccessful	Very Unsuccessful
☐	☐	☐	☐	☐

14. How has progress on the Lean projects been communicated through the organisation?
Please tick as many options as relevant.

Individual / Team Meetings	☐	Intranet	☐
Memos	☐	Newsletters	☐
Notice Boards	☐	Progress Not Communicated	☐
Other (Please specify)	☐	_____	

15. If progress has been communicated, how successful has this communication been?

Very Successful	Successful	Neither Successful nor Unsuccessful	Unsuccessful	Very Unsuccessful
☐	☐	☐	☐	☐

16. Which of the following proposed aims of the Lean projects have been achieved?
Please ensure that these are the same aims you highlighted in Question 3.

	Achieved	
Aim	Yes	No
Cost reduction	☐	☐
Customer satisfaction improvement	☐	☐
Flexibility improvements	☐	☐
Increase staff contribution to decision making	☐	☐
Increase staff motivation	☐	☐
Lead time reduction	☐	☐
Quality improvement	☐	☐
Workforce reduction	☐	☐
Other (Please specify) _____	☐	☐

17. What have been the factors contributing to the success of the Lean projects?

18. What have been the barriers to implementing Lean projects and/or realising success?

19. Has there been any evaluation of the impact of the Lean projects? If so, please provide a brief summary.

20. Is there anything else that has not been covered above that you wish to tell us about Lean in your organisation?

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS QUESTIONNAIRE

YOUR VIEWS ARE IMPORTANT AND WILL REMAIN CONFIDENTIAL

A full analysis of the results from this questionnaire will be available in the evaluation report to the Scottish Executive. However, if you would like to receive a summary of the results of this survey, please provide your email address below. This information will be sent to you in confidence.

PLEASE RETURN THE COMPLETED FORM EITHER BY POST OR E-MAIL BY **FRIDAY 21ST OCTOBER 2005** TO:

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