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Article in *International Journal of Services and Operations Management* · July 2011

DOI: 10.1504/IJSOM.2011.041239

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A methodology for the implementation of lean thinking in manufacturing support services

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Abstract: In recent years manufacturing organisations have recognised that service superiority is a principal strategic device through which to gain competitive advantage. However, there is a shortage of tools available for creating true service superiority and more importantly a shortage of implementation guidelines. This paper sheds light on the lean thinking model applied to manufacturing support services, often operating as call centres, by proposing a novel methodology for its implementation as a value creating model. Ten in-depth interviews were conducted with manufacturing managers, a consultant and lean thinking intervention team members in a manufacturing organisation in order to synthesise an implementation methodology. The emerged methodology consists of six steps and decision making criteria that facilitates the implementation of lean thinking in manufacturing service centres. It is concluded that the methodology can be used as an initial strategic tool for senior management intervention in order to provide lean thinking leadership and to develop alternative implementation recommendations.

Keywords: manufacturing organisation; lean thinking; support services; call centres; methodology.

Reference to this paper should be made as follows: Jaaron, A. and Backhouse, C.J. (xxxx) 'A methodology for the implementation of lean thinking in manufacturing support services', *Int. J. Services and Operations Management*, Vol. X, No. Y, pp.000–000.

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1 Research context

Achieving organisational competitiveness is critical for manufacturing organisations success regardless of their type and size (Hoehn, 2003; Al-Mutairi et al., 2005; Phusavat, 2008a). Not surprisingly, manufacturing organisations view service delivery and quality as a competitive priority in this regard (Phusavat, 2008b). This is due to the belief that the wide-spread and rapid uptake of the latest technologies and their utilisation by competitors has made competition intense and continuous (Matt, 2009). In many situations an organisation's competitors, equipped with the latest technology, are able to produce physical products with almost the same high quality. This has resulted in many organisations adopting new innovative ways to distinguish themselves from their competitors and to achieve competitive success not through the products they produce, but through the services they provide (Gebauer, 2007; Gebauer, 2009). Therefore, several manufacturing firms have become more service-oriented through the development of competition strategies based on service customisation and innovation (Rajagopal, 2009; Bryson, 2010). As a result, change in service operations management has become one area where the fierce competition battle can be won (Song et al., 2009). Call centres integrated into a manufacturing organisation play a major role in this endeavour as they are the main channel of contact between the organisation and their customers (Burgers et al., 2000).

However, it is often the case that call centres' image across the service industry, including manufacturing, has been negative (Deery and Kinnie, 2004; Holman et al., 2007). Reviewing the literature on call centres reveals that this was commonly due to the method of application of technology combined with certain management practices that obstructed employee work ownership (Piercy, 2009a). This typically limited customer interaction to a relatively short conversation and resulted in dissatisfied customers (Deery et al., 2002; Pollitt, 2006). Further, customers attitudes towards this kind of industry have been negative due to the time they have to wait for service resulting in a belief that "organisations benefited from call centres more than the customer did" (Deery and Kinnie, 2004). Traditionally, call centres have been designed around the concepts of the 'machine bureaucracy' model introduced by Mintzberg (1983) and 'Taylorist' principles (Bain et al., 2002). This is usually recognised by the control imposed on employees,

narrow task definition, and operational processes that follow strict rules (Piercy, 2009b). Therefore employees are given low discretion on executing their own initiatives, and more control is placed on their own behaviour to a degree that is believed to reduce their interaction with other co-workers (Raub, 2008; Mao, 2009). However, for organisations to ensure their control on employees' behaviours and activities, 'Machine Bureaucracy' structures emphasise the necessity of rigid and formal rules and procedures (Huczynski and Buchanan, 2007). For this reason, the jobs are narrow in scope and tasks are so well defined by procedures that they standardise performance. Similarly, responsibilities of employees are clear and very-well defined by top management. However, this entails a clear top-down hierarchy of control to monitor low-level employees' performance and coordinate their reporting tasks (Mao, 2009). It is intended in these structures that uncertainty is completely eliminated and employees perform repetitive tasks under a tight 'command and control' environment (Taylor et al., 2002; Ellis and Taylor, 2006; Seddon, 2008).

In order for call centres to be a place of value addition to the manufacturing organisation in terms of competitive success, it is vital that alternative service design models be applied to them (Busi, 2005). These design models should provide a new work structure and an integration system that eliminates the flaws of command and control environments. In addition they should provide better opportunities for leveraging the call centre's contribution and strategic value for customers, employees and ultimately the organisation (Cleveland, 2006). Lean tools have proved effective to tackle the problems of 'machine bureaucracy' structures such as how to lower operating costs, improve service quality, and increase customer satisfaction (Song et al., 2009; Piercy, 2009a). However, "applications of lean to the pure-service environment, and specifically the call service centre, are unproven" (Piercy, 2009b). In the research described in this paper a systems engineering approach to the design of employee empowered customer service delivery, often described as lean thinking, is presented. This approach eliminates the characteristics of conventional call centre designs and allows for the delivery of significant, but often counter-intuitive, benefits to the parent organisation (Seddon and Brand, 2008). This implies a major shift in the role of the call centre in the manufacturing organisation and in how it is perceived by managers in other departments as by senior management (Seddon, 2008). Call centres, designed following the principles of lean thinking instil a team work approach among its employees and the values of collective problem solving (Jackson, 2008). This shift requires a mind-change for many personnel as it involves changing the way the rest of the organisation thinks about a call centres and its role in the manufacturing business (Piercy, 2009b). Typically, large number of manufacturing organisations doubts the value of such a kind of shift because of a lack of an already proven practice (Wheelwright and Hayes, 1985). Also, the benefits of operating under such models are usually invisible to senior management until sometime has elapsed and thus it is not immediately apparent as to the improved competitive position of the call centre and its internal value (Seddon, 2007). This explains why only a minority of manufacturing organisations develop such an effective structures to their call centres.

This research is an attempt to address the need for a methodology to implement new models of service designs in call centres embraced by manufacturing organisations. It introduces a practical, step-by-step, and straight forward methodology for implementing the lean thinking service design. It facilitates the identification of evidence of

improvement in the early stages of the transition, aids the synthesis of ideas by senior management, and offers the intervention team guidance on various options available during transition.

2 An overview of the lean thinking model

Lean thinking origins lie in the lean manufacturing approach typified by the Toyota Production System (TPS) as a comprehensive strategy for the elimination of waste from work operations (Ohno, 1988). Lean manufacturing is one of the most widely used techniques in the automotive manufacturing industry (Schonberger, 2007). The elimination of waste is achieved through the creation of value stream mapping of operations that deliver solutions and products in minimal time (Busi, 2005; Christopher, 2000). Rother (1998), during his work at Toyota, introduced the concept of value stream mapping as he noticed senior managers drawing maps showing the current physical flow of products as well as the information flow accompanying the physical flow. He found that these maps were the lens through which waste can be identified, and eventually eliminated, in the process to create a cleaner stream of working for each product. Lean systems have recently witnessed acceptance from service industries as a possible strategy to face increasing customer expectations and intensive economical pressures for reduced costs (Jackson, 2009). However, this acceptance did not overlook the fact that the nature of service operations differ from their manufacturing counterparts. Introducing a service does not involve making a physical product as in the case of manufacturing, even if the customer is given a product during a service, that product is prepared beforehand (Bryson, 2010). Service is more about bringing intangible things together in order to satisfy a customer demand or need through an interface (Seddon and Brand, 2008; Teboul, 1988). Further, services usually involve a much wider variety of unpredictable customer demands (Seddon and Brand, 2008). Due to this different methods are needed to solve different problems. Service agents are, thus, critical element in this process of problems solving and their intelligence and innovation is of significant importance to improve the service and reduce costs. Wei (2006) argued that a new form of 'lean' principles is required to tackle the nature of service processes and environment. However, Kim et al. (2009) found that a service department to have a successful lean project requires expert guidance and a charismatic leadership represented by project champions and senior management support, in addition to full engagement of front-line workers in the process of investigating and understanding the current system problems, finding the hidden waste in it, and in designing the service operations of the future. In the same vein, Joosten et al. (2009) found that most of the lean manufacturing implementation effort made in service departments is focused on gaining operational efficiency while much less significance is given to the socio-technical integrity effects on the successfulness of the lean implementation. Therefore, in response to the need for new innovative approaches to transfer the lean manufacturing approach to service departments, while considering the so called the need for shift in their production-line paradigm (Bowen and Youngdahl, 1998), lean thinking for service departments was developed (Seddon, 2003).

Radnor (2008) pointed out that there are some challenges which need to be addressed in order for lean thinking implementation in public services be successful. First, persuading the individuals to join the lean journey is very difficult as lean implementation would need individuals to change their job locus. Second, there is a need

to differentiate between the processes that can be changed with lean principles and those which cannot. Third, there is a need to sustain a culture where the lean principles are accepted as a part of the new work environment after the implementation phase. This debate came after an article by Seddon and Brand (2008) in which they have emphasised that the use of Taiichi Ohno's innovation in TPS (Ohno, 1988) can bring in a lot of improvement to service processes. However, they argued that such improvements are automatically achieved in the service departments once managers learn not to follow preset individual targets and service levels, as individual performance is governed by the system and not by managerial numbers.

Manufacturing organisations today can easily capture significant information as a result of customer demands addressed to the call centre (Boersma et al., 2004; Boersma et al., 2005). If this demand spectrum is studied and analysed thoroughly, and then transformed to the other business units, it can provide significant 'business intelligence' to the organisation to improve and redesign the way they do the work (Cleveland, 2007; Stockford, 2007). This helps other departments to evaluate their designs, processes, quality measures and enhance their research and development initiatives. The net result is to optimise operational processes and leverage the call centre's strategic value across the manufacturing organisation. Lean thinking is a service operations model that can help call centres analyse customer demand (Jackson, 2008) to achieve the benefits presented above. Call centre transformation on the basis of lean thinking service design requires five different stages developed by Seddon (2003, 2008), these stages are presented below:

Stage 1 Check: at this stage customer demand is analysed over a period of time to identify the main demands coming into the call centre. This allows the call centre to find out what customers expect from the service and what matters to them most (Seddon, 2003). Demand is analysed on the basis of value and failure demand. Value demand is what the call centre has been established to serve and what the customers identify as of value to them. Failure demand (i.e., non-value demand) is the demand that the call centre was not able to serve due to the lack of information or supporting operations (Seddon and Brand, 2008). The demand analysis strategy forms the basis for increasing the service capacity by identifying the reasons that hampered customer demand fulfilment in some demand areas. However, the need to satisfy customer demands and reduce the frequency of demand failure requires the elimination of waste in the service systems and the redesign of service operations to absorb variety. This will reduce resource consumption and improve capacity (Seddon, 2005).

Stage 2 Redesign: this stage involves redesigning the processes flow taking into account what has been learnt in relation to the customer 'wants' and then mapping out the new service system design. Process flow diagrams are created for every service operation; all processes classified as waste are marked in red on the process flow diagram. Processes that add value from a customer's point of view are marked in green. The minimisation of waste in service operations requires the redesign of service operations flow in such a way that the non-value adding activities are minimised in order to deliver solutions in minimal time (Busi, 2005; Christopher, 2000). However, this can only be done by designing operations from the customer point of view.

Stage 3 Experiment: the new service design is used in an experimental environment with the aim of testing, re-designing and re-testing new processes to make sure that customers get the best possible service before going live in the call centre. It is anticipated that new service operations significantly reduce service delivery delay and bring productivity improvement in the processing of customer demands and enquiries.

Stage 4 Roll-in: a gradual rolling in of employees to the new way of working is progressed at this stage. It is key at this stage to continue the identification of appropriate training needs of employees. This training includes learning about lean thinking, putting it into practice and understanding and using the new ways of working as designed at Stage 2.

Stage 5 Continuous improvement: this stage is embedded into the fully operational environment and involves making smaller changes to the way of working to improve the service offered. It also involves the identification of new demands coming in to the call centre and designing new processes that ensure new demands are treated as value demands.

The advent of lean thinking to call centres requires that managers change the way they think about their systems. Instead of exerting control on employees to follow work standards and monitoring their performance, it is required that attention focuses on the design and management of the systems itself (Seddon, 2003). This is because more than 95% of performance variations are in the system, and only 5% or less are in the employees (Deming, 1993). However, in order to enable working on the 95% of system variation employees need to be actively involved in this process. Lean thinking requires the decision-making processes to be at the employee's level to make sure that the waste is avoided and that employees are able to deliver the service with minimal consumption of resources (Seddon, 2005). Therefore, lean thinking is considered as the service delivery design with maximum economy; it gives customers only what they want in minimal time of interaction (Seddon and Brand, 2008). In this approach employees are given freedom to act and their roles change so does their job experience. Employees working in a lean thinking department enjoy a wide range of job tasks that enable them to enhance their interaction with customers (Seddon, 2005). Collective team work and responsibility sharing is of great importance in order to identify the right person or persons to solve a demand problem at minimal time.

3 Contributions of lean thinking to organisations

The consequences of this approach to service delivery design is the achievement of an organically structured business unit better able to accommodate diversity in demands of unpredictable nature than typical mechanistic structures (Huczynski and Buchanan, 2007). Mechanistic structures are typically found in those operating units that are effectively shielded from the outside environment (e.g., production, quality assurance, accounting, etc.) (Jaaron and Backhouse, 2009). However, where an operating unit experiences unpredictable demands with high levels of uncertainty of inputs then an organic structure provides optimum performance potential (Robey and Sales, 1994; McKenna, 2006). Such a structure implicitly requires that employees are given the

freedom to act and ownership of their decisions to be able to absorb customer's variable and specific requirements (Gregory, 2007). Employees operate as a team that shares the work responsibility (Suarez-Barraza, 2010); an employee can seek support from a more skilled colleague to solve a customer problem while on phone, and they enjoy variety of demand handling with open informal channels of communication between themselves as well as with other departments (Alas, 2008; Piercy, 2009a). Obviously, lean thinking, this way, is a system for respect for human resources, it meets employees needs and desires, and fulfils their expectations of employer fair treatment and the use of personal skills and innovation (Wan, 2008). Therefore, employees working in this environment have a feeling of belonging and ownership of the workplace that allow them to provide a high quality service at relatively shorter time. On the basis of the findings of Hackman and Oldham (1976) on the motivation and management of employees through the design of the work, call centre managers find no need to monitor or force the employees to do well. This assumption is emanating from the fact that lean thinking provides a work design with a satisfying and rewarding job environment where the general moral system of the workplace will guide the human resources actions (Murray et al., 2004). In addition, Gregory (2007) regarded the involvement of employees in the decision making processes offered by lean thinking as an attracting element of employees to their organisations as this reflects employees own values and builds mutual trust.

However, several examples of manufacturing organisations implementing lean thinking to non-production areas of the business have been noted in the literature (Piercy, 2009b). For example, Boeing adopted lean thinking into various administrative offices in order to improve production support activities (Black, 2009). Vinas (2004) reports that Kato Engineering has also employed lean thinking principles to expedite sales-order processing and customers' problem solving. The gradual acceptance of lean thinking into service areas of various organisations is fuelled by the fact that it provides service directors and middle managers with clarity on the system due to the continuous demand analysis performed (Suarez-Barraza, 2010), this helps managers to identify potential problems in the services offered and thus the immediate corrective measures to be taken (Seddon, 2007; Uz Kurt, 2010). In addition, system clarity and continuous improvement allows managers to focus on the main purpose of the support services (i.e., supporting customers) rather than maintaining the system against failures or achieving the service targets (Jaaron and Backhouse, 2009). Lean thinking eliminates the waste in operations that helps managers to achieve automatic productivity and performance improvements (Jain and Lyons, 2009; Gebauer et al., 2009), customers do not need to call again which allows employees to handle more demands in an efficient way without cut in service, and eventually reduce resources consumption and overall costs (Piercy, 2009a). Jackson (2008) found that lean thinking makes it possible for management to identify the opportunities for making cost savings and performance improvements in the short and medium term, both from a corporate and service perspective. The waste elimination element of the system is a resources saving activity that is seen as a major cause for capacity reduction (Seddon and Brand, 2008). Table 1 presents the main features of the lean thinking approach and compares them with the traditional managerial thinking.

To advance knowledge on how to transform manufacturing call centres to follow the aforementioned lean thinking principles a novel methodology that facilitates its implementation is presented in this paper.

Table 1 Traditional management thinking vs. lean thinking

<i>Comparative dimension</i>	<i>Traditional management</i>	<i>Lean thinking</i>
Perspective	Top-down	Outside-in
Design	Functional specialisation	Demand value flow
Decision making	Separated from work	Integrated with work
Measures	Budget, targets, output, standards	Related to purpose, variation and capability
Motivation	Extrinsic	Intrinsic
Management ethic	Manage budget and people	Act on the system
Attitude to customers	Contractual	What matters

Source: adapted from Seddon and Brand (2008)

4 Research methodology

The focus of the research is one of the market leaders in the manufacture of roof windows in the UK. This manufacturing organisation was a part of an earlier study carried out by the authors of this present paper to understand the effects of implementing the lean thinking service model in delivering significant added value to the overall manufacturing organisation. The study revealed that the development of a lean thinking type of organisation which, through significantly enhancing employee affective commitment, resulted in the twin benefits of enhanced manufacturing services and reduced overall cost (Jaaron and Backhouse, 2009). The organisation provides a complete range of roof windows, blinds and electronic accessories to its customers. The operations department of this organisation is the largest, in terms of number of employees, as it embraces the organisation's call centre and employs 108 employees. It is the call centre where the lean thinking design was implemented.

The earlier research in this manufacturing organisation ensured easy access to the organisation and rapid identification of the people involved in lean thinking implementation process. In this research, in-depth interviews were conducted with subjects who had experienced a recent lean thinking implementation project and who had actively participated in the implementation process at a manufacturing organisation. The interviews were of the 'one-to-one' type in which only one participant was interviewed at a time and they were given enough time to provide detailed explanations for their personal roles and experiences in the project. Although this approach of interviewing was time consuming (Tashakkori and Teddlie, 1998), it was chosen due to the availability of professional participants who were not reluctant to speak about their experiences and akin to free-ranging conversation (Easterby-Smith et al., 2002; Creswell, 2004). The operations manager provided entrance to the site, helped in locating people and assisted in the interviews setting. He also pointed out the importance of interviewing their project consultant and himself as sources of information that would help to understanding the lean thinking implementation process.

In total, ten in-depth interviews were conducted at which point no significantly new information was achievable from extra interviews. This was in line with McCracken (1988) who found that in order to produce perceptive themes from in-depth interviews eight interviewees are needed but subsequent to that number the returns became minimal

for the effort required. Interviewees included the company director, operations department manager, external lean thinking consultant whilst the remainder were operations department personnel who were a part of the lean thinking intervention team and experienced in the call centre operations. Table 2 presents the demographics of interviewees.

Table 2 Demographics of interviewees

<i>Identifier</i>	<i>Job role</i>	<i>Project role</i>
1	Company director	Project champion
2	Operations manager	Project champion
3	External consultant	Project consultant
4	Operational personnel	Intervention team
5	Operational personnel	Intervention team
6	Operational personnel	Intervention team
7	Operational personnel	Intervention team
8	Operational personnel	Intervention team
9	Operational personnel	Intervention team
10	Operational personnel	Intervention team

In-depth interviews were found to be of particular appropriateness for this research project as the interviews were to be conducted with professional people concerning their job related issues and experiences. A precise step-by-step understanding of their personal behaviour and decision making patterns in those experiences was required (Tull and Hawkins, 1993). A simple guiding protocol was used as a backup to help in following major concepts in the conversations about lean thinking implementation process. Also, a high level of freedom to develop questions that became relevant at the time of interview was used. The questions used were of an open-ended nature to allow detailed probing of the implementation process (Creswell, 2004; Yin, 2009). Every interviewee was asked whether he/she was comfortable with the use of audio tape to record the interview in order to remove the sense of anxiety and discomfort. Recording interviews was very helpful in supporting the researcher producing accurate transcripts and allowed for re-listening of interviews to ensure unbiased note taking (Easterby-Smith et al., 2002). A confirmation of information confidentiality and that the collected data would only be used for research purposes was provided.

After transcribing the interviews, the ‘thematic analysis’ approach (Taylor and Bogdan, 1984; Attride-Stirling, 2001) was used to analyse the data. The full process of analysis followed in this research is illustrated in the following three stages:

- 1 As a first step, the research objective and interviewees stories are studied in order to shed the light on general leading theoretical topics available. These theoretical topics, also called coding schemes (Minichiello et al., 1990), were then used to list a set of words or topics that represent a general meaning of what has been said in the interviews, this is known as the coding framework of interviews analysis (Attride-Stirling, 2001). To illustrate this approach for the current situation the research objective was identified as being “how to implement lean thinking in call centres embraced by manufacturing organisations?”. The codes used were the

problems found, project needs, choice, options, strategy and action applied. The benefit of creating such a coding framework is the generation of a list of words which can be linked into common categories during analysis (Minichiello et al., 1990).

- 2 The second step involved reading again through the transcripts of interviews and coding the content. The interviews transcripts were divided into meaningful fragments to facilitate dealing with the data. Every fragment or text segment was then given a word or a code that represent the meaning perceived and belongs to the pre-defined coding framework.
- 3 The final step involved revising the divided transcripts to find codes with common basic themes. This was done by careful reading of the coded fragments, which enabled the identification of underlying structures. This has allowed for clustering basic themes around more central themes that was used later for interpretations.

Table 3 Summary of identified codes, basic themes and central themes

<i>Codes</i>	<i>Issues discussed</i>	<i>Basic themes</i>	<i>Central themes</i>
<ul style="list-style-type: none"> • problems found • project needs 	<ul style="list-style-type: none"> • customer complaints • turnover and stress • frustration of employees • managers role • project sponsor • team members availability • team members training • rate of lost calls • problem is in the system 	<ul style="list-style-type: none"> • justifying lean thinking • leadership availability • team formulation 	<i>Lean thinking introduction</i>
<ul style="list-style-type: none"> • spread the word • attraction • curiosity 	<ul style="list-style-type: none"> • value and failure demand • communication at all level • system waste • using process flow diagrams in redesign phase • improvements identification importance 	<ul style="list-style-type: none"> • role of demand analysis • redesign phase role • improvement evidence achievement 	<i>Capacity building</i>
<ul style="list-style-type: none"> • desire • perception • good • bad 	<ul style="list-style-type: none"> • senior management don't agree on lean thinking • initial evidence was not able to convince senior management • lean thinking is seen as a threat • senior management rely on statistics • managers wants to keep the role of controller • decision making is seen senior management property 	<ul style="list-style-type: none"> • senior management way of thinking • system thinking image 	<i>Senior management reactions</i>

Table 3 Summary of identified codes, basic themes and central themes (continued)

<i>Codes</i>	<i>Issues discussed</i>	<i>Basic themes</i>	<i>Central themes</i>
<ul style="list-style-type: none"> • choice • options 	<ul style="list-style-type: none"> • savings through process mapping • information from process mapping • financial measures necessity • financial person availability • senior management visits to workplace • senior management need to touch and feel reality • power of demand analysis 	<ul style="list-style-type: none"> • process mapping role • management involvement role • management accountant role 	<i>Confronting senior management reactions</i>
<ul style="list-style-type: none"> • strategy • action applied 	<ul style="list-style-type: none"> • regular communication about improvements • more knowledge sharing about lean thinking • migration from old system • other areas transformation • new demand identification • new demand process mapping generation 	<ul style="list-style-type: none"> • new evidence and real examples role • roll in of employees • continuous improvement 	<i>Lean thinking 'beyond confrontation'</i>

5 Findings

The results from the in-depth interviews were classified into five themes. Table 3 provides a summary of all used codes, basic themes found and the five central themes identified. It was clear from the in-depth interviews that the lean thinking is a continuous project due to the continuous improvement virtue this model provides to the work place. Further, it was viewed as a new way of thinking in the call centre that needed a lot of efforts to instil in the rest of the manufacturing organisation. It is because of this reason that an implementation methodology was needed to convince senior management that this is the way forward for their business. The five themes emerged from the in-depth interviews are presented below:

5.1 Theme 1: lean thinking introduction

This theme is aimed at identifying the foundations for the lean thinking project introduction to the manufacturing organisation as a re-design tool for the call centre service operations. The prevalent feeling was that a strong need for certain foundations to be in place in order for the lean thinking implementation to be initiated. Three main foundations emerged from the in-depth interviews that are discussed below.

5.1.1 Leadership/project champions availability

It was recognised by interviewees that it is a must to have committed and effective leadership that could motivate and create enthusiasm among colleagues in order to foster support to the lean thinking concept prior to implementation. The responsibility of this leadership, also called project champion, is to play the role of 'a new way of thinking' sponsor. They must be prepared to address the reasons that necessitate migration from the mechanistic systems design. They also need to communicate what is lean thinking, what is it like to implement it, and what are the expected results at all levels. This foundation was viewed by interviewees as the corner stone for the implementation process success. The leadership must be at a high level of competence in terms of their ability to raise moral and motivation of colleagues to support the project.

5.1.2 Lean thinking justification

As a part of the effective leadership role, the initial reasons to redesign the service system according to lean thinking principles must be clearly introduced. There was a strong feeling among interviewees that employees come to work to do a good job and that any constraints on performance lies in the system previously used and not in the people. The interviewees identified the following reasons as central to justify lean thinking to employees and senior management:

- customer complaints of being passed from 'pillar to post'
- high percentage of customer demands not being met
- turnover, stress and frustration of employees
- employee voice is not heard (they must be involved in the service system design as they are the most knowledgeable about what customers want and how to serve them)
- high rate of repeated calls
- people did everything they were instructed to do but still no improvement was achieved in the service
- lack of communication channels between departments that hampered information sharing and thus service quality.

Clarification of these issues was regarded by interviewees as a major step towards creating curiosity among senior management. These issues were highlighted via a normative scoping exercise in which senior management and other colleagues were confronted with evidence that challenged their perceptions about organisational performance.

5.1.3 Intervention team formulation

The intervention team formation was seen by interviewees as a primary requirement of the leadership efforts to communicate lean thinking justifications. The intervention team members were selected from those who had high levels of operational problems and work-related stress and from those who have shown high likelihood of turnover and absenteeism. This was based on the belief that people with high levels of work-related

stress and problems are the most knowledgeable about the systems pitfalls, and will tend to accept improvement initiatives targeted at solving their own work problems. The nominated members were invited to a workshop explaining to them the vision of lean thinking and the benefits of having it in place both at personal and business levels. This was followed by a training course for those who had agreed to take part in the implementation process. It was indicated by interviewees that the majority of the invited employees accepted to take part in the implementation process. The team formation allowed the next stage of the lean thinking introduction process to be initiated (i.e., the demand analysis).

5.2 Theme 2: capacity building

With the intervention team equipped with the right level of information about lean thinking service design and the way to implement it, an analysis for the demand coming in to the call centre was carried out. Demand analysis and the identification of service system waste was regarded by interviewees as one of the most powerful tools used in the communication process in order to build capacity for the lean thinking implementation. Participants agreed that demand analysis aimed at collating information about what customers expect and want from the manufacturing organisation and what matters to them most was of prime importance. Data collated in this process enabled identification of the major demands coming into the call centre. Further, actions not adding any value from the customer's perspective and the percentage of failure calls (i.e., percentage of not met demands) were identified for the main demands coming in. These actions were viewed as the waste present in the system that must be eliminated in order to improve service performance and increase value productivity.

Demand analysis formed the basis for the plan phase to be initiated. The plan phase involved redesigning the processes flow diagrams taking what had been learned in the demand analysis and considering the customer 'wants' and then mapping out the new service processes. This was followed by experimenting with redesign of processes in order to achieve evidence of improvement through focusing on minimising non-value adding activities from a customer point of view.

Interviewees stated that evidence of improvement was primarily used to build capacity for the project. Capacity building is from within front-line employees, other department managers and the senior management in the organisation. For this purpose, communication at all levels and with other departments in the organisation was emphasised by interviewees. The messages used were centred about the lean thinking offerings and the current system problems found in the demand analysis. It was also emphasised that the correct terminology should be used (i.e., tailoring the message) according to the receiver so that a common language can be initiated to build curiosity and possibly securing support for the project.

5.3 Theme 3: senior management reaction

The third theme is centred on the consideration of senior management not directly involved in the lean thinking project. The motivation for such a theme is that whilst certain senior managers of the business were directly involved as champions of the project other senior management were not immediately involved from the earliest stages.

Whilst in an ideal situation all stakeholders should be involved from the beginning of a project this is, in reality, often impractical due to competing demands for resource. Thus it was recognised that in addition to convincing operative level employees of the benefits of the intervention there was also a significant need to convince those senior managers, not directly involved in the project, through a demonstration of results. It was only through this mechanism that the lean thinking approach could be widely adopted and thus maximise its true potential.

Two groups of senior managers were considered in this theme, one being head office managers who were interested in unit performance but had little input into operational management issues, the second being managers of units within the manufacturing business which interacted with the service section under consideration. Understanding the senior management perceptions and reactions is of great significance to find out the best ways of convincing them of the benefits of lean thinking. Interviewees were asked about the senior management reactions to the lean thinking initiative and how they would characterise the senior management reactions to it. When lean thinking was first introduced in the call centre, head office senior management and other departmental managers were somewhat unsure as to its benefits. Interviewees revealed that this scepticism was due to the belief among managers that lean thinking is a source of threat for the control they have on work. This perspective was inherited from the idea that where front line employees are given decision making authority when interacting with customers then the managers role will change and they will lose authority and control.

A second issue is the difficulty in quantifying the impact of lean thinking, this contributed to certain managers lack of support for the project. Typically management rely on statistics and numbers to evaluate success in the work place. Interviewees indicated that they felt certain managers saw lean thinking as limited to being yet another service initiative and did not recognise that it was a new way of thinking that encompasses conducting the work quite differently.

5.4 Theme 4: widening senior management involvement

Almost all the interviewees in this study have discussed the techniques that must be used in order to engender greater support from those senior management not directly involved in the project.

5.4.1 Process mapping

Of particular importance here is the process mapping of the current processes used in the call centre and the identification of the amount of waste present on them. It was emphasised that information derived from process mapping could show a strong evidence of savings and impact on work when compared with the redesigned process mappings. For example, one of the interviewees noted that the credit control manager in the organisation was convinced by the benefits of lean thinking as a result of the potential savings shown on process mapping of the visa card payments. Customer payments through credit cards had an impact on the business and it was costly due to the service charges. As a result of the demand analysis process it was found that the number of customers paying through their visa cards is of a tiny percentage (less than 1%), and that most of the payments were arranged through cheques payable to the company or through their debit cards made on phone. The process mapping was used to show each step in the

visa payment process, what problems arise at each step, how often it happens, and what is the impact of these problems on the business aspects. It was in the impact column that it was possible to identify the waste and the impact of the process how it was. This column included aspects such as frustrated customers, time delay, company brand, the potential for error (i.e., charging the wrong amount), and legal obligations. This process flow had over 50 steps in it just to take a card payment, the real saving being if the process was changed by ceasing to accept the visa card payment. It meant reduced time for the team to work on this and ultimately no charge for the hire of the machine that is needed to enable processing of payments. To accompany this, a demand analysis was also carried out over a month of all credit card payments. This showed that out of all payments a very small amount was with credit card. Therefore, making the case stronger that why should so much time and money should be invested in a process that was very rarely required? This typical example is one of many that were used to convince managers of the benefits of implementing lean thinking in place.

5.4.2 Management involvement

The majority of interviewees insisted that if the process mapping tool did not fully create buy-in from those senior managers outside the intervention, then the alternative option available was to involve them in the work itself. This could be done by inviting them to come to the work place to see things on reality by listening to phone calls and viewing the demand analysis and process mapping activities. The deliverables of the process mapping of value and failure actions from the customer perspective and the waste present in the service operations have been viewed by interviewees as very logical and very convincing if the management is involved in the process of creating them.

5.4.3 Management accountant

Interviewees highlighted the importance of the availability of quantitative measures of success to ensure a positive senior management reaction to lean thinking. Having a management accountant from the first day of the project who could show measures of success in a quantitative manner has been considered as vital by interviewees and that they should have done to facilitate communication with senior management. Quantifying the benefits of lean thinking, such as reduction in waste, reductions in lost calls, absence drops, customer retention, and employees moral and retention are used by the intervention team to convince senior management. This is emphasised due to the importance the senior management grant to savings and financial aspects related to any improvement initiative.

5.5 Theme 5: lean thinking 'implementation'

It is evident that the intervention team's attempts to obtain total senior management support took time and with various levels of success. Implementation, which was therefore primarily involved in introducing the new way working but also included an ongoing element of promotion of the benefits. Interviewees were asked what they would do to further convince those senior managers who had yet to be presented with convincing data as to potential benefits. The method most frequently used by interviewees was to maintain the ongoing set of information regarding the

implementation combined with real examples of success as they developed. Interviewees stated that lean thinking is very logical from their own perspective but recognised that the issue for senior management was not so straightforward and the logic required significant support from identifiable and tangible benefits. Once this process had been completed then implementation of the new model within the rest of the call centre by a gradual rolling in of employees was completed. It was key at this stage to continue the identification of appropriate training and better ways of working to improve the service offered in the form of continuous improvement. Continuous improvement stage was embedded into the fully operational environment and involved the identification of new demands coming in to the call centre and designing new processes that ensure dealing with new demands as value demands.

In summary, the emerged themes presented above have identified a methodology for the creation and implementation of a lean thinking service model into call centres embraced by manufacturing organisations. The data would suggest that the techniques identified from the interviews are an important mediator between the people-process factors and the successful lean thinking implementation as shown in Figure 1.

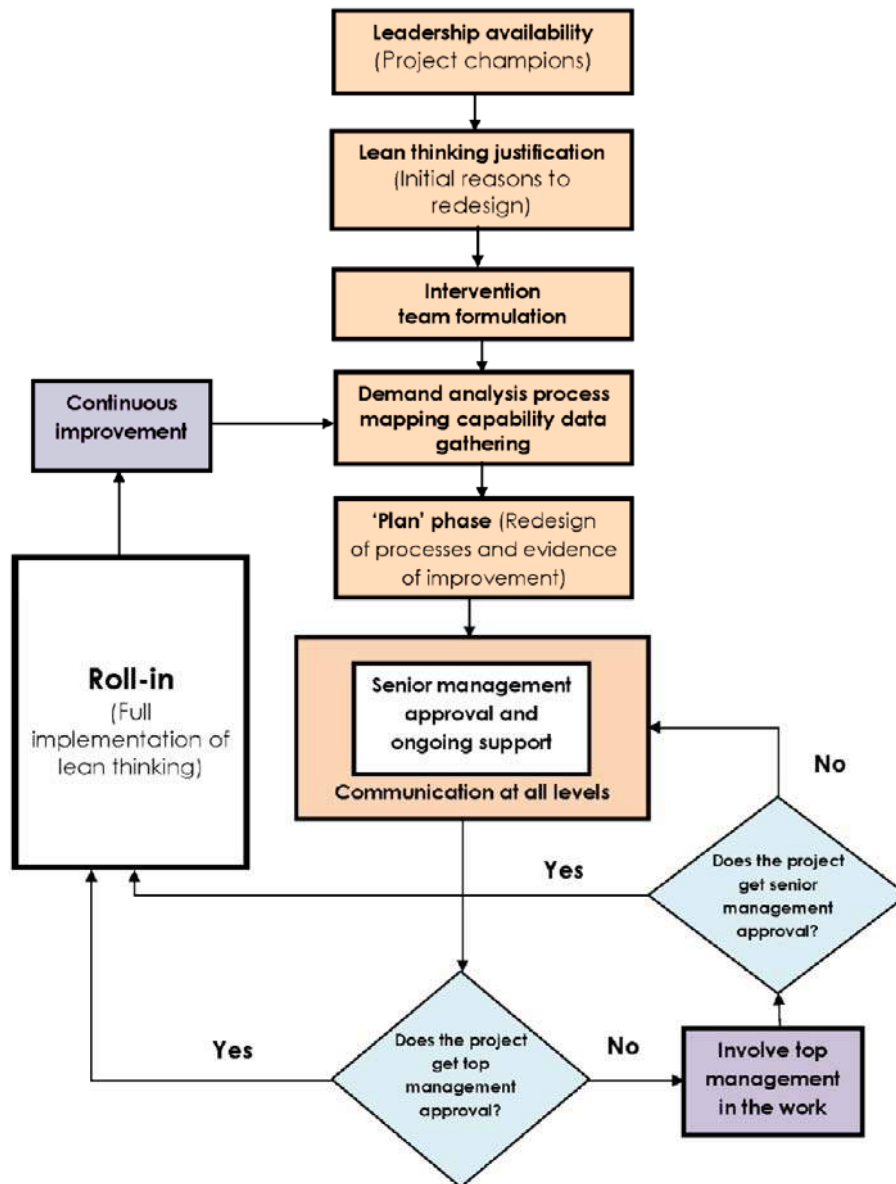
6 Discussion and implication

The findings of this research present a methodology to implement counter-intuitive service centre designs (i.e., lean thinking) in manufacturing organisations. The emerged methodology fills a very important gap of how manufacturing organisations should manage and implement lean thinking service design in their call centres. Conventional managers usually perceive improvements in services as a financial burden that is avoided in most of times in order to reduce operational costs (Nix, 1998). This is particularly not the case when the improvement in services is on the basis of lean thinking model, which, through system waste elimination and demand analysis, can produce a process flow that will reduce costs (Seddon and Brand, 2008). In terms of direct effects, focusing on demand analysis and flow of processes is vital for the exposure of waste and the causes of failures in the system; eventually this provides a straight forward solution for the optimisation of resource utilisation (Ohno, 1988; Jackson, 2008). This is what Seddon (2008) has described as “the paradox: focus on flow and costs will fall, focus on costs and costs will rise”. This conventional management perception about lean thinking made it necessary to create an implementation methodology that can provide an initial evidence of improvement and cost reduction prior to actual implementation.

The results suggest that leadership availability is the cornerstone for the lean thinking implementation success. However, the leader has to be at a high level of calibre to motivate people and create emotional bonds with them (Kim et al., 2009). This is vital to inspire and convince subordinates of transferring the way they think about work operations (Anand and Kodali, 2009). More importantly, the leader has to provide mechanisms and rationale for the lean thinking introduction. It is apparent then that a ‘transformational leadership’ (Maslow, 1968; Burns, 1978) is what raise the lean thinking to a higher level of being accepted and valued in the workplace. In other words, available transformational leadership has a special influence on performance and followers when introducing organisational change of this type (Masood et al., 2006). Another major implication of the availability of transformational leadership can be related to the formation of a committed intervention team. Team members were sourced from those

employees with high levels of stress and those who showed tendency to absenteeism and turnover; leadership showed commitment to employees with problems found in the old system that exposed them as supportive leaders. It was believed that this type of supportive leadership has participated in the creation of a clan culture (Cameron and Quinn, 1999). It is at this culture where intervention team members were encouraged to follow teamwork principles, be involved in the project actively and continuously, in addition to the ability of members to raise suggestions and create changes regarding the redesign of their own service operations.

Figure 1 Lean thinking implementation methodology (see online version for colours)



In the context of this research, the identification of methods and techniques to increase support and acceptance to the lean thinking principles was associated with the presentation of hard evidence for improvement. The intervention team used the process flow charts and demand analysis as a confronting, but also curiosity creating, tools to attract the attention to the potential value that can be pulled from the systems in terms of waste reduction and performance improvement. This is controversial to the traditional tools usually used in call centre industry of using financial figures to convince senior management of business changes or departmental effectiveness (Seddon, 2007). Nevertheless, showing financial improvements are very important to facilitate management acceptance and involvement. Robinson and Morley (2006) have found that senior management sees call centres as a means of reducing costs and customer service is seen as a second class priority. However, this conventional 'one-goal' intent of having call centres did not help their contribution in the organisational effectiveness. In fact, organisational effectiveness is closely related to goals achievement (Robey, 1991). Lean thinking, in this regard, was able to show savings and cost reduction as a result of the identification of economical ways of executing demands and optimisation of resource utilisation. This will shift the image of call centres from 'cost reduction centres' to 'business intelligence and profit generation' (Nix, 1998). Thus, the capacity building tools and the senior management confronting tools used in this methodology are also long term departmental effectiveness enhancement strategies.

Nevertheless, the emerged methodology for lean thinking implementation in manufacturing organisations is particularly useful for transforming the human side of the call centres without much infusion of technology. The lean thinking, this way, is an economical way to improve the work in relatively short time (Seddon, 2005).

7 Conclusions

In this study an attempt was made to present a step by step methodology for the implementation of lean thinking design model for call centre service operations in manufacturing organisations. The methodology consists of six steps and a decision criterion, and is based on the ability of showing improvement evidence prior to senior management approval and full roll in of employees in the service department. This is done due to the counter-intuitive, but often significant, nature of the lean thinking benefits. The methodology is useful as it could be used as a sensing tool for senior management reactions in the early stages of the project. It provides lean thinking leadership with alternative recommendations for steering efforts to confront senior management reactions.

Based on this methodology, a set of prerequisite foundations have been identified before attempting to get the senior management approval; leadership availability, lean thinking justifications and intervention team readiness. However, the focus of justifications is on system waste reduction and performance improvement that could demonstrate financial savings. In practice leadership availability is the corner stone for successful implementation. The requirement of leadership, however, is to be of the 'transformational leadership' (Maslow, 1968; Burns, 1978) type which is able, through its influence, to leverage lean thinking support and build organisational capacity.

Acknowledgements

The authors would like to gratefully acknowledge the constructive and helpful feedback that reviewers have provided for this work.

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