

Title Page

Title: “An empirical study on the factors conducive to productivity and their relative significance in improving efficiency and performance in the office environment”

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Abstract

The research examined the area of lean office with the aim of identifying means through which office efficiency could be improved. The researcher conducted primary and secondary research into the topic of lean office. He researched relevant material in books, journals and websites and used a questionnaire to survey a representative sample of office staff in the West of Ireland.

The primary research indicated that the lean office concept wasn't widely used among the respondents' companies. However, the respondents in general indicated a high level of satisfaction with the adequacy of office equipment, the layout of the office, safety levels in the office and with the levels of staff interaction. There were also high levels of satisfaction in relation to how the role of the respondents contributed to the overall results of the company. A majority of the respondents indicated that their companies measured productivity, had productivity targets and that their company had obtained at least one quality standard.

However, in the matter of waste, a lesser majority indicated that forms and processes had been examined in their company with a view to eliminating such waste. Respondents gave examples of where waste occurred under the seven main areas of waste.

The philosophy of lean wasn't applied as commonly as the researcher expected but in general the results from the questionnaire indicated that efforts were being made to make the office as efficient as possible. As the drive to improve competitiveness increases, increasing efficiency in the office can't be overlooked and the philosophy of lean can play an important role in achieving high levels of efficiency.

Chapter 1: Introduction

Context of the Research

According to Tom Grohne (WMEP.org), a manufacturing specialist at the Wisconsin Manufacturing Extension Partnership (WMEP), one of the most common problems facing businesses nowadays is that “front office processes take too long” and that “they are not as responsive as they could be and should be, for both internal and external customers”. The adoption of lean as a philosophy in a non-manufacturing context is the subject of this study. In today’s economic environment, businesses must work hard to survive.

Johnson and Kaplan (1987) believe that traditional organizational performance measures either have lost, or are rapidly losing, relevance to modern organisations. The new focus is rather on adopting a “lean” philosophy and on eliminating waste. Their belief is that businesses that follow this approach stand the best chance of survival. To survive, businesses need the office to be as efficient as possible in eliminating waste and adding additional features to their final product or service which end-customers perceive as adding value to the product. Drucker (1985) agrees with this sentiment as he declares, “Quality in a product or service is not what the supplier puts in. It is what the customer gets out and is willing to pay for.” Drucker goes on to say “Customers pay only for what is of use to them and gives them value.”

In order to ensure profitability, focus must be placed on both quality and productivity. Gummesson (1991) posits: “Quality, productivity and profitability are triplets; separating one from the other creates an unhappy family”. However, before examining the literature on this subject, the meaning of “lean” in a business context will be further examined. According to Tapping (2005) lean office offers an ordered approach and clear steps for workplace organization, order and cleanliness. This is achieved by placing employees in charge of their own workplace, assisting a team and company focus on the causes of waste and its subsequent elimination, establishing standards for basic neatness, exhibiting to customers and co-workers that a clean office environment is a foundation for good work flow, improving employee morale by ensuring the office is safe, clean and something to be proud of.

Background to the research

In recent times increased attention has been focused on developing lean concepts.

Comm et al (2000) state that “industries strive for leanness, because being lean means being competitive by eliminating the non-value added practices”. Nonetheless, there is not much evidence to support a standard lean practice strategy; each company has unique circumstances which must be taken into account when implementing lean.

NIST (2000) outline some of the benefits which can be obtained from implementing lean office as a philosophy. Lean Office can improve safety, quality, productivity and delivery while reducing lead times and costs. These factors combined should help improve customer satisfaction which is the overall goal in any business. Employees need to ask themselves the question would they buy the product/service they are selling. This is where lean office comes in. Office waste is anything that prevents or limits customer satisfaction. Emiliani and Stec (2005) outline some of the reasons why senior managers have become interested in adopting Lean principles and practices. They believe that it results in many benefits. Among these are: higher quality products and services, increased market share, margin expansion, revenue growth, higher productivity, better customer focus, faster response to changing market conditions, and higher asset efficiency.

According to studies conducted by Tonya (2004) as cited in: http://www.managementguides.com/samples/Office_Lea_n_sample.ppt Lean played a major part in reducing time spent on various task in contrast to the time that is spent in using traditional methods. His study documented examples of lean reducing sales order cycle time being reduced by 59% from 23 hours to 9 hours. Engineering change order cycle time was reduced by 91%. Response time to customer quote requests was reduced by 83% from 66 hours to 11 hours and errors made by company employees fell by 69%.

Schiele (2009) in his article ‘*Lean thinking encompasses tools and techniques to eliminate waste*’ suggests that lean thinkers do nothing without considering how their work affects the customer and how they can improve the overall effectiveness and efficiency of the processes they use to meet customer needs. Lean thinking, when applied in this way, underpins an organization’s culture and its employees’ way of viewing the work they do every day.

In contrast, the article ‘*Implementing Lean in Office*’ documents some of the reasons given why many organizations are not implementing Lean in the office include lack of data

collection, lack of definition of values and wastes in office or administration environment and lack of well-defined process flow of office work.

Focus of the research

The primary focus in the research being conducted relates to lean in the office. In a general sense lean aims at eliminating waste and using the savings to either reduce the final cost to the end customer or including features which the customer perceive as adding value to the end product or service.

Buzby *et al.*, 2002 state that there are many diverse, often conflicting, definitions of Lean. “Lean” was first defined in 1990 in Womack’s book entitled *The Machine that Changed the World* (Womack *et al.*, 1990) as follows:

- A dynamic process of change driven by a systematic set of principles and best practices aimed at continuously improving.
- A total enterprise philosophy including everything from the shop floor to the executive suite, and from the supplier to the customer value chain.

Similarly, NIST (2000) define Lean as a systematic approach to identifying and eliminating waste through continuous improvement. Suzuki (1987) defines the term “continuous improvement” as an incremental improvement of products, processes, or services over time, with the objective of reducing waste to improve workplace functionality, customer service, or product performance. Nightingale (2000a) describes Lean as involving “less” in terms of less waste, less design time, less costs, fewer organizational layers and fewer suppliers per customer and “more” in terms of more employee empowerment, more flexibility and capability, more productivity, more quality, more customer satisfaction and more long-term competitive success. Thus, According to Liker (1997) and MIT (2001) the fundamental principle of lean is the focus lean places on providing value-added activities for its end customers.

The New Improvement Frontier (2005) documents how lean differs from established approaches. Established approaches generally seek to improve efficiency by saving miniscule amounts of time all over the place from the value adding activities. Lean provides a more

complete solution by attacking the true waste in any process. In keeping with such an approach academics such as Hines *et al.*, (2008) and Holweg (2006) have discussed the concept of a “Lean lifestyle”. This concept focuses on generating change not only in the technical aspects of the organisation but also within its culture. Overall, the philosophy of Lean can be likened to the Japanese concept of kaizen (continuous improvement), which Imai (1986) highlighted as a key to Japan’s competitive accomplishments.

Toyota Motors were the original founders of the lean principle and Ohno (1998) documents how Toyota’s focus remains on reducing their timeline through eliminating non-value adding activities from when they receive the order to when they collect their money. In conjunction with this line of thought, Womack and Jones (1996) posit that anything which does not add value as perceived by end-use customers but which adds cost can be regarded as waste.

While in theory lean should benefit all those who implement it, lean must be applied in an appropriate manner if it is to succeed. In some businesses, lean is seen as a synonym for cost-cutting and redundancies, understaffing and overwork of workers. Studies conducted by academics such as Post and Slaughter (2000), Varnon (2003) and Womack (2003) reveal that in practice, a number of senior managers view lean as a means by which to decrease labour costs, typically through layoffs. Further research conducted by Emiliani *et al.* (2003) Dyer and Hatch (2004) Womack, (2003), (2004a) and Spear (2004) has shown that in implementing lean principles senior management typically mismanage some or all of its aspects.

Oseland (1999) suggested that the debate about office performance should move away from cost reduction towards staff performance. If at all possible, lean should be a stakeholder-based system of management, not another management practice that favours shareholders over all other stakeholders (Toyota, 2001; Emiliani *et al.*, 2003). The lean process should have a number of benefits for employees. If the firm is more competitive, employees’ job security should improve which in turn ought to lead to greater job satisfaction. In his book ‘*Creating a lean culture*’ Mann (2005) suggests that, in terms of creating a lean management structure, the discipline, daily practices and tools needed to institute and uphold a concentrated focus on process are crucial. This process focus upholds and broadens lean implementations and allows a lean culture to develop as the practices become routine.

If lean is to be successful in practice, it needs the appropriate circumstances in which to thrive. An example of lean not being suitably applied is documented by Sprigg and Jackson (2006) in a multi-company examination of call centre management. The study found negative consequences for employee self-esteem and performance in “leaner” call centres. Sprigg and Jackson (2006) found that their workers relied on a partial interpretation of lean application with very unusual definitions used to measure leanness.

Of course, the leanness of a particular enterprise must be measured relatively. Comm and Mathiesel (2003), state that an organization can benchmark itself against best internal operations, external direct competitors, and external functional best operations or against generic functions to measure the relative value of its leanness. In order to benchmark oneself, suitable metrics must be chosen. Metrics are performance characteristics used to assess whether or not an entity is lean. According to Kaplan and Norton (1992), “effective measurement must be an integral part of the management process.” They suggest using a Balanced Scorecard approach as a means of measuring company performance. This Balance Scorecard consists of:

- *Customer perspective* – how do customers view the enterprise?
- *Internal perspective* – what does the enterprise excel at? How can the enterprise maintain a competitive advantage?
- *People* – the focus is on innovation and learning. Can our people continue to improve and create value?

Financial perspective – how does the enterprise look to its stakeholders (gifts, grants, endowments)?

These measurements will provide the organisation with an insight as to the areas in which they can strong, areas in which they can improve, areas in which they satisfy their customers in ways that rival companies can’t match. The company can use this approach as a means through which they can measure their performance. The balanced scorecard can work in conjunction with lean in measuring the performance of the company.

The Research Objectives

The Research Question

“An empirical study on the factors conducive to productivity and their relative significance in improving efficiency and performance in the office environment”

Aims of this research:

- The primary objective of this research is to investigate the factors which improve productivity in the office environment primarily through the means of lean office. The study will analyse these factors with a view to determining their relative contribution to productivity.

The secondary objectives of this research are to:

- Conduct an analysis of what measures organisations are taking to increase productivity in their office environment and the benefits resulting from these measures.
- Examine how organisations are engaging in promoting office productivity and the methods by which they are promoting this activity and communicating their vision to employees.
- Examine organisations understanding of office lean concepts and how top management put these concepts into practice.
- Examine whether organisations are affiliated with any body of quality improvement and identify what measures the organisation is taking to obtain quality certificates and standards such as ISO's.
- Use a questionnaire to determine what office improvements are being used. This will help categorise the change into various areas and weigh up the significance of each area in terms of productivity. The research involves consulting with people working in an office environment. The answers received will give a great insight into contemporary issues facing office staff as they strive to increase productivity.

Difficulties you perceive or anticipate in achieving your objectives

In conducting this study a number of constraints must be taken into account. The study is restricted in the numbers of workers it can survey due to the difficulty of gaining access to companies. Although the questionnaire will not enquire into specific practices within companies, companies or organisations may fail to see the benefits of such a study and any results must be qualified on this basis. The usual problem of achieving an adequate response rate from each targeted office will apply to this study as will the problem of participants not completing the questionnaire in full. Another difficulty is that participants may complete the questionnaire in accordance with what they think the surveyor wants to read rather than in accordance with their own views. Finally, the timescale for completing this study is limited as time must be allowed to compile and analyse the results. Therefore, the researcher's objective is to provide two weeks in which the questionnaire must be completed which is a relatively narrow timeframe.

Role in conducting the Research

In conducting this research the researcher hopes to gain an insight into the challenges facing companies in striving to achieve leanness and reduce lead times in their office environments. In carrying out this research, the student will assume the role of an interested researcher and an agent for change.

Summary of the Findings

The research conducted found that of those who responded, the vast majority (68.1%) did not work in a lean office. Only 17.6% of those who responded had received training in the area of lean office. These findings indicate that lean hasn't been fully accepted as a means of achieving greater quality, efficiency and profitability. However, the results of the questionnaire also documented strong user satisfaction with quality of office equipment, office equipment layout, office equipment layout with regard to safety and encouraging staff interaction and employees understanding of how their efforts contributed to the overall organisational performance. A slight majority of respondents indicated their company had examined forms and processes with a view to eliminating waste. Productivity measurements and targets were in place in the majority of companies and the vast majority of companies had obtained at least one quality standard and in many cases more.

Chapter 2 Literature Review

Lean Background

Singh et al (2010), state that the concept of lean manufacturing originated in Japan after the Second World War. The Japanese understood they could not afford the substantial investment necessary to build facilities similar to those in the USA and therefore looked at other ways to increase productivity through the implementation of lean manufacturing. Singh et al (2010) affirm that the goal of lean manufacturing is to reduce waste in human effort, inventory, time to market and manufacturing space; to become highly responsive to customer demand while producing quality products in the most efficient and economical manner.

Toyota, the Japanese car manufacturer, is acknowledged as the originators of lean manufacturing. In Liker's (1997) book '*The Toyota Way*', he outlines fourteen principles and their implementation. These are documented in full in the appendix A. Some of the points most relevant to lean office include:

1. Management decisions have to be founded on a long-term philosophy, even if this negatively affects short-term financial goals.
2. Leaders must be developed who comprehensively understand the work, live the philosophy, and can educate others on its benefits.
3. Exceptional people and teams must be established to implement the company's philosophy
4. Leaders and teams operate in the belief that if the process is right the results will be right
5. Standardized tasks are the basis for continuous progress and worker empowerment
6. It is important to see the processes in action to comprehensively comprehend the situation
7. Learning through continuous reflection and continuous improvement assists the organization in its future development

Liker (1997) also identifies tips for transitioning a company to a lean enterprise which are also documented in the appendix B. Some of the points most relevant to lean office include:

1. Learn by doing first and training second
2. Make participation in the transition to lean compulsory
3. Be proactive in recognizing opportunities for immense financial impacts
4. Metrics must be realigned with a value stream perspective
5. Lean leaders should be selected from within the company and a clear succession system ought to be developed

Implementing a philosophy of lean in an office environment

Although Womack (1990) originally proposed that lean “refers to the total enterprise: from the shop floor to the executive suite”, the philosophy of lean remains closely associated with manufacturing processes. In this context, Toyota is one of its best proponents. Womack et al. (1991) document how during the 1990’s Toyota came to fame as being the most reliable Japanese automaker in terms of product and process, in a country where quality and efficiency are regarded as essential economic components. This efficiency was achieved initially by focusing on seven types of waste - Processing, Waiting, Conveyance, Overproduction, Motion, Inventory and Correction.

However, during the mid-1990s, a number of researchers such as Sandelands (1994) and Avery (2003) (cited by Piercy and Rich (2009)) began advocating the benefits of a lean supply strategy outside of the manufacturing context. Subsequently, Toyota has extended the philosophy of Lean to its sales and marketing arms. Other companies also sought to apply this philosophy in a non-manufacturing context. For example, Vinas (2004) highlights Kato Engineering’s successful application of mapping and problem solving to reduce sales-order processing time and quotations processes; Chaneski (2005) highlights Brent River Machine Contract Manufacturing who used value stream mapping to look at order and accounting systems; while Wallace (2006) reports on a major focus on lean efficiency within Boeing where the principle was transferred into office and administrative systems to support shop-floor improvements.

The expansion of lean into pure service and administrative areas has been deemed by several researchers to be as an extension of shop-floor level manufacturing change. Office systems such as order-receipt, quotation, sales processing, accounting and human resources improved with the application of corresponding lean principles and basic tools to those used in manufacturing (Juroff, 2003; Holmes, 2007; Demers, 2002 as cited by Piercy and Rich, 2009).

Despite these developments however, the philosophy of lean typically remains connected with manufacturing, perhaps since the philosophy is easier to apply in this context. According to a number of researchers, (Emiliani *et al.*, 2003; Fiume and Cunningham, 2003; Womack, 2004a) it has been found that senior managers generally understand Lean as a “manufacturing thing” and thus its application within a non-manufacturing or office environment has been limited. Difficulties remain with applying the philosophy of lean successfully in a non-manufacturing context. Indeed, the efforts of many manufacturers to initiate and uphold quality programmes within office environments have frequently proven tremendously complex and have failed to accomplish their intended outcomes.

Creating a lean office may require more effort than creating a lean manufacturing unit. Imbedded customs, the lack of process visibility and lack of employee acceptance can hinder change. As stated by Mann (2005) “Improvements in the office will be no faster than in the factory and in some cases you won’t see results as quickly”. Another problem with creating a lean office is the difficulty of measuring knowledge worker productivity. Knowledge work is not easily visible or quantifiable. Such employees’ tasks are not fixed and have no production standard times and since these tasks can be performed differently by different workers, measuring the productivity of such employees is much more difficult than it would be, for example, in the case of assembly-line workers.

Bacon-Blackwell (1994) documents that a survey of 2,500 workers across a broad range of UK sectors shows that 82 per cent of managers, administrators and office workers have never been educated in how to work more effectively in computerized office surroundings. As a result of this, they are under continuous pressure, struggling with a surplus of reports, projects, telephone calls, e-mail messages and faxes.

Despite the associated difficulties, the implementation of lean administrative practices is vital if an enterprise is truly to be regarded as efficient. Bitner and Hubbert (1994) suggest that a customer’s overall satisfaction with a service is “based on all encounters and experiences with that organisation”. Therefore, if office processes are not working efficiently, company performance will deteriorate significantly, regardless of the design, innovation and quality of the physical product.

Thus, as competition intensifies, companies are recognizing that the office can’t be ignored as a potential source of competitive advantage. In addition, in the case of manufacturing industries, office functions are time-consuming and costly. In *‘The New Improvement*

Frontier' (2005), for example, it is estimated that, in the case of some manufacturing industries, office functions, from design and development to marketing, quoting, order entry, scheduling, purchasing and accounting, can represent 60 to 80 percent of the lead-time. Mmtc.org documents that 70% of labour cost is typically attributed to above-the-shop-floor activities such as service, support and administrative operations and in most manufacturing companies office operations can account for between 25 and 35 percent of cost-of-goods sold. Therefore, the application of the lean philosophy within the office environment has the potential for big reductions in costs as well as major improvements in customer service.

Hines et al. (2004) state that lean has evolved from being merely a "shop-floor-focus" on waste and cost reduction, to an approach that contingently sought to enhance value to customers by adding product or service features and/or removing wasteful activities. Lean Methods and Tools are applicable to all employees. For example, organizing office activities sequentially causes difficulties, with lots of waiting for information at each step in the process before it can commence. Waiting for signoffs and signatures of approval or waiting for technical information from whoever has it can be costly for an organisation. Therefore, anyone who is searching for information, or is attempting to complete a task or anyone who must go through several lines of command before decisions can be made can benefit from lean office.

Making lean an organisational success

Papadopoulou and Zbayrak (2005) believe that leanness should be viewed as a holistic approach that transcends the boundaries of the shop-floor thus affecting, apart from the production itself, almost all the operational aspects, e.g. design, development, quality, maintenance, etc. as well as the entire organization and management of the company.

Bowen and Youngdahl (1998) state that lean principles are increasingly being applied to service companies with the objective of improving customer service thorough the elimination of waste.

Henderson and Larco's book *Lean Transformation* (1999 p.42) suggests that in a true lean enterprise workers from the top of the organization to the bottom know their role in the organisation. Employees aren't defined solely by their job title; their role is providing value to the end customer. Once an organisation's employees buy into the principle of lean, the employees have acquired a mindset that requires the incessant quest for brilliance in order to

advance the mission of the organisation. Lean players appreciate that everyday tasks are absolutely necessary and must be executed with care and efficiency; it is the recognition that the smallest tasks combine to create the whole.

Ioma.com (2008) suggests that a starting point in implementing lean office is to ensure that 'all metrics are tied to the overall strategic goals of the organization'. The right set of metrics will help lean teams focus on the right things and measure their progress. The article quotes a company executive who states, "If you don't track metrics, you're only practicing." Lean must be grounded in improvements both to productivity and ultimately to profitability which is the bottom line of every company. Processes must be put in place to capture the benefits derived from implementing lean. This may involve passing on the price reductions generated from the elimination of non-value adding activities or the provision of the better quality product or service to the end customer due to the value added from the costs saved.

To achieve the desired results of increased productivity, efficiency and profitability it is necessary to put the right people in place to ensure the lean philosophy is given the necessary backing. Many companies short change their lean efforts by failing to assign full-time people with deep knowledge of—and expertise in—lean principles. As Hines and Taylor (2000) suggest, the methodical attack on waste is also a systematic assault on the factors underlying poor quality and elementary management problems.

Henderson and Larco (1999 p. 47) also identify empowered teams as representing a key attribute of the lean enterprise. The lean enterprise differs from the traditional enterprise in that, the role of leaders and supervisors is to motivate, coach, train and facilitate the work of those adding value, rather than to tell them what to do.

As the article *Growing through Waste Elimination* (2008) suggests, lean is often justified by the presence of perceived threats or opportunities such as:

- falling customer satisfaction;
- emergence of new competition; or
- Improving financial performance.

While lean is ideal for addressing these and other problems, it is worth noting that thriving companies can also reap benefits from its deployment.

sales office. Tiplady states that “As economic conditions toughen, no business can afford to ignore the scope to use lean to transform their whole enterprise.”

However, before describing the implementation of the lean office it must be noted that not all researchers believe that the implementation of lean will result in a company achieving greater success. Hamel (2000, p. 2), refers to the concept of “corporate liposuction”; that in a review of 50 companies, including some notable Fortune 500 companies such as Kodak and Unisys, 43 suffered a significant downturn in earnings after three years of implementing lean.

Lean Issues

Every organisation is a collection of processes, serving internal or external customers. Many of these office and service processes have hardly been touched so far. Reform of these processes is one of the great opportunities in the years ahead.

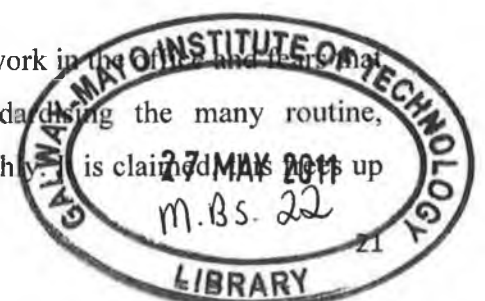
The main benefit of a Lean Office is that you can turn things around much quicker, sometimes dramatically so. For some businesses, first-pass yield might be as low as 5%, leaving vast room for improvement. Lean Office can also lead to cost savings from the reduction in paperwork and overall improved efficiency. For example, it can give a competitive advantage when it comes to quotes, since the company that returns the quote the fastest often gets the work.

A common problem in attaining this overall efficiency in the office is the lack of an understanding of how all jobs are interconnected. Employees focus on their own job responsibilities and departments work to meet departmental measures. As Jerry Thiltgen, WMEP manufacturing specialist says “No one has stepped back and asked, ‘How does this whole process satisfy the customer?’”

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Therefore, the first step in a Lean Office project is an Office Value Stream Map, which “looks at the flow of information from the time a process is triggered until the total task is completed,” Grohne states that when a process needs 30 minutes of work but takes a week to get through the system then the task becomes determining how to shrink the lead time.

There are also a lot of misunderstandings about standardising work in the office and that standardisation will stifle creativity. Identifying and standardising the many routine, repeatable steps enables the routine process to run more smoothly. It is claimed that standardisation is claimed to be built up



time for creativity in responding to individual customer needs or designing new ways to create value for them. Proponents of the lean office see the time saved as an outlet for creativity which leads directly to better employee satisfaction along with more secure jobs.

Not all commentators view lean as the cure all for an organisation's problems. For example, Dove (1999) details how the lean organisation may become very susceptible to the impact of changes. The leanness achieved by the organisation may lead to reduced flexibility and less ability to react to evolving conditions and circumstances. Dove (1999) believes that agility in organizations is fundamental to its existence. He asserts that agility has become even more important for organisations in recent times because the economic environment is changing faster than it used to, and faster than most organizations are capable of matching. Whether a lean organisation has the ability to react to changing conditions is an important consideration in whether to implement it.

Problems can arise if management's enthusiasm for the philosophy of lean is not shared by employees. In their article 'The Evolution of Lean Six Sigma' Pepper & Spedding (2010) contend that the belief that lean is pro-company, as opposed to pro-employee, has some validity. Many employees perceive lean as a redundancy threat. Many in the lower levels of organisations also hold the opinion that when problems arise management evade accountability letting it filter downwards onto the lower levels of hierarchy (Parker and Slaughter, 1994). The underpinning of empowerment and cultural change is a vital prerequisite for the success of lean. If management fail to approach lean with the correct goals problems will arise. Lean requires all in an organisation to review its organisational values and relies upon this to ensure its successful implementation, which in itself is essential to sustainability of lean. If the change in organisational values isn't forthcoming, the result will be an adverse affect on morale and increasing levels of worker unhappiness which will ultimately leading to operational failures (Hines *et al.*, 2004). Pepper & Spedding (2010) also posit that when applied as a detached philosophy, there is a limit to the scope and size of improvements achieved through the application of lean principles. Antony *et al.* (2003) suggest that this "ceiling" of improvement is reached because the strategy used for enhancement depends on the problem to be solved, and therefore must be aligned to achieve effective results.

Managers who wish to introduce the concept of the lean office by making relatively minor adjustments can make use of non-academic texts such as '*Getting things done*'. Allen (2001)

agrees that organizations are in a constant state of change. Goals, products, partners, customers, markets, technologies and owners are among the elements that frequently change in an organisation. These changes result in the organisation having to shake up its structures, forms, roles and responsibilities to keep pace with its evolving situation.

He outlines his beliefs about how individuals can achieve stress free productivity in the workplace. In preparing to implement lean office he believes individuals must get a sense of the volume of materials which must be dealt with. He suggests that employees should gather the materials in one location and begin the process of eliminating those elements that are unnecessary. Once everything that requires attention is in one area it should enhance both focus and control.

He identifies the desktop as a good place to start in eliminating clutter. Typical items on a desktop may include stacks of mail and memos, phone slips, collected business cards and notes from meetings. This information needs to be prioritised and the user must question how important these materials are to their work.

Desk drawers are another area of major concern in de-cluttering. Countertops are a section where the materials being used must be streamlined. Often, piles of reading material, mail and miscellaneous folders and support materials for projects will be left there. Cabinets are ideal areas for hoarding large supplies and reference materials and often hold a much larger array of materials. Floors, Walls and Shelves may need to be investigated including pictures, artwork, plaques or decorations, outdated books, catalogues, manuals or stacks left on the floor.

He believes that once all physical items in your environment have been collected, they will need to be processed. All items must be identified, it must be decided what the item is, what it means and what you're going to do with it.

When de-cluttering there is likely to be a number of items which at present aren't of particular importance but that may be important at a later date. A clear and consistent decision needs to be made on issues which may be of importance in the future. The issue to be faced is whether these should be written on a "Someday/Maybe" list or put on a calendar. If there is something that needs to be done about an item, a decision must be made as to what exactly that next action is. In other words the next physical, visible activity required to move

the situation toward closure must be identified. You then have three actions once you decide what the next action really is, do it, delegate it or defer it.

Whatever new system is put in place it should be a system that gets instant buy-in from all parties. If the new system fails to get support at the start and isn't carried out by all staff members immediately it is more than likely to fail.

Allen (2001) identifies seven primary categories that should be tracked and managed from the point of view of an organization. These are:

- A "Projects" list
- Project support material
- Calendared actions and information
- "Next Actions" lists
- A "Waiting For" list
- Reference material
- A "Someday/Maybe" list

In attempting to categorise all material the overriding concern is that all categories are kept perfectly distinct from one another. In conducting this analysis it must be taken into account that many actions can only be performed while in the office. An example of this is if there is a phone and a computer in the office then you will have 'calls' and 'at computer' as distinct lists. Standing meetings and people you deal with on a regular basis may need their own agenda lists. For example, staff meetings, project meetings, board meetings, committee meetings deserve their own files in which you collect things that will need to be addressed on those occasions.

He suggests that actionable e-mails and paper should be separated from the rest. Sometimes it will make sense to write reminders on a list or it may make more sense to use the originating documents. This will depend to a great extent on logistics. Reminders should be in visibly discrete categories based upon the next action required. If the next action on a service order is to make a call, it should be in a "Calls" group. If the action step is to review information and input it into the computer it should be labelled "At Computer".

A projects list should be drawn up which will contain a comprehensive index of all projects listed. It should be designed so as to provide a quick review whereby a quick glance allows you to enhance your underlying sense of overall control. There are a number of ways to organize reference material. The most common methods include General-reference filing, large-category filing, rolodexes and contact managers, libraries and archives. If material is solely for reference, the issue to be decided is whether it's worth the time and space required to keep it.

The need to implement changes such as those suggested by Allen is obvious when we read the results of a survey carried out in the United Kingdom by Kardex Systems as cited by Carr (2005). Over £1 million is wasted on a daily basis finding lost files. Kardex's managing director claims that "6 percent of the United Kingdom's 2.1 million businesses admit to losing at least one file per day – that adds up to 120,000 lost files. By this estimate, poor filing practices are costing UK businesses £1.2 million every working day or more than £240 million a year".

Organisations must ask whether greater efficiencies could be achieved through the use of more modern technology. They must also ask the question, are their facilities appropriate for their needs? Greenemeier (2003) states that, "the digital age of documents is producing some benefits. Networking copiers, fax machines, and printers are getting more intelligent, and they improve workflow by letting users guide documents and images to precisely the right output point for their desktops". This can be of major benefit to organisations and can help them achieve the desired 'leanness' in their office.

Modern technology has led to the introduction of the paperless office. Scott (2003) studied tax and accounting professionals and from his studies he determined that there is a legitimate chance that they can reduce their paper loads dramatically with the introduction of the paperless office. However, he does include a warning by stating that many fail to treat electronic files in a careful manner and until that changes, the lack of good procedures will take everyone back to square one, whereby it will be as difficult to locate documents in the paperless office as it is in the more traditional office setting where hard copies of documents are filed.

Sellen (2003) argues against the paperless office. He suggests the World Wide Web has only increased the amount of printing done by users. According to Sellen (2003) paper consumption has increased by approximately 40 percent since the introduction of electronic mail. He argues that instead of getting rid of paper, new technologies either increase or shift the ways in which paper is used. He concludes that banning the use of filing cabinets will only see persons finding new and innovative ways to store paper.

Waste and the lean office

Russell and Taylor define waste as “anything other than the minimum amount of equipment, materials, parts, space and time which are absolutely essential to add value to the product” (Russell and Taylor, 2000, p. 737). An article in *Managementguides.com* outlines some examples of office process waste. These include: too many signature levels, obsolete databases/files/folders, purchase orders not matching quotations, errors – typo’s, misspelling, wrong data, employees waiting – for information, poor office layout and unnecessary E-mails. Other general areas which a *slideshare.net* document believes may cause problems relate to there being no appropriate monitoring of database accuracy and security, not enough space for filing, unavailability/difficulty locating documents/information or wasting time finding them and high IT investment but little software training leading to a lot of manual instructions.

According to Wireman (2009) the basis of lean involves the elimination of waste. He classifies waste under three main headings: Any activity that does not add value, Waste due to variation and waste caused by overstressing people, equipment, or systems.

A document entitled *Leaner and Fitter* (2008) describes waste elimination as identifying and removing unnecessary steps in organizational systems and processes that naturally evolve to become needlessly intricate. Without effective management of this waste, there is limited scope to improve the service provided to customers.

The document states that trimming costs has its place but also possesses limitations. Removing waste through lean frees up additional capacity for growth without the need for

extra capital investment or an increase in labour costs. However, they view trimming costs as inherently short term.

Waste in this sense refers to identifying and removing unnecessary steps in organizational systems and processes that naturally evolve to become needlessly intricate. Without effective management of this waste, there is limited scope to improve the service provided to customers.

Waste in one area can cause and produce other types of waste such as overproduction. For example, if employees are left waiting they want to do something, often resulting in needless operations being performed and additional waste being created. In very basic ways the elimination of waste can help other problems be identified. For example, a broken electrical socket may not be detected because of the inventory piled up in front of it.

Waste seeps into and contaminates all activity and may not be immediately obvious. For example, while computers have in some ways increased productivity by automating certain processes, there is strong evidence that the speed of these machines has intensified the paperwork blizzard facing executives, thus creating another type of waste. Before waste can be pinpointed and eliminated and before any changes are made to current processes, specific tasks and activities should be studied. "Process mapping" can be used for this purpose (Damelio, 1996; Tucek, 1997). Process mapping helps discover the non-value-added steps within current procedures and helps guide the worker towards removing them. Through actual documentation of current specific tasks, a better appreciation of existing processes is gained. Process mapping, as an industrial engineering technique, should be used by office workers themselves to discover where waste, inconsistency, and irrationality exist in the workplace, to make the work easier, and to produce better products or services more quickly and cheaply. The benefits of process mapping when done by the users of the process (in this case office workers) are many: it helps users to visualise the flow; it makes it possible to see waste and causes of waste; it provides a common understanding and language about processes; it creates a buy-in for workers which will ease implementation and it forms the basis of an implementation plan for the elimination of waste (Julien, 2005).

Structure Waste

Apart from process waste, structure waste may be an issue in an office environment. According to Lareau (2003): “Structure waste transpires when existing behaviours, expectations, procedures, rituals, regulations, roles and priorities do not reinforce, guide and coach optimum behaviours for reducing surface waste”. Thus, while surface waste refers to, for example, the inefficient use of office equipment, structure waste refers to problems within the management and practices of the organisation which encourage or at least do not reduce such surface waste.

As the name suggests, structure waste may prove more difficult to eradicate than surface waste. In eliminating structure waste, it is suggested emphasis should be placed on processes, with the intention of altering actions and keeping them changed long enough for them to become new behaviours. Thus, employees should be assigned a series of new small actions that are relevant to their duties and work areas. Since these actions are supported by management there is a critical mass of people involved to provide sufficient rewards for new actions. Lareau (2003) refers to this concept as “office kaizen”.

Once waste and the causes of waste are recognized, a plan for its elimination should be formulated. Attacking waste in this disciplined manner may also serve as a methodical assault on the factors underlying poor quality and basic executive problems (Hines and Taylor (2000)). In drawing up this plan, it is imperative that the business communicate with their customer to find his needs and wants, since meeting the needs of customers is the purpose behind the lean office and since what constitutes waste is determined by the perceptions of customers.

Customer Needs

In addition to examining customer needs, it is also important to look at the organisational structure in designing a plan which will help to improve service delivery and reduce waste. Thus, the demands placed on the organisation by the customer must be considered alongside the operational capability to deliver services to the customer (Chenet *et al.*, 1999; Deshpandé *et al.*, 1993, 1997). How the service encounter is nested within the broader organisational

structure that determines service delivery and customer satisfaction needs to be considered (Bitner, 1990; Narver and Slater, 1990; Kohli and Jaworski, 1990). A balance must also be maintained between the speed of delivery of a service and the quality of the service provided as many management performance systems designed to improve delivery have tended to focus on speed of service delivery rather than, and usually at the expense of, quality service delivery (Seddon, 2003; Marr and Neely, 2004). Thus, in formulating a plan to improve the delivery of service, Adam et. al (1995) has suggested that six broad requirements should be considered:

1. Service output has to be seen as the value for the customer and from the perspective of the customer.
2. Service output must be defined by its quality level.
3. The customer must become a part of the productivity concept.
4. Measures of productivity must be more customer-related.
5. Dynamic indicators of productivity must be used instead of static output/input measures.
6. Situation specific measures have to be available to allow for the complexity and diversity of service operations.

The Seven Main Areas of Waste

The *Lean Six Sigma Pocket Tool book* defines waste 'as anything that your organisation is doing to the product or service that the customer is paying for and probably should not be'. It also identifies the seven main areas of waste are: Overproduction waste, waiting waste, transport waste, over processing waste, inventory waste, motion waste and defect waste. Slideshare.net '*Lean Office*' identifies eight service industry wastes. These are errors in documents, transport of documents, doing unnecessary work not requested, waiting for the next process step, process of getting approvals, unnecessary motions, backlog in work queues and underutilized employees.

Chaneski (2005) identifies some areas where time can be wasted in the office. Chief among these is waiting. This happens as frequently in the office as it does in the factory. Examples include, waiting for approvals (both customer and internal), vendor information or financial

information amongst others. Chaneski (2005) also posits that many office personnel are cross-trained and capable of doing many different jobs, yet are often assigned restricted responsibilities, such as entering orders, generating invoices or ordering materials. The more functions a person learns, the more valuable he/she is to the organization. He also identifies excessive motion as another waste that runs out of control in the office. Searching the office for paperwork, supplies, quotes and specifications can waste as much time as searching the factory for work orders, tools, equipment and materials. Office functions must be organized to avoid some of the excessive motion and wasted time associated with looking for things.

Lean Office Case Studies

The Lean Office Event was a programme developed by employees with the purpose of eliminating waste from the office environment. Such an event can improve customer focus, streamline processes, reduce paperwork, increase awareness, reduce re-work, reduce lead-time, resolve open issues and improve communications (*Lean Administration: Case Studies in Leadership and Improvement*).

Chaneski (2005) identifies examples of companies who have used lean office to improve their efficiency. One company eliminated the need to print, sort and mail an acknowledgement of each order. Prior to this, each time an order was entered; an acknowledgment was routinely printed, manually sorted and mailed to each customer. A review established that surprisingly few clients wanted an acknowledgment and those that did said that an e-mail response would suffice. The company thus changed its order processing system to code any customer seeking an acknowledgment, and then routinely acknowledge these customers via e-mail at the conclusion of the order-entry process. This change freed up overworked office staff to permit them to spend more time on value-adding activities.

Another company established that employees wasted time searching for hard copy files. Regularly, one customer service representative was working with a file and another would not be able to find it. The company employed six customer service representatives; there was annoyance as straightforward questions necessitated calling back the customer. The obvious answer to this quandary was to keep electronic records on the system. Unfortunately, a great deal of information was only accessible on hard copies. The cost of transferring these documents to electronic format was not justifiable. As a short-term move, the business

executed a “do not take” rule to the files. Tables were set up at the file cabinets where files were to be reviewed and copied if necessary. This stop-gap measure reduced search time to the absolute minimum and the company developed a long-term plan of electronic file allocation.

Richard Schonberger (1990) documented this cell in his book “*Building a Chain of Customers*”, average order entry lead-time fell from one week to one day, while variation in lead-time fell from six weeks to one week. The distance travelled by a typical order was reduced tenfold.

The services environment

Lovelock (1984) defines services as “all those economic activities in which the primary output is neither a product nor a construction”. The service industries in developed countries have been continuously increasing relative to manufacturing. Murdick et al (1990) document how in the USA, during the past 15 years, the non-goods-producing sector of the non-agricultural labour force rose 52 percent, versus 38 percent in the goods-producing sector. Fitzsimmons and Fitzsimmons (1994) concur with this view. Their research suggests that in the USA service sector employment rose by approximately 30 percent from 1982 to 1994, and at the time accounted for approximately 78 percent of all jobs, while the manufacturing sector has remained fairly flat.

Service industry by its nature involves a lot of repetitive tasks. Lean regards repetitive tasks as crucial to the overall success of the organisation. Consistently successful completion of routine tasks assists a company in achieving its goals. According to Krajewski and Ritzman (1999), service environments with repetitive operations, with high volumes, and with tangible items such as mail, checks or bills usually derive the greatest benefit from application of ‘just in time’ principles.

Process Mapping

In implementing lean it is imperative to have a tool by which progress can be mapped. George et al (2005) identify process mapping as a tool which companies may find useful in attempting to implement changes.

The key principles of process mapping are as follows:

1. Observation Rather than documentation will provide managers with the clearest idea of problems as well as potential solutions.
2. The flowchart in itself should be looked upon as an instrument through which change can occur rather than an end.
3. Project restrictions should be clearly outlined in the process map.
4. The process of creating the map should involve a cross-section of those who work in the process.
5. Procedures should be put in place to guarantee that process maps are living documents.

In examining each stage of a process it is important to take into consideration such areas as capacity and its constraints and time traps. Time traps insert delays into a process and can create long lead times. Identifying time traps is a key focus when the goal of the project is to improve efficiencies.

According to the article "*Lean Office Champion*" documented in *mmtc.org* real lean office savings can be achieved in a wide array of areas if the appropriate steps are taken.

Table 1

Issue	Savings
Lead Time	30-60%
WIP	30%
Labour Hours	40-60%
Costs	40%
Space	10-20%
People Travel	50-70%
Document Travel	40-60%

Value Stream Mapping

The first step in a lean transition is to identify value-added and non-value adding processes. Rother and Shook (1999) believe that Value Stream Mapping emerged to fulfil this function. Slack et al (2007) state that value stream mapping visually maps a product or services production path from start to finish. It records not only the direct activities of creating products and services but also the indirect information systems that support the direct process. Value Stream mapping can be used to determine the scope of the project as it defines the current state and desired future state of the system. In order for an organisation to become truly lean value stream mapping must be methodically applied before other tools such as 5S are applied.

Slack et al (2007) identify value stream mapping as a four step process for identifying waste and suggesting ways in which activities can be streamlined. The value stream must be identified, the process must then be physically mapped, problems are then diagnosed and changes suggested and finally the changes are implemented. With regards to the application process, Rother and Shook (1998) base value stream mapping on five phases put into practice by a special team created for such a purpose. The phases are:

1. selection of a product family;
2. current state mapping;
3. future state mapping;
4. defining a working plan; and
5. achieving the working plan.

5S Technique

As documented by George et al (2006) 5S' stand for Sort, Set in order, Shine, Standardize and Sustain. 5S is the process for ensuring that work areas are meticulously kept clean and controlled with the objective of cutting waste and optimizing productivity and quality through maintaining an orderly workplace and using visual cues to achieve more consistent operational results (Moriones *et al.*, 2010). According to Sarkar (2006) it changes the mindset of staff and involves the entire organisation in improvements. Bicheno (2000) identifies 5S as

fundamental to achieving a lean business and can be equally applicable to the shop floor or office.

Moriones et al (2010) give a detailed explanation of how the 5S practice is essential whenever a workplace is cluttered or disorganized or wherever people have to spend time tracking down tools or information required to complete a task. They discuss all five elements of 5S, outlining the key areas which come under each heading.

In implementing the 5S method, sorting is the first goal. This involves confiscating all items from the workplace that are not required for existing tasks. Items that haven't been used over a period of time or are not expected to be used are weeded out. The yardstick used with regard to sorting is "when in doubt move out". Only the basics should stay. In general, bits and pieces such as unneeded files, paperwork and reference manuals, outdated posters, signs, notices and memos amongst others should be removed. Cables and wires located on the floor should be sorted and an investigation into whether walls, equipment and partitions are covering in outdated material should be performed.

The second step involves simplifying or setting in order. Setting in order involves arranging essential items in the area, identifying and labelling them so that any person can locate them or put them away. A current and future state map should be drawn and the workplace should then be visually organized. Boundaries should be depicted to distinguish between work areas. A home address should be assigned for each bounded area and a corresponding label should be placed on each item. Shelving and filing cabinets should be labelled, marked and include a visible code. Documents, files and binders identification should indicate a number, date or the name of a person in charge. Easiness of use is paramount. The fundamental question is whether documents, stationery, materials are well ordered, easy to reach and easy to return.

The next step is Shine, which involves keeping the work area clean and free of debris. In order to meet Shine targets a housekeeping schedule should be set and responsibilities assigned, measures should be formed for continued daily shine processes, periodic inspections and targets should be set for machinery, equipment, computers and furnishings. Floors, carpets and walls should be clean, a person should be assigned responsibility for updating files and ensuring wastebaskets are regularly emptied.

Standardization is step four in the 5S technique. Standardization involves creating a consistent way of implementing tasks which are performed daily. It means doing the right things in the right way every time. The location of files, books, articles and stationery should be available readily, there should be a process in place for dealing with confidential documents and there should be a clearly defined shared filing system.

The final step involves sustaining the 5S program to ensure its continued success. This involves performing a 5S audit form, periodic schedules must be established for conducting audits, checklists for visitors to review and celebrate accomplishments and continued improvements should be put in place. Team meetings involving specific areas should be carried out regularly. Activity schedules, departments, tasks and performance indicators should be clear. Audits should take place regularly and a timeframe should be established outlining when documents will be disposed of.

An important element in introducing 5S into a business is documented by Sarkar (2006). Prior to introducing 5S, it must be ascertained whether there are quality frameworks in place at present in the business. If there are other quality methodologies in place, how 5S dovetails with these must be taken into account.

Gapp et al., 2008 view 5S as being framed in the “lean” philosophy. They believe that 5S encourages workers to enhance their work surroundings and assists them in learning to reduce waste, unplanned downtime, and in-process inventory.

The concept has gained popularity because “5S creates a work environment that is clean, well-organized and efficient. It provides your organization with a rapid, visible achievement while preparing your workforce for other advanced improvement efforts.” (5S–Visual Workplace,” <http://www.tpslean.com/5s.htm> as cited in Howell, 2009)

Sarkar (2006) also identifies some of 5S benefits. He suggests the process changes the mindset of employees and facilitates continuous improvement. It eliminates time spent on non-value adding activity which affects individual and workplace efficiency. He also suggests it creates a solid foundation for future work in the quality arena. 5S is a highly effective tool if implemented correctly.

In adopting 5S the reasons for its use must be outlined. Common reasons outlined by Sarkar (2006) for implementing 5S in the office environment, include, removing workplace clutter, building a quality culture, eliminating waste, generating a prevention mindset, improving customer service and generating faster information retrieval. George et al. (2005) recognizes the 5S technique as crucial in creating and maintaining an organized, safe and high performance workplace. However, Ahmed and Hassan (2003) hold a conflicting view of the value of 5S, describing 5S as a housekeeping activity rather than tool to be used in the lean framework.

As defined by wmep.org, some other effective Lean Office tools include:

Standardized Work: In every office opportunities exist to standardize work. Forms and checklists can be revised so that they collect all needed information before being passed along. Standardizing processes may be necessary, as different people doing the same job usually come up with their own method which involves a risk of different outcomes being obtained. Staff members who develop a standard procedure will often reach a consensus that reflects the best practices of everyone, making the process even better.

Levelling: The amount of work in an office isn't constant. Lean Office provides proactive measures to respond to busy periods. Levelling can also be used to balance high- and low-priority tasks.

Office Layout/Work Cells/Teams: Sometimes the office layout needs to be rethought in terms of the organizational structure. Most front offices are organized by function, with, customer service, purchasing and engineering departments. This isn't the optimal solution when you have a value stream focus. Cross-functional teams can greatly increase efficiency, since the team understands the overall process and is not focused on a single task.

Specific Elements of the Lean Office: The Office Building and Layout

<http://sbinfocanada.about.com> identifies some key factors which may be taken into account when attempting to implement lean office. In becoming lean, all waste in the office setting must be eliminated or placed in a clearly defined area. Eliminating waste in the office includes not just elimination of unnecessary physical items or paperwork but the greater utilisation of office space to facilitate employee interaction, efficiency and safety. Bootle and Kalyan (2002) report that £18 billion a year is wasted through the inefficient use of space. This is waste in the office process and the savings generated from an efficient office layout would assist organisations in offering value added services to their customers.

Clearing pathways is identified in the <http://sbinfocanada.about.com> article as the first area to be tackled. Furniture must be positioned to allow staff to move around.

The desktop should be cleared. Employees must ask themselves what has to be there. The fundamental question office workers must answer about items is whether it's absolutely essential that the item in question has to be on their office desk.

The article identifies stacking trays as ideal for employees' "inbox" and "outbox". Increasing the functionality of the office design and make some more work space available will assist efficient working. Investing in a book shelf can be useful in reducing the clutter. The office design should be adjusted as is most appropriate to individual circumstances.

With regard to the physical design of the office, there is a widespread acceptance that an office building must be designed to accommodate the information and knowledge processing activities of an organisation, duties such as filing, planning, designing, supervising, analysing, deciding and communicating should be easy to conduct. Improvements in office design can help to improve workforce productivity and help the office move towards being a lean office. Indeed, Stallworth and Kleiner (1996) theorize that advances made in the physical design of the workplace could boost the productivity of the workforce by between 5-10 per cent. Consequently, Salway (1986, p.50) argues that high priority should go to meeting the needs of office occupants to ensure their workplaces provide the required level of potential capacity to supply a service at an acceptable cost.

The design of the office is also important in creating linkages between employees. Laing (1991) proposes that the standard office design can impede productivity and creativity, as it tends to be based on people working on their own, and offers little possibility of interaction with other office colleagues. Therefore, in order to respond to these changing needs, the focus in the literature has been on the concept of 'flexible office'. Becker (1990) and Duffy (1990) are among the most noted pioneers of this concept. They suggest that offices or workstations are extremely underutilised. They argue that work is increasingly a series of formal and informal projects, requiring groupings of individuals for limited and variable periods of time. To facilitate such groupings, people rather than fixtures should be moved.

In keeping with this concept, Metters and Vargas (2000) believe that in certain situations coupling front office and back office jobs can be a feasible strategy, meaning that the same employees carry out both front office activities (FO) and back office activities (BO). Similarly, Becker (1990) and Gibson (1998) indicate that space efficiency can be achieved by sharing office space, and producing a profile of uses and activities, so that staff go to a location where at any given point in time it makes common sense to work in, because it may be quieter, or there may be others there with whom they wish to work together. To this end, McGregor (2000) advises that all successful enterprises should have "living" workspace strategies that can evolve as the organisation evolves and Marmot and Eley (1995) point to the need to embark on a detailed study of working inclinations to supply the best match of people to workplace settings. Thus, the key idea is that designs cannot remain fixed in time. Keane (1999) sums this idea up in the motto "never design a stage for today's props". This statement encapsulates the need to be strategically focused in terms of office design, to be flexible enough to accommodate today's needs and to be able to adjust easily to tomorrow's requirements.

Continuous Improvement Programmes

Quality certification system may also form part of a lean office strategy. Certification helps provide companies with a framework for quality management. Achieving quality certification for the quality standards being applied in a company's office is indication of the level of quality which the company has achieved based on independent and international measurement.

Total Quality Management is an example of a programme introduced to improve quality. An example of a set of quality standards a company may seek to acquire is the ISO 9000 family of standards for quality management systems. Douglas et al (2003) outline how the term ISO 9000 refers to both a single standard (ISO 9000) and to a set of three standards (ISO 9000, ISO 9001, and ISO 9004). ISO 9000 is maintained by ISO, the International Organization for Standardization and is administered by accreditation and certification bodies. The ISO preside over 19 different standards each of which will be applicable to various different companies.

There are many benefits associated with the ISO 9000 standards. In a survey in Hong Kong, Leung *et al.* (1999) found that the majority of respondents perceived ISO 9000 to be inexpensive and worthwhile and Buttle (1996a) found a strong willingness by those organisations that had attained ISO 9000 to recommend certification to others.

However, while the ISO 9000 standards help companies meet customer expectations and regulatory requirements, there are also problems associated with the standards, from the perspective of creating a lean office. First, the certification represents the base level of a quality system rather than a complete guarantee of quality. Secondly, such certification may have minimal effect from the point of view of quality management as the companies which apply for it are usually performing just as well prior to registration. Beattie and Sohal (1999) believe that the ISO 9000 standards are costly and involve a lot of paperwork. Moreover, research conducted in America by Curkovic and Pagell, (1999) cited the main criticisms of ISO 9000 as (a) that it is a paper-driven process (b) that it does not encompass the Total Quality Management principle of continuous improvement and (c) that the costs involved are too high. Companies must question whether certification is important in improving a company's overall efficiency and moving the enterprise towards being lean?

Research involving over 4,000 organisations performed by Chittenden *et al.* (1997), found only 110 respondents had encountered negative effects from ISO 9000. However, 53 per cent of those surveyed alluded to the administrative burden of the standard.

A study by Lee *et al.* (1999) also points to the fact that compliance with the ISO 9000 standards does not necessarily mean that maximum efficiency has been reached. This study of almost 400 ISO 9000 certified companies indicated that 70 per cent would like to move

beyond their ISO 9000 status while 26 per cent would maintain their ISO 9000 certificate with minimum changes.

Top Management Support

The support of top-level management is an essential prerequisite prior to venturing into a lean transformation effort. As Boyer and Sovilla (2003) posit, top management should exhibit commitment and direction. They must ally this with working to create interest in the implementation and communicate the change to everyone within the organization. As Henderson et al (2003) point out, lean is often radical for all stakeholders in a business. Lean involves modification of the core values and beliefs held by members of an organization or group. It can also alter long-established processes or policies that direct decision-making and the way people work together.

Top level management should set a clear vision for the organization or group focused on lean transformation and provide those involved with the time needed to learn and make incremental change. Successes should be recognised and celebrated, failures should be tolerated, an organizational culture should be created that supports experimentation and provides the resources needed for the training and development of those employees involved. As Henderson et al (2003, p.70) document, obstacles to the successful implementation of lean can include top management lacking appreciation of lean's strategic importance, their lack of specific skills or knowledge, their reluctance to empower workers and their fear of change.

In implementing lean the existing organisational structure will be a significant factor. If the organisational structure is a bureaucratic structure it may be a cause for concern as it will require an even greater degree of transformation to implement lean. Bureaucratic processes can have positive as well as negative influences. However, as McHugh and Bennett's (1999, p. 81) research documents those in a bureaucratic organisation often have narrowly defined and highly specialise jobs which act as an impediment in ongoing change efforts. Therefore, management should focus on removing any barriers which may prevent learning or keep individuals from adapting organizational practices. In contrast Pugh (1990, p.12) believes that the bureaucratic form must endure into the future.

Once top-level support is in place and barriers to change abolished, the focus turns to the development of performer-level commitment. People produce results. Therefore, lean thinking will not occur unless those responsible for doing the work are committed to making lean happen. Research undertaken by Maurer (1996) specified that one-half to two-thirds of all major corporate change efforts fail and resistance is the “little-recognized but critically important contributor” to that failure (p. 56). In addition, Kotter *et al.* (1986) remark that managers are inclined to approach change with a simple set of beliefs that end up exacerbating the problems that arise because they fail to understand them in any systematic manner.

Resistance is understandable, as there are a wide variety of individual personalities involved and a large number of interconnecting relationships that exist among people, resistance to change in certain quarters is inevitable. Staff must be deployed to work on processes they manage in order to demonstrate how lean thinking works and what benefits are possible. This should enable participants to:

- identify the value stream associated with a particular purchasing process;
- seek out waste and identify opportunities to create value;
- Move forward with rapid improvement events; and use a measurement and control system to establish longer-term sustainability.

As a consequence, employees should see the benefits which can arise from using lean principles and will increase their commitment and see that lean thinking is a sustainable way of managing their daily work. Seeking out and eliminating waste throughout a particular process is essential to the lean concept. However, it is also imperative that ways to redeploy those wasted resources to other more value-added activities are identified. The need to respond to conflicting interests and to deal with unforeseen problems requires an adaptable approach and openness to experimentation.

Whilst lean is concerned with reducing waste at all levels, it is also about changing corporate culture. Bhasin and Burcher (2006) suggest that if lean is to be successful there is a need to meet a number of criteria. They believe decisions should be made at the lowest level assessed by the number of organization levels. Hines *et al* (1998) suggest the company should have a definite clarity of vision, in other words, an indication of what the organization believes it will look like once the transformation is complete.

Bhasin and Burcher put forward a number of other points which will assist in the successful implementation of lean. The company must ensure that there is a strategy of change whereby the organization communicates how the goals will be achieved. Responsibilities should be assigned within the pilot programme initially and ultimately within the whole organisation whereby it is also evident who is championing the programme. Supplier relationships should be based on mutual trust and commitment. They suggest a learning environment should be nurtured. The customer should be the systematic and continuous focus of the organisation. Lean leadership should be promoted at all levels. The company should identify the proportion of an organisation's employees operating under lean conditions and the proportion of organisational departments pursuing lean. As demonstrated by Liker (2004), lean requires a long term commitment

The role of HR in relation to lean

According to (Henderson et al (1999) p.264) the Human Resource department has a significant role to play in the lean organization. Employees must be constantly educated in facets such as team building, lean enterprise and interpersonal skills. Systems must be in place for gathering, evaluating, reporting on, and implementing suggestions on ways to improve. Individual Contributions should be recognised, but financial incentives for individuals should not be present as they have a tendency to promote competition and discourage teamwork. Incentive plans should instead encompass entire groups.

In a study conducted by research teams based at the Universities of Bath and Warwick and detailed in the IPD report, *Getting Fit, Staying Fit: Developing Lean and Responsive Organisations*, based on detailed case study work supplemented by focus group discussions, it was concluded that leanness required the personnel function to play a variety of different roles, such as: a supporter of new working methods; an interpreter of leanness to specific work systems; a champion of employee behaviour within the change process; a monitor of work patterns; a resourcer; and an anticipator of change in the wider environment.

Office Innovation

Lean Office is often applied as part of wider organizational attempts to instigate changes which will make the company more efficient. A starting point for considering the nature of organizational change is Grundy's three 'varieties of change'. The three types of change proposed by Grundy (1993) include a smooth incremental change which evolves slowly in a systematic and predictable way. The second variety of change is bumpy incremental change, characterized by periods of relative tranquillity punctuated by acceleration in the pace of change. His third variety of change is 'discontinuous change' which he defines as 'change which is marked by rapid shifts in strategy, structure or culture, or in all three'. (Grundy 1993) Which variety of change will be applicable to a company will be dependent upon the environment in which they operate and will play a role in strategic decisions relating to how a firm conducts its business and how quickly change needs to be instigated.

In attempting to implement lean office the outside business environment will be a major factor in the degree to which radical change in processes is needed and the speed at which the change must occur. Also the industry in which the firm operates will influence how quickly change is required. Ansoff & McDonnell (1990) place environmental forces for change in five distinct categories: Predictable, forecastable by extrapolation, predictable opportunities and threats, partially predictable opportunities and unpredictable surprises.

The pressures of change have come from increased competition. Market economies have always been based on competition but competition was for years limited through government protection or industry and inter-firm agreements. Rightsizing and de-layering entered the English language along with the phrase 'lean'. Increasing competitive demands at the beginning work themselves out in terms of cost-cutting. Labour flexibility helps to cope with competitive pressures by cutting costs. How organisations, management and individuals respond to increased competition determines their chances of survival and growth. (White et al. 2004)

According to 'Managing to Change', 26% of workplaces are slimming down by de-layering, downsizing or both. They further divide these down into four categories

- Lean with neither 'high commitment' nor 'high-benefits' strategy. (12%)
- Lean with 'high commitment', but not 'high benefits'. (6%)
- Lean with 'high benefits', but not 'high-commitment'. (4%)
- Lean with both 'high commitments and 'high benefits' strategy (4%)

They state that the 'lean-mean' mix is equally distributed across workplaces of all size, with the smallest workplaces just as likely to adopt it as the largest.

Employee Engagement

Lean Office provides many advantages as opposed to traditional methods of doing business. In addition to the economic benefit of adding value for customers, eliminating waste and getting things done quicker than would be achieved using traditional methods of doing business, *Slideshare.net* outlines some benefits for employees:

Career Development- Lean Office is a marvellous tool in unleashing hidden potential in a company's workforce. It can provide staff with cross functional skills which will provide them with the flexibility needed to perform activities in various areas within the organisation. Employees work in the office and are aware of what works best in their own environment. When lean office is being implemented it enables workers to have a say in what they feel will work best. New ideas can be implemented and innovation is promoted.

Comfortable work place- Lean Office assists in making the office a safe place in which employees can conduct their daily jobs. Lean office helps provides greater space efficiency and is also much safer for employees. For example they aren't as likely to trip on cables or wiring. Their job can be completed much quicker as information is conveniently located at a point where everyone knows the information can be retrieved from. A clean, environmentally friendly area is much more enjoyable to work in, thereby improving efficiency and the mental well being of workers.

Open Communication- Lean Office promotes open communication. It helps encourage management and staff to converse and share their knowledge whereby management understand what works best for staff and staff realise the constraints placed on management.

Six Steps to Effective Change

As Dossenbach (2009) states, companies must recognise when change is needed, define the innovation needed, and implement it so as to stay competitive in the 21st century.

In implementing lean office it is essential to follow a simple and effective strategy to ensure that change efforts are implemented.

Beer et al. (1990) identify six steps to follow to ensure effective change:

1. Mobilize commitment to change through joint diagnosis of business problems
2. Develop a shared vision of how to organize and manage for competitiveness
3. Foster consensus for the new vision, competence to enact it and cohesion to move it along
4. Spread revitalization to all departments without pushing it from the top
5. Institutionalize revitalization through formal policies, systems and structures
6. Monitor and adjust strategies in response to problems in the revitalization process

However, change isn't a one size fits all strategy. Strebel (1996a, p.5) asserts: 'Those who pretend that the same kind of change medicine can be applied no matter what the context are either naive or charlatans'.

Potential Problems in Implementation

In their article *From lean to lasting: Making operational improvements stick*, Fine et al (2009) document how in their experience businesses neglect up to half of the potential savings when they employ or develop operational-improvement programs inspired by lean, Six Sigma, or both. Some companies set their targets too low; others fail to take into account how existing performance-management systems or employee mind-sets might undermine the implementation of lean and other performance-enhancing tools. Some make the mistake of underestimating the level of senior-management involvement required; whereby, responsibility for change programs are delegated to lean experts or Six Sigma black belts who are practitioners and technically skilled but often lack the authority, capabilities, or numbers to make change stick. Culture and other organizational factors will affect the goals of a program and must be a fundamental principle to be taken into account when implementing a change process, leading companies put what they learn into action. Sustainable benefits are reaped by balancing the program's hard and soft elements and developing their line managers' lean-leadership skills.

Research Methodology

Introduction

As part of this dissertation, areas in which productivity can be improved will be outlined with the focus being particularly on the area of lean office. The value of conducting this type of research is outlined in Donna Desrochers (2006) article “Higher Education’s Contribution to the Knowledge Economy” which suggests that in the United States, office jobs are the fastest growing segment of the economy having grown from 30% of all jobs in 1959 to 39% in 2006. In an Irish context, the productivity of office workers is important as such workers constitute a large proportion of those working in the tertiary sector, which accounts for forty-nine per cent of Ireland’s GDP.

This study will focus on the area of lean office and the factors affecting productivity in an office environment. The relative contribution of each factor to office productivity will be assessed, with a view to determining which areas of office productivity have the most scope for improvement. The end goal is to make the office as lean as possible and to improve the final service being offered to the customer while adding value to the final product or service for the end customer. As part of the dissertation, a questionnaire will be issued.

Bassey (1990) identifies the purpose of carrying out research as being to show something that was not known before and this study aims to achieve that goal on a small scale.

The objectives of the research

The objectives of the research are to provide an overview as to degree to which lean office is recognised in various organisations. The research will be conducted by using a questionnaire to determine the focus placed on productivity and efficiency in the office environment both in terms of measuring productivity and the degree to which productivity features in future business planning. Finally, the research will aim to identify areas within which productivity improvements and waste reduction can be achieved in the office setting with the overall aim of adding value to the final goods or service for the end customer.

The Research Design and the Roles of the Researcher

The researcher compiled a questionnaire and issued it to participants as well as making the questionnaire available for completion online. Having gathered the results, the researcher attempted to evaluate them and obtain a result on which to base the conclusions and recommendations of the thesis.

Having decided to select the area of lean office for further study, the researcher gathered the data. The tool most effective for the research being conducted is a questionnaire. Questionnaires have certain advantages. They can be administered quickly, there is a standard set of questions for all participants and therefore the design of the questionnaire was relatively easy.

The questionnaire was distributed by two methods, a web-based questionnaire and a paper-based questionnaire. By using both methods the researcher achieved a more balanced result.

Web-based questionnaires are more efficient than other data collection methods as responses are collected directly in a computer database, thereby reducing errors and saving time. This type of questionnaire allows responses to be gathered faster. For example, in a survey conducted by Shannon and Bradshaw (2002), 25 percent of responses received were within the first 24 hours. The researcher experience was similar in relation to response time to the web based questionnaire.

Another advantage of web-based questionnaires as outlined by Schleyer and Forrest (2000) is that they are more cost-efficient than their mail equivalent, telephone questionnaires and in-person interviews. However, as the researcher personally distributed the paper based questionnaires there were no mail costs and the personal contacts ensured that there was a greater likelihood of a high return of questionnaires. A study conducted by Ilieva et al. (2002) suggests that online surveys have a much higher item completion rate than mail surveys; and answers to open-ended questions tend to be longer with online surveys than with mail surveys. This was not the researcher's experience.

However, the researcher agrees with Evans and Mathur (2005) and Archer (2003) as to the convenience of online questionnaires. They state with regard to survey administration, online surveys are automatically placed into the database, and then tabulated and analyzed in a coordinated, integrated manner that greatly reduces costs. It is also easy to send reminders to non-respondents. However, Archer (2003) suggests several disadvantages to online surveys

as compared to mail surveys. One of these which haven't been mentioned above is the different screen configurations of various users which may make it difficult for certain participants to complete a questionnaire.

In spite of the advantages of the web-based questionnaire, not all individuals who work in an office environment can find the time to complete the survey online at work and they may have little or no access to the web outside of office hours so to rely completely on a web-based questionnaire may skew the results.

The survey was issued to office workers encompassing many different roles. This variety assisted in providing an overview as to the factors which workers perceive would help the office operate in a more efficient manner.

The primary research instrument for this study was the use of a questionnaire. This questionnaire was distributed to office workers in several different types of office environment in the West of Ireland. For example, employees in both the public and private sector were invited to participate as were employees from different size organisations in different sectors. While this questionnaire did not cover a sufficient population base to be significant for statistical purposes, it provided an insight into the factors conducive to productivity in various types of office environment based on case studies. It provided a measure as to the degree to which offices are currently lean. It indicated the scope that is available for companies and organisations in making their offices lean and provide greater added-value to their final customer.

Choosing the proper structure for a questionnaire is a critical factor in determining and ultimately obtaining unbiased feedback. In particular, each person involved in the process of analysing the data generated by a questionnaire survey will value the information differently and apply weight to factors which, in their opinion, are more meaningful. (McClelland, 1994)

The layout of the questionnaire will follow best practice guidelines for conducting employee questionnaires, such as the avoidance of open-ended or leading questions (where possible) and the use of statements for which the participant's responses can vary from strongly disagree to strongly agree, thus making it more likely that participants will provide focused answers. Another important consideration in conducting the research will be the assurance of anonymity for participants. Confidentiality is a vital tool in any study being conducted and all

measures will be taken to protect the anonymity of those who choose to answer the questionnaire.

According to McClelland (1994) there are many advantages in using survey questionnaires over other types of data gathering and research methods. First, he points out that they can be administered to a large population because they do not require individuals from different geographical locations to assemble in one primary place, and thereby avoid considerable cost. Secondly, he argues they are a non-invasive means for gathering responses, as opposed to individual interviews, focus groups, and sometimes on-site observations, because respondents can provide input in a tension free environment and at their convenience. Thirdly, McClelland (1994) believes that biasing can surface in individual interviews owing to the manner in which questions are posed by the interviewer and are perceived by the respondent which can skew the results. As questionnaires are usually relatively straightforward to answer, McClelland (1994) argues that the completion of questionnaires doesn't take an excessive amount of time.

Disadvantages of questionnaire

Self-selection may lead to results that do not represent the target population, although the effects of over/under representation can be mitigated through statistical measures. Those who have access to the internet are dissimilar in demographics to those who do not (Best and Krueger, 2000). This was confirmed in a survey of British executives conducted by Ranchhod and Zhou (2001). They found online respondents to be more internet savvy, to be heavier users of e-mail, and to have more years of e-mail experience. Wyatt (2000) states that the lack of control over the situation, places, moods, browsers and loading speeds means that questionnaire validity may be compromised. However, the research attempted to overcome this by issuing questionnaires to those without web access.

As far as is possible the questionnaire attempted to ensure that all questions were easily understood and there weren't be differing interpretations which may slightly skew the results. The questionnaire can possibly be slightly limited if it excludes a person from documenting their desired responses. This study hopes to overcome that potential problem by leaving a section at the end for participants to include anything extra which they feel may be worthwhile to add.

Questionnaire Issues

In deciding to use the questionnaire as the tool of choice for conducting research for this topic, the researcher has taken into account the time constraints within which the project needs to be performed. In using this tool the researcher also understands that the questions asked must be phrased in such a way as to be easily understood by participants. Also, despite the objective of the researcher to maintain anonymity for the respondents, the researcher realises that there are certain questions where the respondent may not be willing to divulge the information required.

McLelland (1994) outlines three types of response formats which can be chosen from when compiling a questionnaire. These consist of closed-ended or forced-choice questions, open-ended, or a combination of the two. In general, closed-ended responses are easier to document as the respondent is required to select from a predetermined set of answers. The researcher must be careful when designing the questionnaire to make sure that all possible choices are considered so as to attempt to ensure that the results aren't biased unwittingly. In contrast to closed-ended questions, open-ended questions elicit feedback from participants by requiring them to formulate a response in their own words. In conducting a questionnaire the researcher is trying to gather as much information as possible and by using open-ended questions as an entire question or part of a question, they hope to gather the information required.

Open Ended v Closed Questions

Vinten (1995) outlines the fundamental difference between open ended and closed questions. The closed question suffices where all that is required is to classify the respondent according to agreement or disagreement with some stated point of view. If the objective goes beyond this, and we wish to learn something of the respondent's own frame of reference, or how the viewpoint has been arrived at, then the open question is more appropriate.

Vinten (1995) outlines how open questions may also be referred to as "free-answer", "free response", "write-in", or "unrestricted" questions. He summarises how open ended questions merely establishes the topic for the respondent. It is left up to the respondent to construct an answer as they see fit. Vinten (1995) describes some of the benefits of open questions. Open questions are preferred by some researchers as it is considered that they carry less risk of

biasing responses and more chance of unearthing genuine attitudes and views. Open questions provide more valid responses than even carefully constructed closed questions because they allow respondents to reply in their own words. Respondents can state what is most relevant to them, without having forced them to guess the “right” answer, as may happen with closed questions. These advantages in turn become disadvantages for those pursuing responses through closed questions.

Vinten (1995) describes how closed questions may be referred to as “check answer”, “pre-coded” or “restricted” questions. Respondents don’t reply in their own words, but choose their answer from a series of pre-assigned categories that best fits their own views. Vinten (1995) states that closed questions have the advantage that they are easy to handle and cost less to administer and process. A closed question reduces interview time, lessens the need for training requirements for interviewers and also means that interviewers do not need to have a great deal of experience to use them successfully. They also reduce, and sometimes eliminate, coding time where many interviews have been conducted and the results are to be written up. For the reasons outlined above, closed question surveys/interviews are cheaper to analyze.

In designing the questionnaire, the researcher understands the need to keep the questionnaire brief and to the point while at the same time gathering sufficient information to generate some results. This will assist in keeping the attention of the participants. Respondents may answer superficially if the questionnaire takes a long time to complete.

Underlying Philosophical Assumptions

In describing the philosophical assumptions underlining research, Guba and Lincoln (1994, p.105) refer to ontology, epistemology, methodology and the paradigm. Ontological assumptions refer to the nature of reality. Reality is subjective and multiple as seen by participants in a study. The researcher by quoting the words of the participants can provide evidence of different perspectives. Epistemological assumptions refer to the relationship between the researcher and that being researched. The Researcher attempts to lessen distance between self and that being researched. The researcher collaborates, spends time in field with participants, and becomes an “insider”. Methodological assumptions refer to the methods and techniques used by the researcher to discover the reality.

A paradigm is an overall conceptual framework within which a researcher may work, that is, a paradigm can be regarded as the “basic belief system or worldview that guides the investigator”.

Philosophical Assumption Selection

The ontology or nature of reality that is the subject of this research is office productivity and efficiency. Ontology is chosen by the researcher as reality is subjective and multiple as seen by participants in the study.

In researching the topic the epistemology relates to a critical study of the validity methods and scope of the research.

The primary methodology is the questionnaire.

In literature, a set of concepts and their relationships is commonly called ontology (Neches *et al.*, 1991). As Colace *et al.* (2009) suggest ontology is one of the most effective tools for formalizing the knowledge shared by groups of people therefore it is the most appropriate tool for the research being conducted.

Idioms of Research

The term idiom refers to the vocabulary or usage of a specific group or subject. The research will be conducted into the area of lean office and office productivity. In attempting to achieve this goal: research books, referenced journals and websites relating to the area of office productivity will form the basis of the secondary research conducted. These sources have their characteristic idiom or vocabulary usage common to this subject and this will be incorporated in the report.

Selection of a Research Idiom

In assessing what the study hopes to achieve, the researcher will obtain as much secondary research as possible and will then select books, journals and websites to reference from that are appropriate to the question being researched.

Selection of the research method

Taking into account, the timeframe in which the research has to be completed, the most appropriate means of gathering a significant amount of information on a short space of time and the protection of the confidentiality of participants, the focus of the research will centre on a questionnaire which will be available to complete on the internet and in paper-format. Participants will be invited to complete the internet survey or they will be issued a hard copy of the questionnaire for completion. The aim is to gather information on lean office and office productivity and efficiency.

Sample Size and Sample Selection

There are diverse attitudes with regard to sample size and selection. Kahneman and Tversky (1972) came to the conclusion that untutored people generally disregard sample size in situations where it should play a role. Reagan (1989 p.57) commented: 'The lesson from "sample size research" is that people are poorly disposed to appreciate the effect of sample size on sample statistics'. In contrast George Gallup (cited in tpub.com) commented "Both experience and statistical theory point to the conclusion that no major poll in the history of this country ever went wrong because too few persons were reached."

The population to be studied in the course of this research was rather diverse as the workers surveyed ranged across companies in different sectors. The sample was obtained through sending E-Mails to a selection of offices in the West of Ireland used the Enterprise Ireland and IDA websites to obtain contact information. The researcher also used personal contacts to distribute the questionnaire to some offices.

The size of the offices in which information was obtained from ranged from a two person office to an office employing over fifty people. In some of the larger offices specific departments were targeted for the purposes of this study. The different work dynamic in different size offices provided material for comparative analysis. Ideally the population targeted would be spread evenly across the various sized offices and the response rate would mirror this. However, it was difficult to obtain such a balance and the study factored this into account when conducting an analysis of the information obtained. Furthermore, if there is a disproportionate response from one sector or the other, the results needed to be weighed accordingly.

Questionnaire Sections

The first section of the questionnaire will provide an overview of general information of the office worker. Areas covered under this section will relate to establishing what category of job the respondent belongs to, how many employees in the office will be an important determinant in how the lean philosophy can be or is being applied in the office environment, whether the concept of lean office is used and whether employees have received training in the area of lean office.

Section two focused on the office itself. The questions were useful in determining the efficiency of a particular office with questions on the adequacy of office equipment, the safety of the office environment, the layout of the office and how that layout may help or hinder staff interaction. Whether employees understand how their individual efforts contribute to the company's overall results was also examined. Finally an analysis was conducted on whether forms and processes had been analyzed to identify opportunities to eliminate waste.

The third section of the questionnaire focused on the attitude of the organisation to productivity. This section provided information on the present attitude within the company regarding the measuring and improving of productivity, whether measuring and increasing productivity is also included in the future plans. The questionnaire then examined whether the respondents' organisation has achieved quality certification, what standard of certification and if they haven't received certification a reason why not. A space was then left for the respondent to complete a section with any other issues they feel may be of importance.

Research Timeframe

January to April involved both the compilation of a questionnaire and an extensive review of the existing literature on the subject of office productivity. The pilot questionnaire was issued in the first week of May. The final questionnaire was issued at the end of May with mid-June as the cut off date set for responses. The month of July was spent analysing the returned questionnaires. The research was collated throughout August to provide a conclusion based on the primary research available and secondary research undertaken.

Why you feel it was worthwhile

This research is worthwhile because it adds to the existing body of knowledge by examining the various factors contributing to office productivity in an Irish context. In light of the current economic climate, the productivity of the Irish workforce is a topic worthy of examination. In particular, the productivity of office workers is important as such workers constitute a large proportion of those working in the tertiary sector, which accounts for forty-nine per cent of Ireland's GDP. It is, of course, much easier to conduct an analysis of where productivity gains can be made in a manufacturing setting. However, the reality is that the manufacturing sector in Ireland has declined in importance as the tertiary sector has grown. Therefore, the tertiary sector, in particular the office setting, is the new area where productivity gains must be made. Finding the appropriate office structure, the most productive work practices and the minimisation of waste and work practices has become even more important as firms seek to maximise output in a time of economic uncertainty.

Data Gathering Phases

As documented by Naylor et al (1966), research objectives in business and economics, as well as in most social sciences, usually take the form of:

- Questions to be answered;
- Answers to be tested; and
- Estimates to be arrived at

The respondents will be provided with a two week timeframe in which to complete the questionnaire. Reminders will be provided to respondent after week one and once the cut off point comes the data gathered will be used to come to a conclusion with regards to results.

Ethical Considerations

In conducting this survey anonymity is a key consideration and prior to the issuing of the questionnaire, the respondent will get a form to sign which suggests that all information obtained will be used solely for the purposes of this study and will not imply any information with regard to their personal circumstances or position.

Data must be presented honestly. As McLelland (1994) states “a survey code of ethics must also be adhered to, in that the data produced must be presented in a manner which faithfully represents the facts as they have been found. Survey data should not be subject to manipulation, either statistically or in summary, so as to support or refute only special-interest views.”

Data Analysis Techniques

As the information derived from the questionnaire in the main falls under a multiple choice question format, it is relatively easy to document most of the information gathered in the questionnaire. A number of questions are multi part questions where the second part of the question provides scope for the respondent to include any additional information they feel may be relevant.

Limitations of the research

In conducting this study a number of constraints must be taken into account. The study is restricted in the numbers of workers it can survey due to the difficulty of gaining access to companies. The companies will be contacted via E-Mail with an explanation as to what the survey is about and assuring confidentiality to those who respond to the questionnaire. Questionnaires will also be sent to contacts who work in an office environment and with company permission they may forward this questionnaire to other employees in their company for completion via the survey monkey online tool or through a paper based questionnaire if this makes the process easier to complete.

Although the questionnaire will not enquire into specific practices within companies, companies or organisations may fail to see the benefits of such a study and any results must be qualified on this basis.

The usual problem of achieving an adequate response rate from each targeted office will apply to this study as will the problem of participants not completing the questionnaire in full. Another difficulty is that participants may complete the questionnaire in accordance with what they think the surveyor wants to read rather than in accordance with their own views. Finally, the timescale for completing this study is limited as time must be allowed to compile and analyse the results. Therefore, questionnaires must be completed within a quite narrow timeframe.

Pilot Questionnaire

A pilot or trial run of the questionnaire was issued to a convenient sample of office workers with the objective of eliminating any difficulties in question interpretation or possible discrepancies in the questions. This was of vital importance in producing a professional questionnaire which asked the questions most likely to provide accurate results. It ensured that all questions were easily interpreted by an ordinary person and avoided all biases and ensuring that no questions asked contained double negatives.

By getting current office workers to complete a pilot questionnaire, feedback obtained from the questionnaire assisted in providing more pertinent points, some of which were incorporated in the final draft of the questionnaire. The pilot questionnaire assisted in identifying the type of issues which are contemporary for those working in offices that had experience of lean office techniques being implemented successfully or those who had seen efforts to implement lean office fail or those who haven't seen any attempt to introduce a lean office system in their office.

Having completed a pilot questionnaire it became obvious to the researcher that there were certain areas of the study which needed clarification if the results of the study were going to provide the researcher with the basis from which conclusions could be drawn with regard to lean office and comparisons made with other research conducted in this area. It was pointed out by those participating in the pilot questionnaire that some office workers would not all understand the terms value stream mapping and 5S and that although they might practice similar programs in their office environment they would not be aware of the names and would not indicate in their response that they practised these routines, thereby the results may be skewed.

The area on the seven types of waste needed to be explained further following the pilot questionnaire and again after the early results started to be gathered. It appeared that while the terms were understood, some respondents misunderstood the question and simply ticked or answered yes/no to each type of waste rather than providing examples of each type of waste in their office environment, having discovered this the researcher elaborated further on the question on the [surveymonkey.com](https://www.surveymonkey.com) website and this enabled a greater degree of information to be obtained for disseminating the results of the questionnaire.

The Research Findings

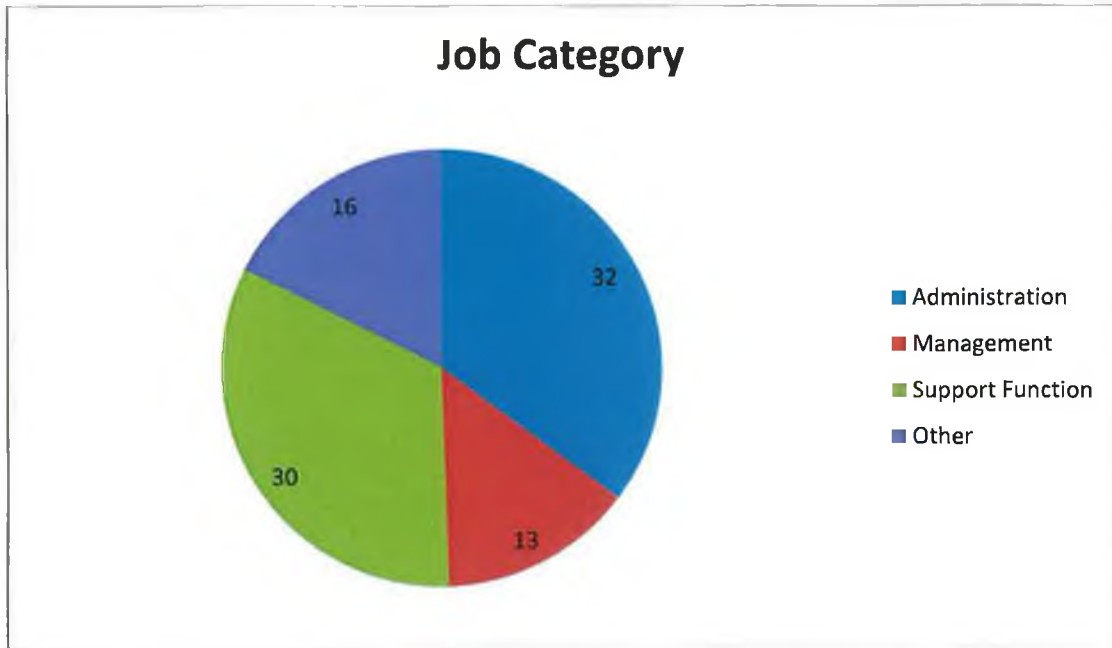
In conducting the research, questionnaires were issued in paper format to a number of participants working in an office environment. Questionnaires were also made available for completion online using the surveymonkey.com website. In order to achieve a high rate of response to this survey, the researcher e-mailed a diverse range of offices in the West of Ireland region, which varied both in size and in the sector in which they operated. The researcher used the IDA and Enterprise Ireland websites to obtain a list of company names and contact details. The researcher then e-mailed all companies for which information could be found. The E-Mail contained details of the study being conducted and an assurance of confidentiality if the reader wished to respond to the survey. The E-Mail provided a link to the website where the survey could be completed. The cover page to the survey fleshed out what was stated in the E-Mail. It provided extensive details as to the purpose of the study, a confidentiality statement and a couple of sentences thanking the participants for taking the time to complete the questionnaire. In addition to this a large number of paper based questionnaires were issued to contacts of the respondent.

Having issued the questionnaire and started to receive responses it became apparent that question 9 Part B needed elaboration as the seven types of waste weren't fully explained with regard to their applicability in the office setting. Therefore the researcher edited the online survey to provide a brief explanation as to what was meant by each waste. This helped the researcher achieve a much greater degree of accurate information from which more precise results could be derived.

As the responses to the questionnaire began to return to the researcher, the results were collected and analysed. In total there were 91 responses to the questionnaire.

Question 1

Figure A

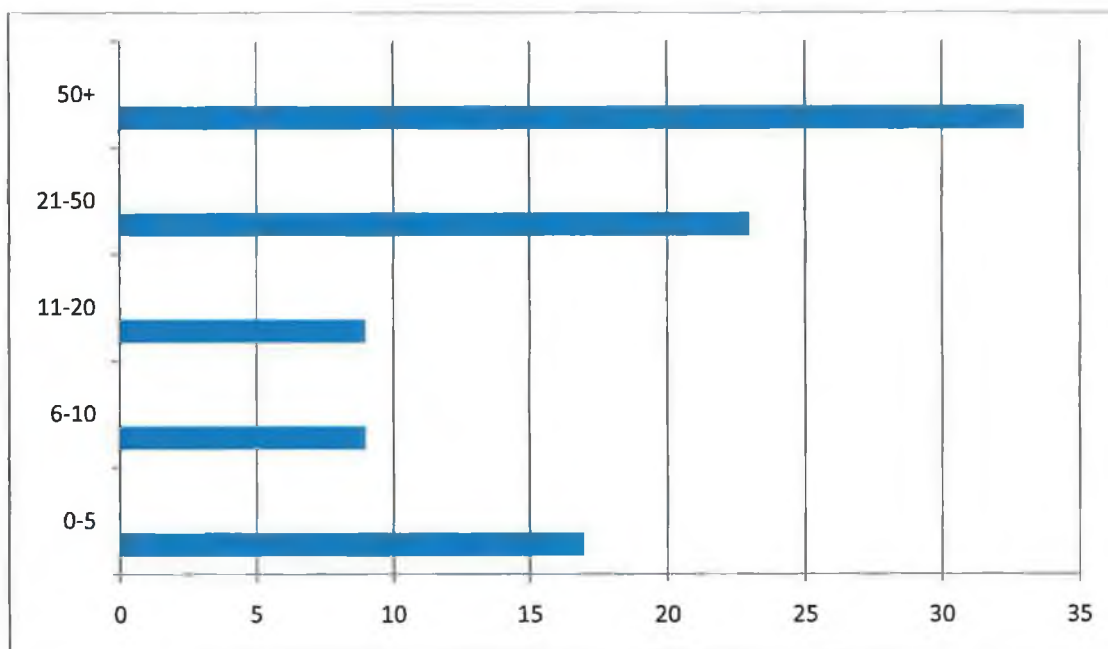


The first question of the survey was devised with the objective of finding out what role the respondents held in their respective company. The objective of this exercise was to determine from what point of view the respondent was seeing things. For example, a respondent who was involved in management may be less reluctant to criticise aspects of the organisation than those working in an administrative or support function.

Of those who responded to the questionnaire, those working in administration accounted for 35.2%, management 14.3 %, support functions 33 % and those not falling into any of the three categories 17.6 %. Of those who answered that their job didn't fall into the main categories of administration, management or support functions, their jobs included: accountant, customer facing, data entry and research, design, research, finance, process engineer, professional, support engineer, trainee (5), N/A (1). Many of these answers would be appropriate for placing in the categories of administration or that of a support function. This variety of respondents is necessary for the study as it provides divergent views as to the application of lean office and the degree to which various parties in the workplace are satisfied with how efficiently their office is run.

Question 2

Figure B



The next question in the survey was devised with a view to providing a background as to the type of office in which respondents worked. In analysing responses to the survey, the respondent needed to take account of the contrast in terms of size, between an office of 0-5 workers and an office with more than 50 workers.

Of those who responded to the questionnaire, 18.7% worked in an office with 0-5 employees, 9.9% worked in an office with 6-10 employees, 9.9% worked in an office with 11-20 employees, 25.3% in an office with 21-50 employees and by far the greatest percentage, 36.3% worked in an office with 50 or more employees. In conducting this research, the researcher was aware of the need to obtain a balance in relation to the size of the company relative to the application of lean office.

<http://www.census.gov/epcd/www/smallbus.html> reveals that figures from the USA in 2004 show that small companies are in the majority.

Table 2

No. of Employees	Percentage of firms
1-4 Employees	55.8%
5-9 Employees	20.9%
10-19 Employees	12.7%
20-99 Employees	10.6%

Although these results are from the US and could therefore differ with results from Ireland it is apparent that small companies are in the majority. In relation to Ireland, http://www.eso.ie/releasespublications/documents/other_releases/smallbusiness.pdf states that as of 2004, small businesses accounted for almost 82% of all industrial enterprises.

Therefore, the research conducted for this study may be slightly skewed as the majority of those who answered the survey worked in an office with 50 or more employees. However, due to the nature of the research, the short timeline and the difficulty in acquiring information as to the contact details of firms with small offices the results were always going to be skewed towards providing more information on larger size offices.

Question 3

As the basis of the study centred in particular on the area of lean office, in question 3 the researcher attempted to discover the prevalence of lean office in companies in the West of Ireland.

In relation to the third question posed on the survey, participants were asked whether the lean office concept was used in their office. Of those who responded, over 68% stated that the lean office concept wasn't used in their office.

In this context it is relevant to note that the article *Leaner and Fitter* (2008) documented that lean is not a one-off but a mindset that influences the introduction of business systems within an environment of ongoing change.

When the researcher linked up job description with the practise of lean office a pattern emerged.

Figure C



Figure D

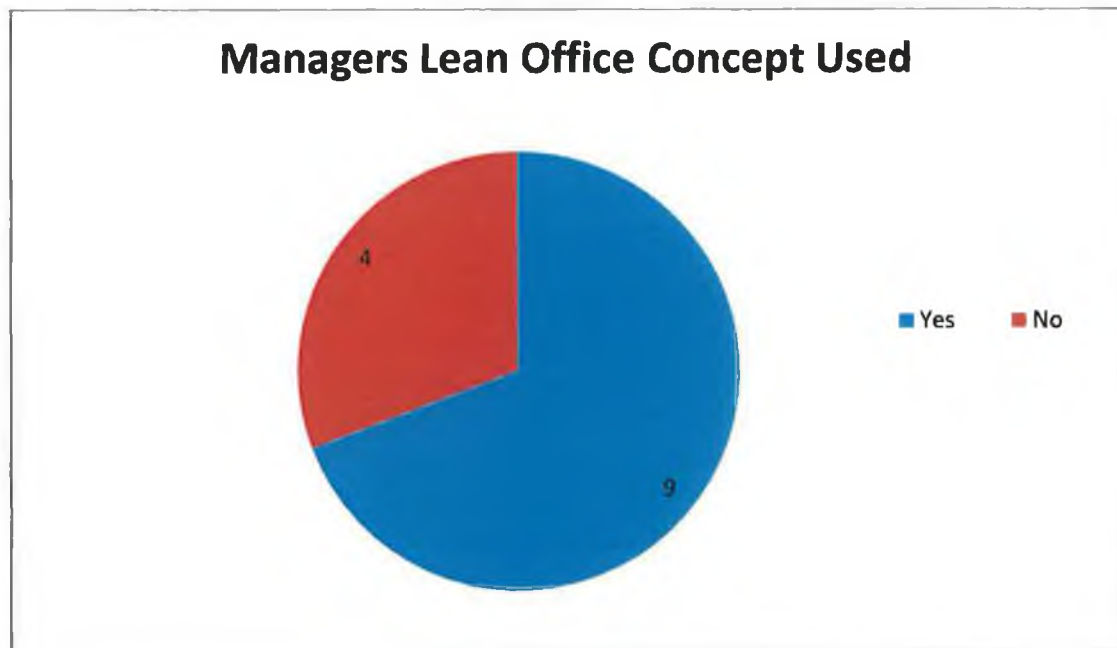
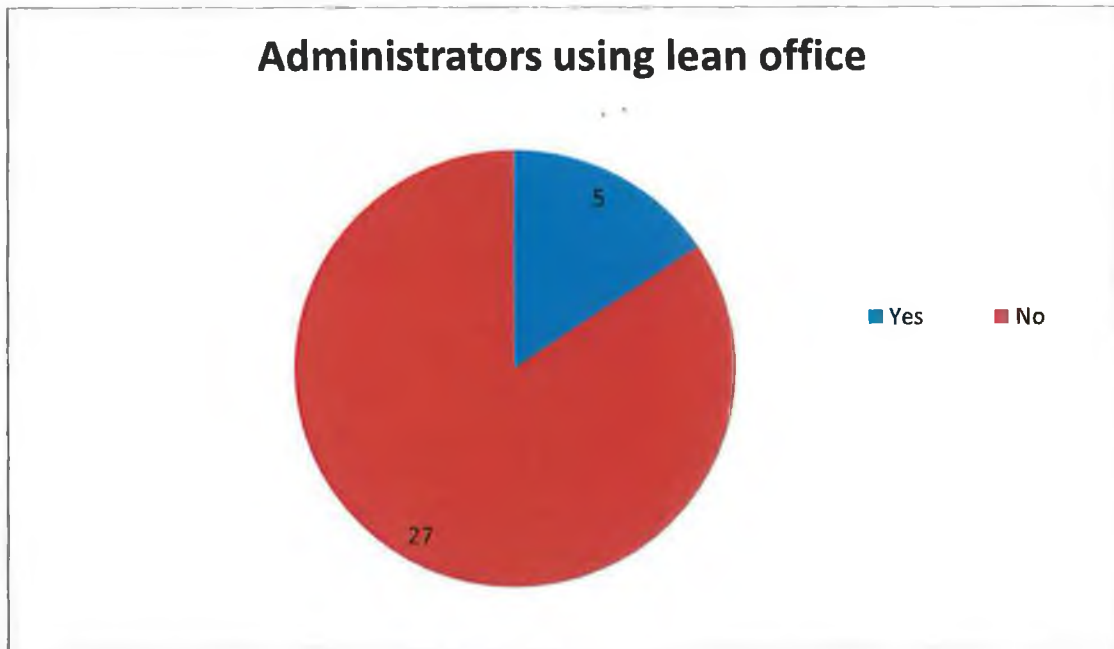


Figure E



Following on from the responses to part A of question three, the second part of question three indicated that of the twenty-nine respondents who stated in question 3 that lean office was practised in their office, eight worked in companies where value stream mapping was practised, while twenty-six others worked in companies where 5S or a clean desk policy was used. Four companies practised both. All of these companies had 50 or more employees.

Figure F

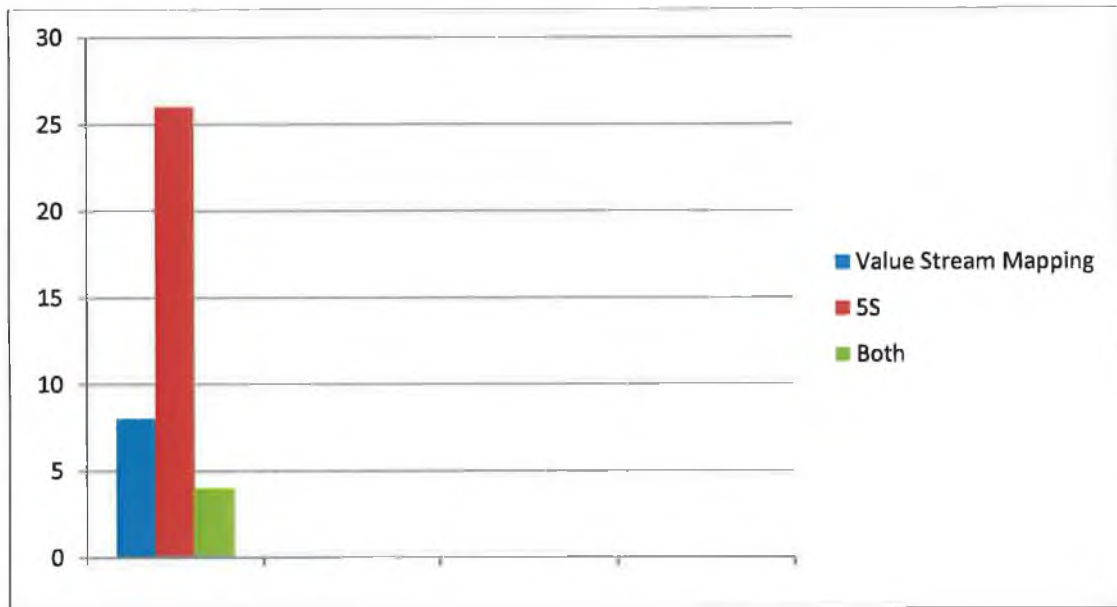


Figure G

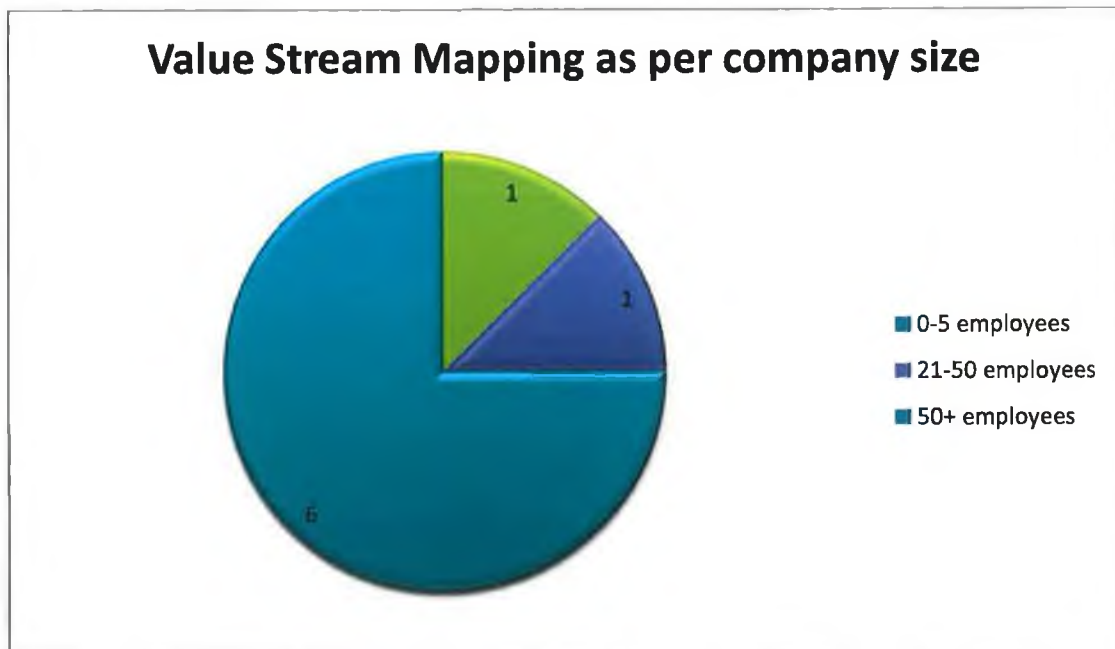
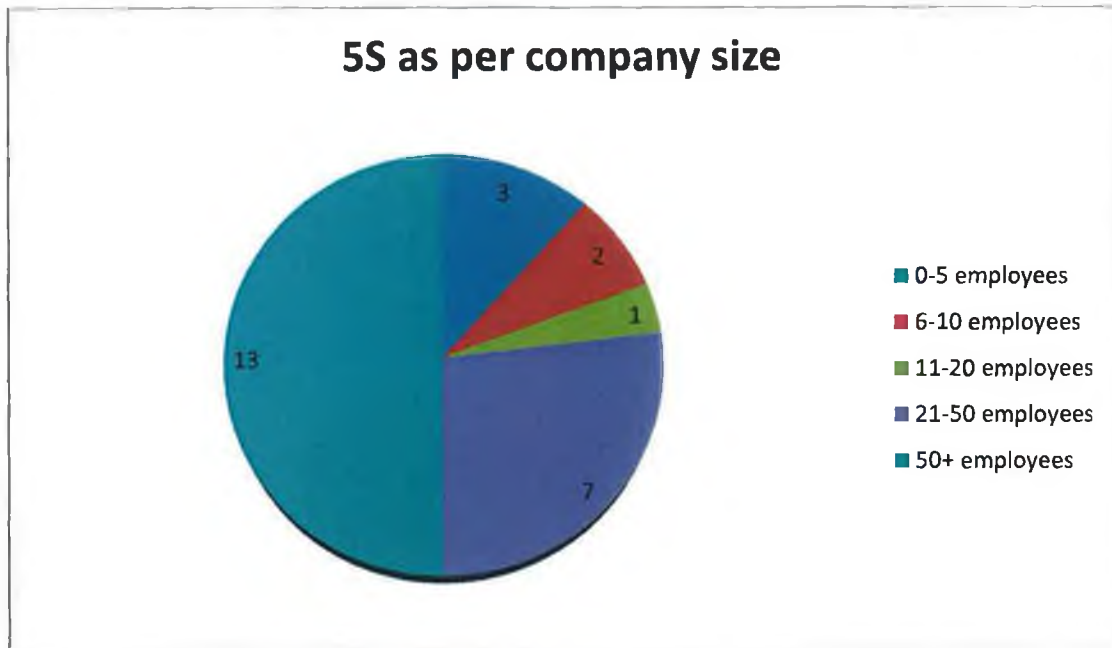


Figure H



These findings correspond with the findings of Douglas (2002) who stated that in the West 5S is sometimes disregarded or at least underutilized. In the article *Value Stream Mapping Non-Manufacturing Processes*, value stream mapping is most appropriate in a situation where the work performed in the office is complementary to that performed in the company's manufacturing area. Value Stream Mapping can be applicable in a wide range of areas but its use is likely to be far more common in areas where manufacturing and office activities operate as a unit in an attempt to ensure greater responsiveness to the need of customers.

Sarkar (2006) believes 5S radically improves the retrieval time of documents and reduces turnaround time to serve customers and address questions. 5S allows anyone to distinguish between normal and abnormal conditions at a glance. It is the foundation of continuous improvement, zero faults, cost reduction, and a safe work area. It is a systematic way to improve the workplace, processes and products through production line employee involvement.

Question 4

Figure I



Figure J



Figure K

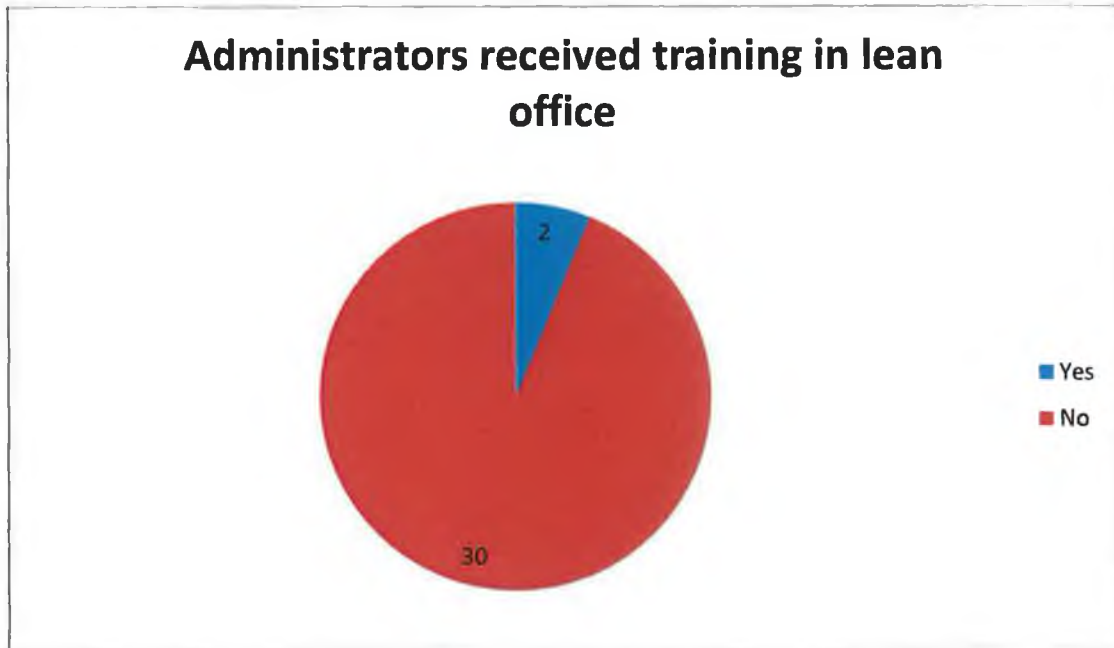
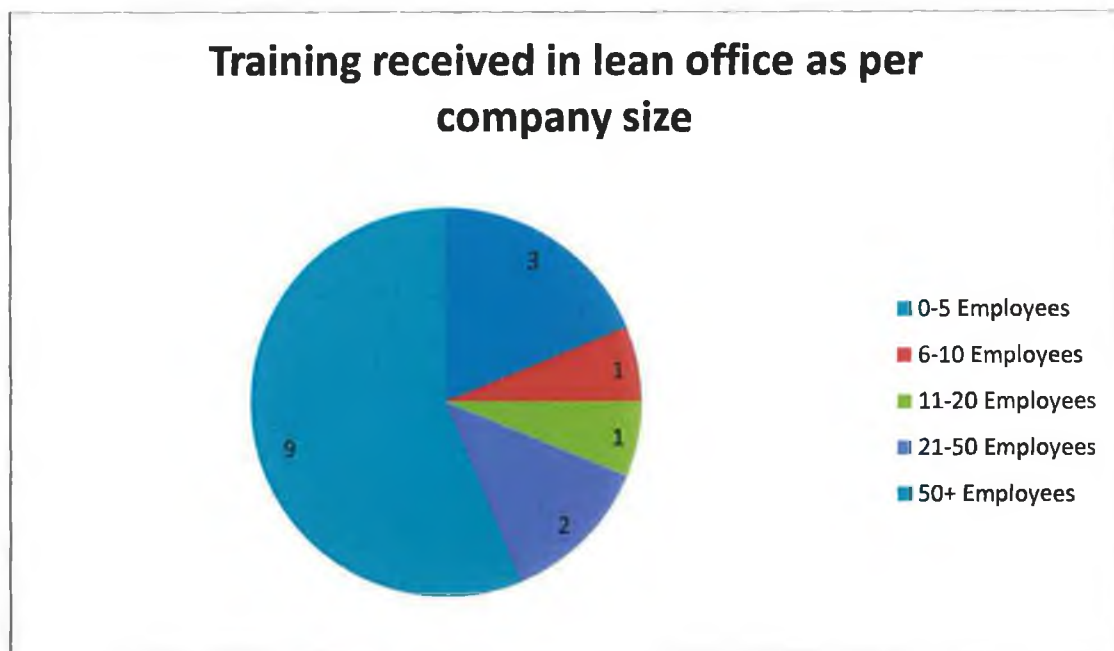


Figure L

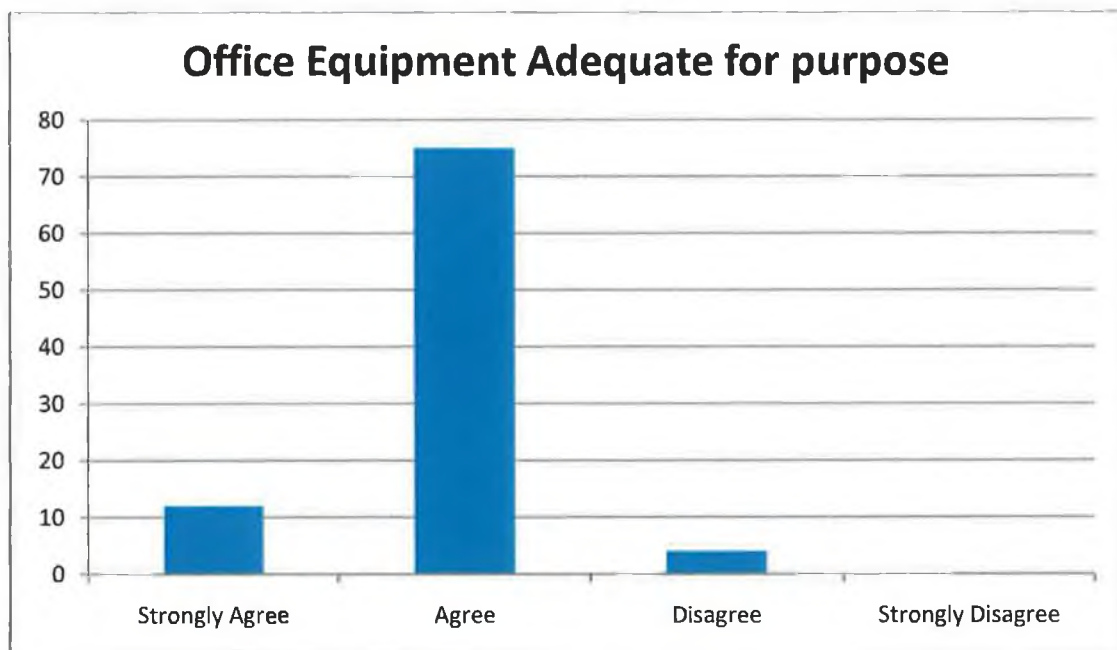


This information must be weighed relative to the number of respondents from each category listed in question two.

Having determined the degree to which the lean office was prevalent in the respondents' companies, the survey next asked whether training had been received in the area of lean office. Of the 91 who responded only 16 had received training in this area. Of the 16 respondents who received training in lean office, 8 had received training online, 3 had been introduced to the concept via basic concepts of 5S and practical examples, 1 via lean business processes, one manager who responded to the survey has received two black-belts while all his employees had received training in 5S, another manager who responded to the questionnaire had received greenbelt training while his employees had received basic training in 5S. Two respondents stated they had received training in the area of lean office yet failed to state what this training consisted of. These results suggest a wide disparity in terms of the use of and knowledge of lean office concepts. Where training has been received, some have received as little as one hour of online training.

Question 5

Figure M



Question five posed the question to participants as to whether they felt that their office equipment was adequate for its purpose. As Technology continues to improve and the demand for offices to be quicker and more responsive to the needs of their customers increases, it is essential that office employees have the right equipment available to them.

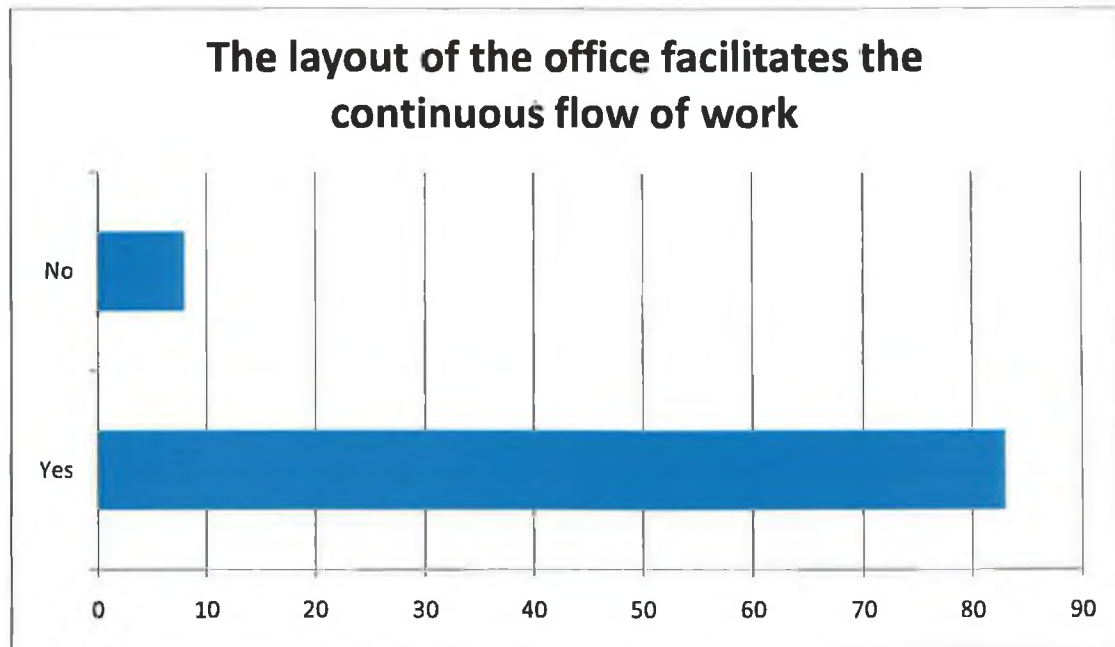
Of those who responded, only 4 stated that office equipment was inadequate. Some issues identified by respondents relating to areas which could do with improvement were an outdated air conditioning system, the need for more and better quality printers to prevent backlogs arising. was identified by two respondents, lack of space within which to use the equipment was a concern of one respondent, another respondent highlighted the need to make greater use of the equipment in their company by engaging in a lot more electronic filing in order to reduce the amount of printing being carried out. However, the vast majority agreed that office equipment was adequate with 13.2 % of respondents strongly agreeing with the statement as documented below.

When the adequacy of office equipment was examined in the context of company size there was very little difference with all categories showing a majority of respondents in agreement. The highest percentage of those who strongly agreed that office equipment was adequate for its purpose was in the 0-5 employee category.

The provision of adequate office equipment is fundamental for every organisation. As Whitehead (2001) states, companies that attempt to restrict or disregard, the deluge of technology will be unable to reap the rewards that come from sharing of information, and merging of office activities. Office information technology (IT) equipment such as faxes, printers, copiers and scanners are moving away from their traditional "stand-alone" roles and towards functioning like a team, linked together by the power of the modern computer network and the information sharing capabilities of the Internet. Shuman and Scott (2002) point towards many office buildings being not really designed at all, but simply "laid out" based on window mullions, workstation modules, and the idea of squeezing a particular number of bodies in a space.

Question 6

Figure N



In keeping with the responses obtained in question five, 91.2% believed the layout of the office equipment facilitated the continuous flow of work. When the researcher looked at the replies in the context of company size the greatest percentage of negative responses were in the 0-5 category (36%) by contrast with 14% in the 50+. No negative responses were given in the other three categories.

The need for greater storage space within which folders could be held was an issue which was brought up by two respondents as an area within which improvements could be made with regard to improving the continuous flow of work. Others cited the re-arrangement of equipment closer to the workstation and the clearing out of clutter as potential improvements which could improve efficiency. Another issue cited related to the occasional unavailability of office supplies such as stationery which could hinder the continuous flow of work.

Shuman and Scott (2002) posit, there is a strong belief that there exists a direct relationship between the success of a business, and the design of the workplace. Hassanain (2006) stated that there is a need to consider the concept of designing sustainable, flexible workplaces to quickly and effectively accommodate various future changes demanded by corporate clients, and to meet the emergence of new technologies and the increase in business competition.

Question 7

Creating a safe working environment is an essential prerequisite of creating an efficient and responsive office. In order to achieve the desired level of productivity workers must feel confident in the safety of the environment in which they operate.

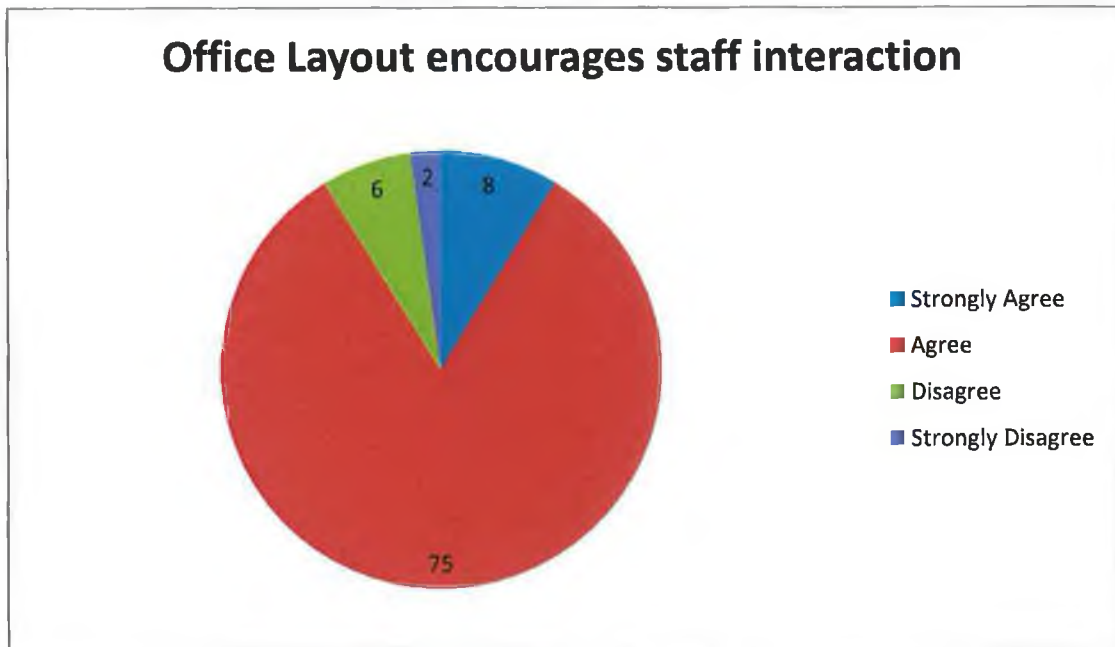
Respondents to the questionnaire also strongly believed that office equipment was arranged to create a safe working environment with 86.8% agreeing with the statement and 12.1% strongly agreeing.

Only one respondent strongly disagreeing with this statement who went on to suggest that issues such as cables sticking out and electrical cables/wires sticking out from the wall as major issues to be addressed with regard to ensuring safety in the work environment, another respondent was happy with the safety of the working environment in general, but went on to suggest that the monitor of the Personal Computer was not easy to adjust to the correct height to prevent neck strain.

When the researcher examined the answers in the context of company size there was very little variation between the categories. There was a slightly higher percentage who strongly agreed with the statement in the 0-5 employee category.

Question 8

Figure O



Of the questionnaires respondents, 75 agreed that the office layout encouraged staff interaction, 8 strongly agreed with this statement in relation to their business while only 6 disagreed with 2 strongly disagreeing.

In terms of potential improvements, one respondent stated that in their office there were 5 foot office separators which can be helpful with regard to noise diffusion but discourage interaction. Two other responses were similar and suggested removing partitions and bringing the desks closer together. Another two respondents suggested that similar functions should work in close proximity to each other. One respondent suggested that their company had got it right with a block of six offices being about right in achieving the proper balance between allowing privacy and interaction.

When the researcher examined the answers in the context of company size there was very little variation between the categories. In the 0-5 employee category 21% disagreed with the

statement. 15% disagreed with the statement in the 50+ category. No respondent in the other categories disagreed.

The layout of the office is regarded by many as an integral feature in encouraging staff interaction. Haynes and Price (2004), state that the output of the modern office is dependent on the human relations and the quality of the interactions undertaken in the office environment. If we accept the modern trend of organizations encouraging informal communication and abandonment of complicated formal channels of communications, most organizations will call for decentralization and simplicity of work transactions. This decentralization will lead to more participation (Saval, 2008). Richmond (2000) calls for maximum layout flexibility to encourage interaction.

Question 9

Figure P

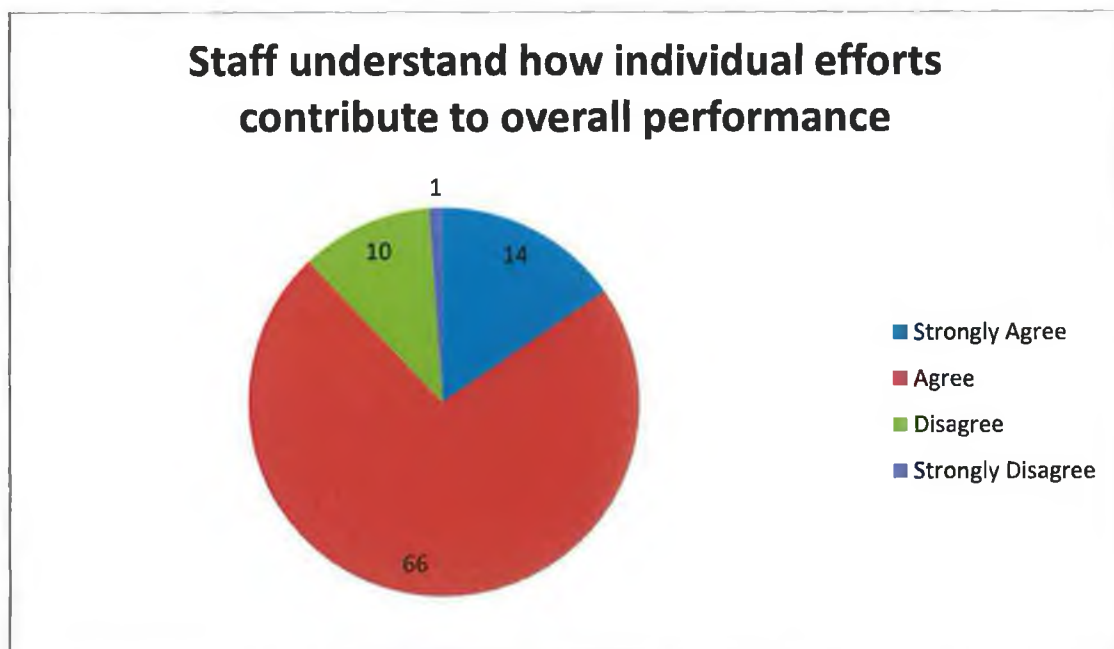


Figure Q

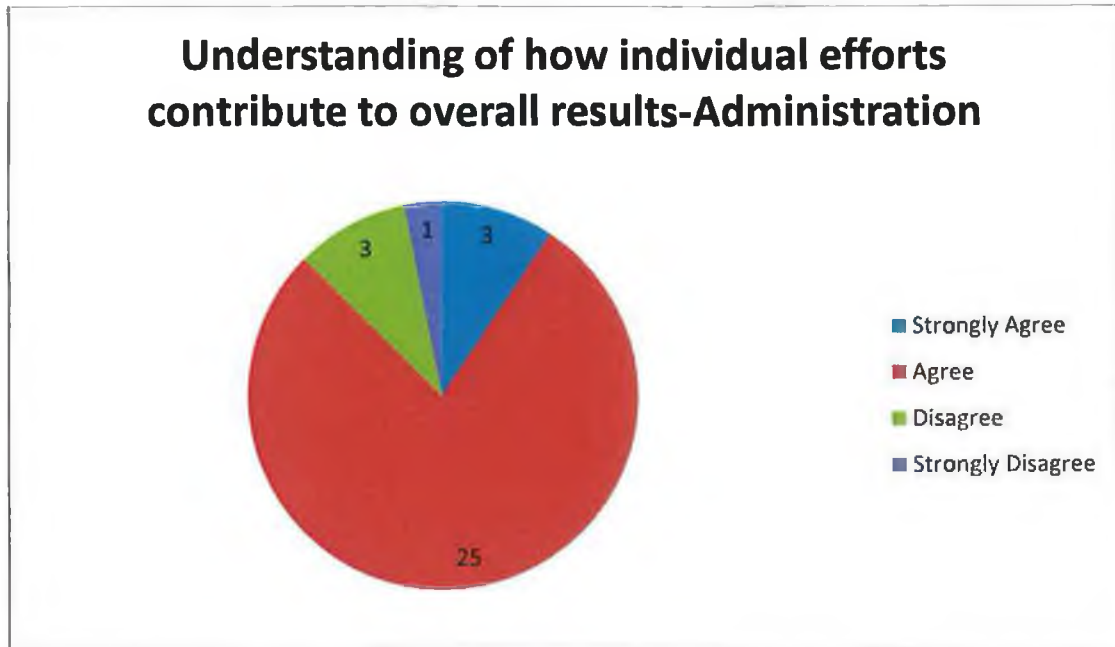


Figure R

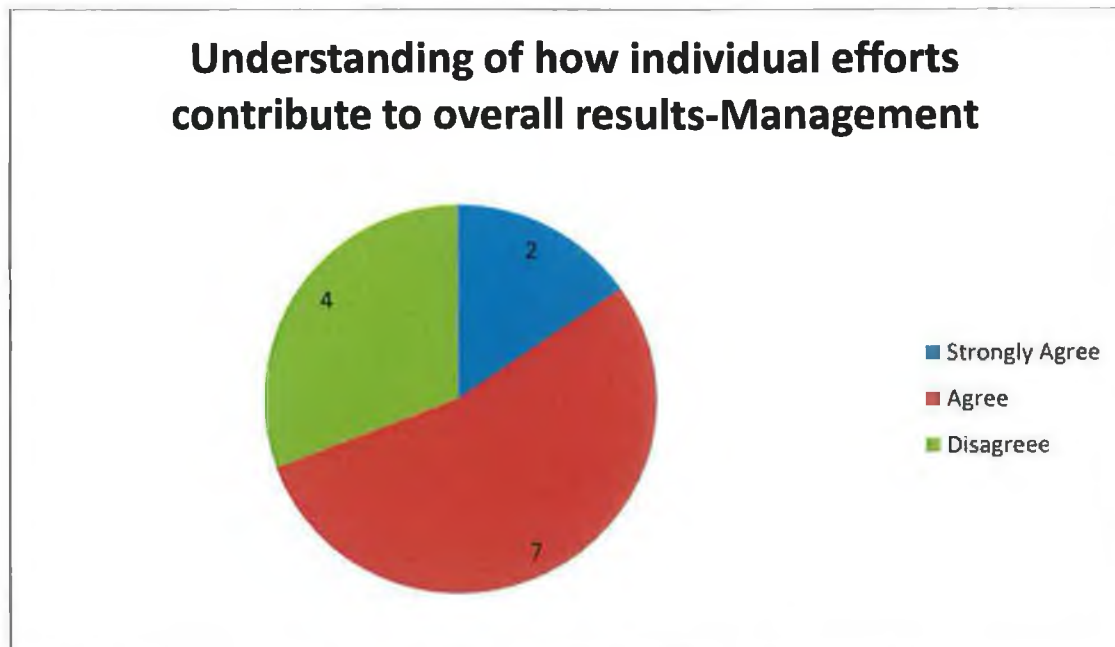


Figure S

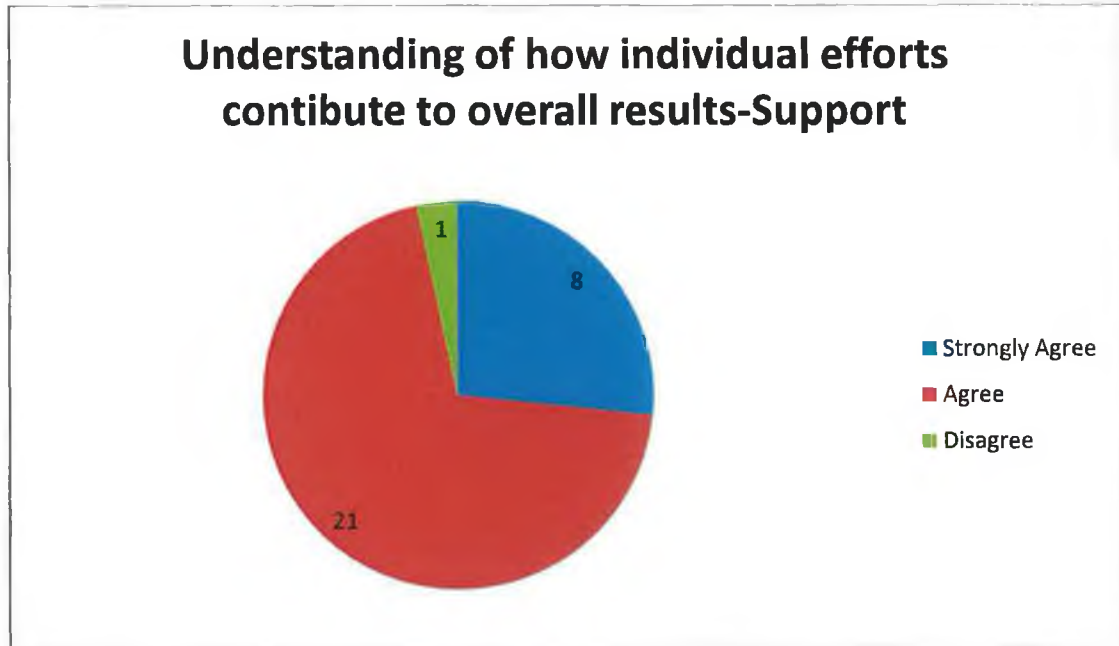
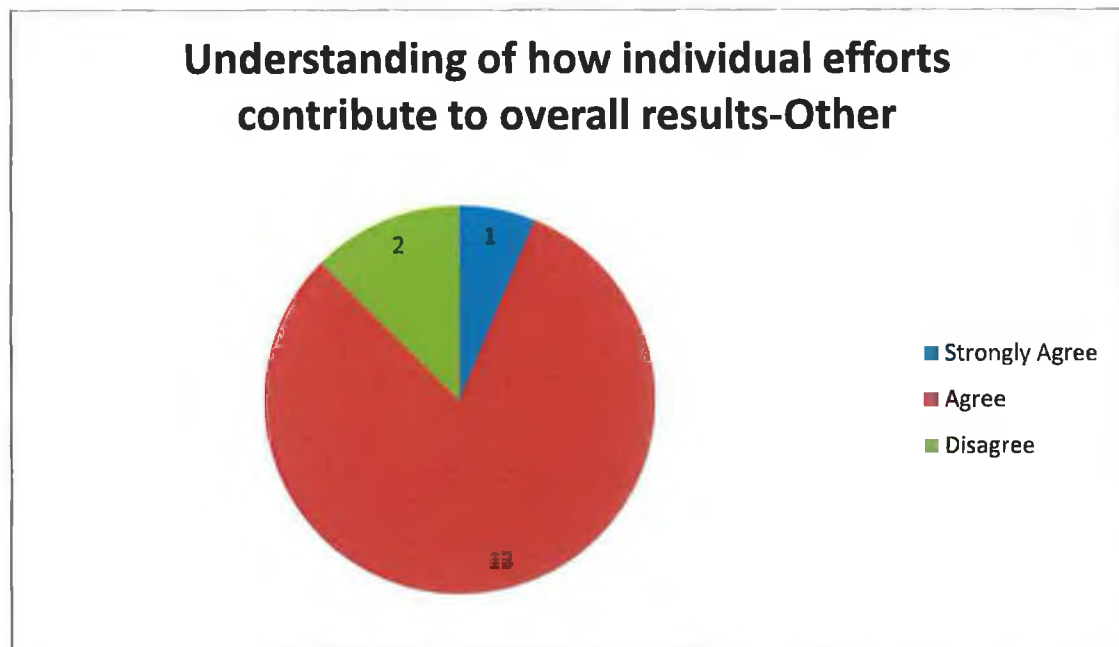


Figure T



When asked if they felt employees understood how their individual efforts contributed to the company's overall performance, 10 respondents believed this statement was untrue with regard to their organisation; one respondent strongly disagreed with this sentiment, while 66

agreed and 14 strongly agreed that employees understood how their efforts contributed to the company's overall performance.

When the researcher compared the responses to the question in the context of company size, the greatest number of those who strongly agreed was in the 0-5 category- 36% as compared to 19% in the 50+ category.

In the article "*Making HR Count*" it is suggested that a company must create some kind of emotional link with its employees in order to generate and sustain more practical levels of loyalty, retention and performance. To paraphrase, an employee who is "engaged" demonstrates positive traits in the following categories:

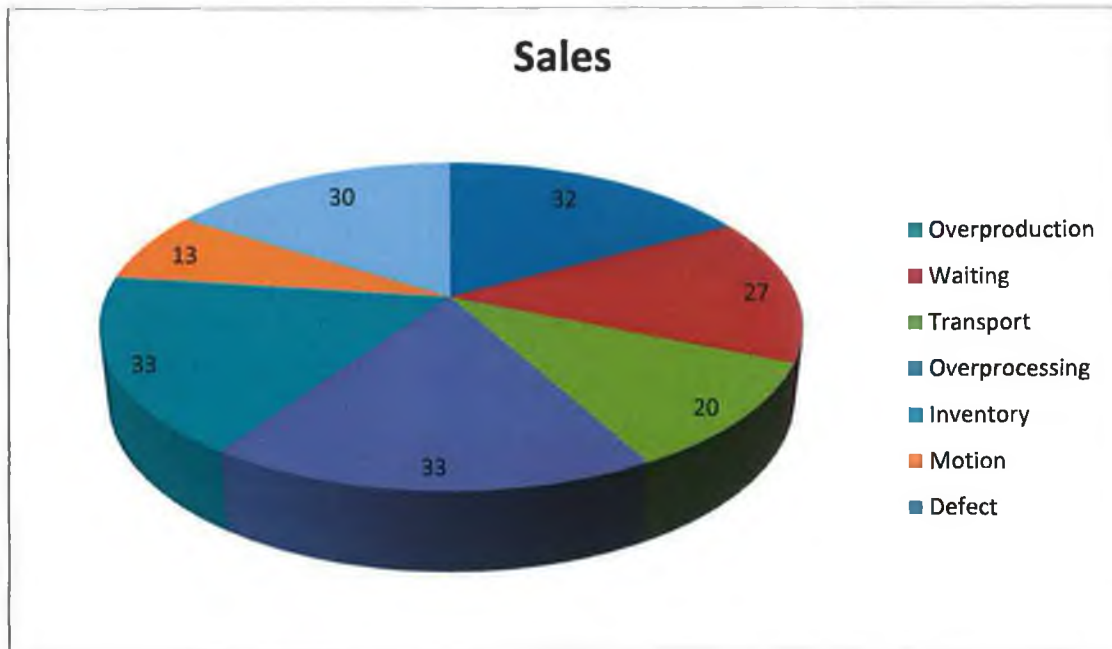
- retention (a desire to stay with the organization);
- effort (a desire to provide more than is absolutely required);
- advocacy (the voluntary promotion of the company as a good place to work);
- passion (a positive emotional connection to the company).

As Woodford and Maes (2002) suggest many multi-national organisations are now viewing employees as key to their global success.

As Schulman (2007) states, both employer and employee have an active role to play in cultivating engagement. Mutual understanding of context, expectations, and motivations is an essential first step, ever more necessary when there is a generational divide.

Question 9(B)

Figure U



In attempting to eliminate waste it is essential to first of all identify the waste which is occurring. Chaneski (2005) states that the same wastes that are found on factory floors, such as overproduction, waiting, excess motion, frequent transportation and underutilized people, are showing up in office processes.

With regard to the identification of waste in the office under the seven main headings of waste: overproduction, waiting, transport, over-processing, inventory, motion and defect, the responses indicated that over-processing, inventory and overproduction were the main wastes which respondents encountered in their business.

Over-processing waste was identified by 33 respondents as a problem. Issues identified by respondents included: Printing twice just in case used as a motto (3), student handouts (1), photocopying material which exists in electronic format (4), unnecessary extra copies (10), (One respondent suggested a reason for the unnecessary extra copies as resulting from the preference of staff to read reports and research on paper as opposed to reading from monitors despite all emails carrying the following message "Please consider the environment - do you really need to print this email?"), expense reporting (1), excess time spent on certain unnecessary tasks (1), wage slips (1), too many personnel involved in signoffs (5), unused

reports (2), redundant review loops (1). Four respondents identified over-processing waste as an issue but failed to provide a specific example.

Inventory waste was also identified by 33 respondents as an issue. Issues which arose included: respondents stating that their company recognised inventory waste but attempted to balance this need with the ability to meet demand at all times (5), too much stationery purchased at once (2), unread/excessive e-mails (5), unseen obsolescence (1), stationery (4), paper files (2), excessive CD's (1), excessive DVD's (1), excessive paper manuals or books (1), unnecessary ordering where old equipment can be used (1), unnecessary lamination of paper (1), excessive printing (1), excess photocopying (1). Seven respondent identified inventory waste as an issue but failed to provide a specific example.

Respondents identified overproduction in 32 instances as being a waste issue. Excessive printing (5), excessive paper use (11), excessive photocopying and use of ink (4), printing on single side of page (1), duplicated CD's (1), printing hard copies of electronic documents (1), excessive training requirements (1), printing of wage slips (1), printing of marketing materials (1), employees ordering parts which will never be used (1), duplication of work and projects worked on that are never needed (1). 4 respondents identified overproduction as an issue but failed to specify a particular example of overproduction. According to Kobayashi (1995) overproduction is regarded as the most serious waste as it gives rise to other types of waste.

Defect waste was identified by 30 respondents. Responses included customer complaints (1), computer equipment (1), photocopiers/printers (5), copier not able to copy more than 50 at a time (1), reject CD's/DVD's (1), in-house duplication process (1), laminating paper (1), printer not suited to printing wage slips often requires duplication (1), errors in documentation/incomplete documentation (8), print ribbon not adequate for printing (1), updating software leading to problems (1), 1 respondent cited a high level of data entry as a problem but added that improvements in electronic processes recently have resulted in less errors occurring. Seven respondents identified defect waste as an issue but failed to provide specific examples.

Waiting waste was identified by 27 respondents. Slow systems (1), slow computers (3), slow printer (1), waiting on files from storage (1), CPU intensive processes take longer than necessary (1), time lost waiting for approvals (7), system downtime (3), computer files (1), waiting for files (2), waiting print of wage slips (1), bad meeting practise (2), waiting on photocopying (1).

Transport waste was identified by 20 respondents. Issues identified by respondents included, Going to line leader/manager for signoff (4), walking to next room for printer (2), transporting documents to and from multiple locations (3), going to line leaders for signoff (1), transporting stationery (1), movement of student work and examination material (1), having to print out all emails and documents (3), excessive e-mail attachments (2). Three respondents identified transport waste as an issue but failed to provide a specific example.

Motion waste was identified by 13 respondents. The issues identified by respondents included: excessive walking (6), printer/laminator at end of corridor/factory (3), four respondents identified motion waste as an issue yet failed to provide a specific example.

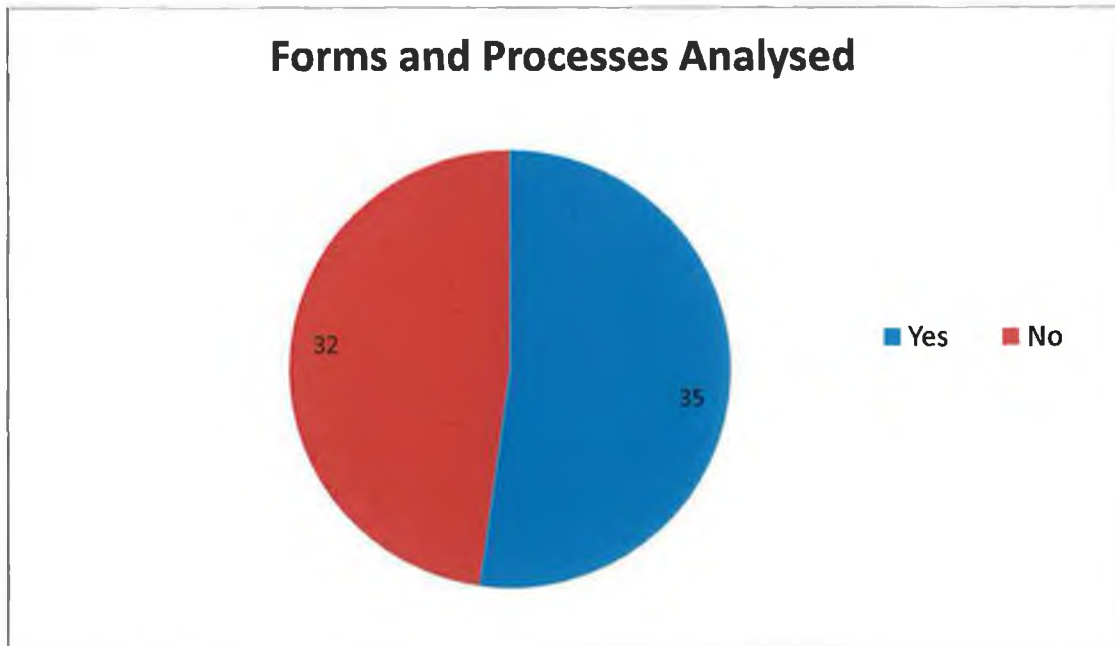
ValueStreamGuru.com describes how even though the seven wastes originally related to the manufacturing environment; they are equally applicable in the office environment. The article provides examples of the wastes that can occur under the seven headings and suggests some solutions:

- Transport – for example consider the movement of paperwork between employees. Minimize the amount of movement by arranging processes by person and keep things electronic whenever possible.
- Inventory – Too little inventory can lose sales, too much inventory can hide problems. Aim for a “Just in Time” (JIT) stock by maximising your Lean Office techniques to report on sales par levels and then base any stock re-order levels on correct and up to date information.
- Motion – Remove unnecessary motion from the office operations and improve the flow of the workplace. For example – conduct spaghetti diagram reviews – where do you place your office machinery – where do your workers move – optimize where possible

- **Waiting** – Minimise the customer waiting time and maximise “value add” time. Aim for a smooth flow with Lean Office Principles. For example consider again the invoice process – does your process have excess lead time as your documents wait for authorization?
- **Overproduction** – An obvious waste, always aim to meet exactly what the customer expects, just in time, to the correct quality standard. A common example is multiple versions of the same document – one to be posted, one for file, one for accounts etc – can this be minimized?
- **Over Processing** – Within an office environment, identify unnecessary steps within a process and ensure that basic administration tasks are not inefficient
- **Defects** – Reducing the number of processing mistakes will not only increase customer satisfaction but will also reduce picking errors and customer returns. There is no reason to have any processing errors.

Question 10

Figure V



When asked whether forms and processes had been analysed to identify opportunities to eliminate waste, 52.2% of respondents stated that forms and processes had been identified with the view to identifying opportunities to eliminate waste, whereas 47.8% replied that forms and processes hadn't yet been examined as a means of identifying future opportunities.

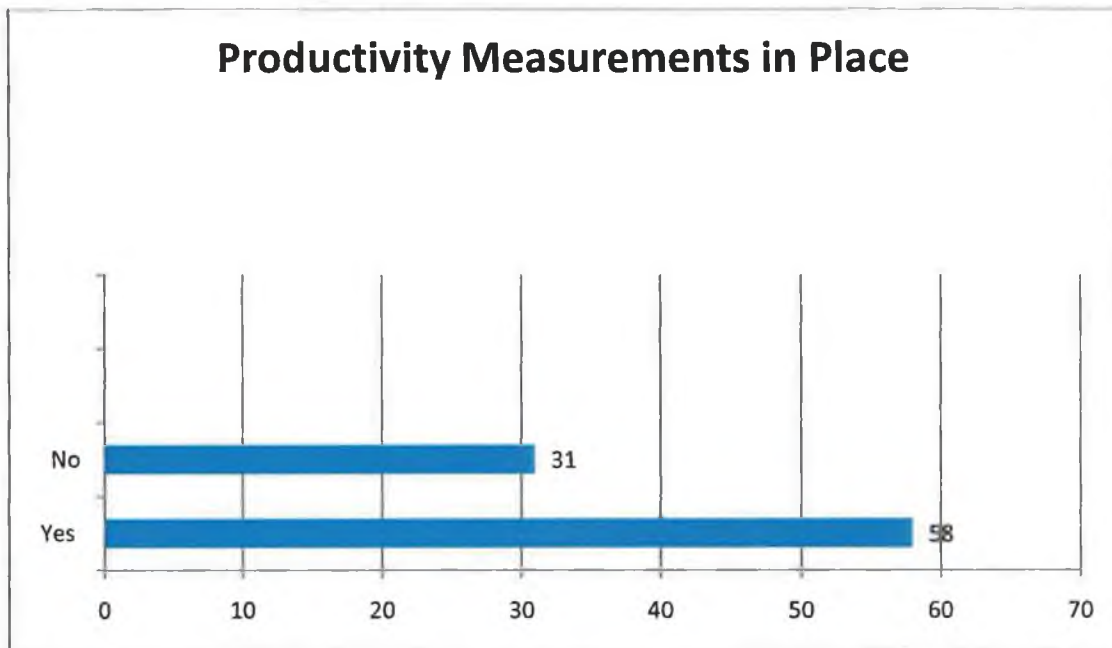
When the researcher looked at the respondents answers in the context of office size, the companies of 50+ employees had the highest percentage of positive answers at 63%.

The elimination of unnecessary forms and processes is a crucial element with regard to achieving competitive advantage. In particular, the ability of insurance companies to generate quotes for customers over the phone rather than requiring the customer to fill in a form has saved time and money for both parties. AXA are an example of a company who achieved this successfully.

As the study of a quotation process by Buzby et al (2002) illustrated there is often opportunities to eliminate non-value adding processes. They found that by using electronic solutions, it would be possible to eliminate two of eight tasks involved in the overall process, namely "type up customer copy" and "proofreading customer copy". In the new process, all of the information included in the cost estimating step is automatically formatted into a finished quote report using a programmed function built into the ERP system. In this way, any member of the quote team can generate and send a report back to the customer as soon as all costs are completed. Because the report is automated, very little preparation time is required and the double data entry that occurs in the present process is eliminated.

Question 11

Figure W



In the responses, 58 of the 89 respondents said that productivity measurements were in place. The measurements cited by respondents included: Daily and hourly targets are set for each production line (3). The Performance Board outlines and monitors performance; targets are given and monitored on daily, weekly, monthly and annual basis (4). Metrics are set at a corporate level (1). Measurements constantly change to ensure continuous improvement Performance is measured based on the cost of producing a CD/DVD (1). Performance is measured based on machine capacity, labour cost, capital cost and overhead cost (1). Detailed timesheets are matched to client billing (5). Measurements related to quality inventory and delivery is based on KPI's per department (9). There is continual improvement and centralisation of activities (1). Productivity is assessed based on the number of customer who renews their policies (4). Productivity is measured by the reduction in defective units (4). Productivity is measured based on a reduction in customers complaints (1), by keeping within budget (4) and by inventory control (1), waste control (1), weekly/monthly units shipped (1), accurate forecasts (1), sales orders fulfilled (1), capacity planning (1), inventory control (1), , ship v planned production (1), finished goods (1). Goals are assigned at the start of the year or at the start of the project and monitored throughout (2). In a sales based role employees are required to keep a record of sales and are required to fulfil sales targets (2) and

measurements are based on target figures for new business (1). Six respondents stated productivity measurements were in place but didn't specify. These results show the wide variety of measurements in place throughout different companies.

When the researcher looked at the extent to which productivity is measured in the context of office size the office of 50+ had the greatest percentage of positive replies at 90%. In the 0-5 category the percentage of positive responses was 42%.

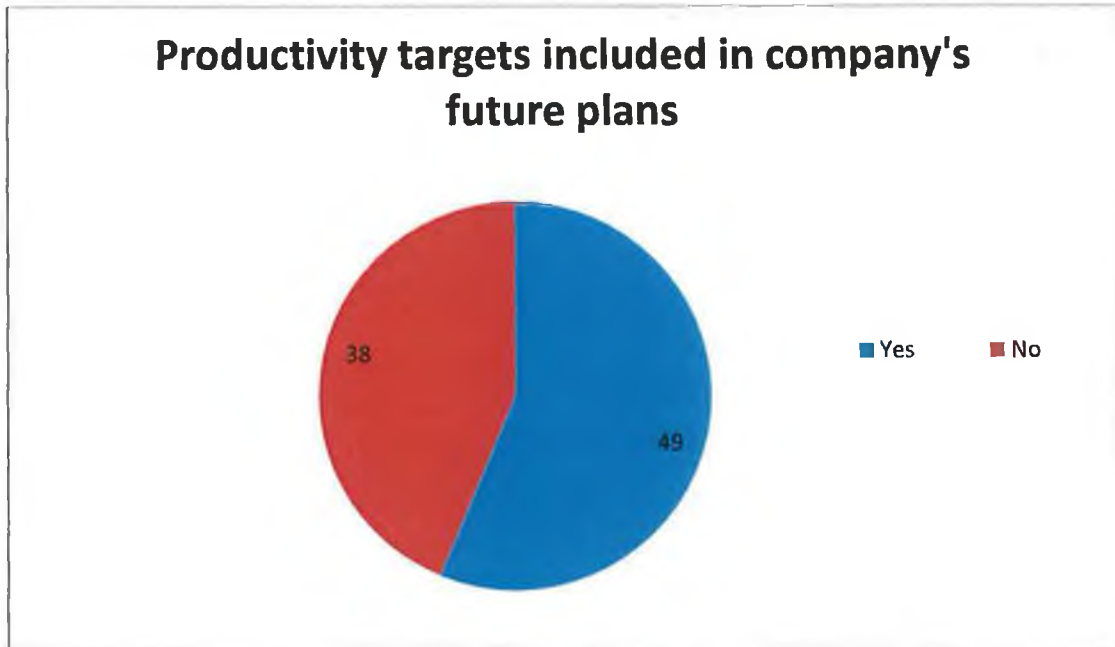
With regard to productivity, Rao & Miller (2004) view productivity metrics as ratios of outputs and inputs. Outputs are revenues or other sources of income which may be adjusted based on exchange rates, whereas inputs are labour, materials and similar expenses or resources that are used to support sales activities. Organisations having strategically aligned and well-managed operations including all supporting activities should have higher productivity ratios than non-aligned or poorly managed organisations.

As Haynes (2005) states, there is no uniformly accepted way of measuring productivity, by definition the range of studies claiming to have measured productivity are going to present contrasting results. Hoehn (2003) pointed out that one of the serious weaknesses relating to productivity measurement include a lack of knowledge on when to measure.

As Steiner (2008) states, the practical knowledge of knowing what-to-measure, where-to-measure, how-to-measure, and when-to-measure is critical as manufacturers and service providers constantly face transformations in their business environment.

Question 11(B)

Figure X



The second part of question 11 found that in the case of 49 of the 87 who responded, productivity targets were included in the company's' future plans.

When the researcher looked at the productivity targets in the context of company size, he found that in the companies of 50+ employees 73% gave a positive response. In all the other categories the average was 45% of positive replies.

Question 12

Figure Y



Figure Z



63 of the 85 who responded to the question on quality standards stated that their company had obtained a quality standard with many companies having obtained more than one quality standard. ISO 9000 was the most popular mark obtained with 38 respondents stating their company had obtained the ISO quality certificate, 25 had ISO 9001-2008 certification, 19 had ISO 14001 certification, while 5 had matrix certification (3 of which were managers) with 5 responses indicating other standards, 1 for ISO 2700, 1 for chartered accountants, 2 for FDA certification and one for CHKS accreditation.

When looked at relative to company size, the researcher found that ISO 9001-2008 was the most popular in the 0-5 category. In all other categories ISO 9000 was the most popular. Almost equally popular in the 50+ category was ISO 14001.

Comments as to why the company had received no official standard were as follows:

'Don't know why company has not received quality certification. It's probably not that important for non-production offices. (Manager)

'Start up company' (Manager)

'Have not applied for same' (Administration)

'Management does not focus on that aspect of business' (Administration)

'Never considered to be a vital requirement' (Other)

'Do not believe ISO standards applied for' (Support)

Stevenson and Barnes (2001) in commenting about ISO 9000 stated that it was based on good intentions, but that there were problems with the standard such as:

- The fact that the standard creates unnecessary paper work is unquestionable;
- The four main areas of cost (time, training, consultants, and registration) may never actually be recouped;
- The standard may interfere with new and better ways of operating; and
- The standard is too general and not industry-specific.

From the information gathered from the questionnaire it is apparent that the majority of companies are unfamiliar with lean office.

Additional comments

'Our company is currently implementing 5S training. Hope to see improvement when implemented' (Support).

'There is always room for continuous improvement on a daily basis. Employer and employee involvement imperative to implementing change within company' (Support)

'I have completed green-belt training and feel lean tools are a great way in improving official manufacturing areas. Our company is at the beginning of the lean journey and are looking forward to the change. (Manager)

Conclusion

The question addressed in this research was the degree to which office environments were operating effectively and whether improved efficiency could be derived by using the tool of lean office. The general conclusion the researcher came to was that lean office practices would be of benefit if implemented in the companies of respondents.

Manufacturing costs are constantly viewed with the objective of determining where cost and time savings can be made, but somewhat less attention has been given to achieving greater efficiencies in the office. From the information gathered in the primary research it is clear that only a minority of the enterprises (less than one-third) surveyed practise lean office, leading the researcher to conclude that the concept has yet to find universal acceptance. This is in line with research conducted by Baker (2002) and O'Corrbui and Corboy (1999) documented in Bhasin and Burcher (2006).

Thomas (2009) states that the lean concept hasn't gained widespread acceptance in the office due to a number of misconceptions. These include: 1) Lean is for the factory and can't be applied/adapted to the office. 2) Lean will require me to work faster and harder. 3) Lean office is just a management fad. 4) The language of lean is so different it will be problematic applying it. The scope of the research didn't extend to an investigation into the reasons why lean office was overlooked as a means of gaining competitive advantage.

From the responses, the researcher further concluded that the concept of lean office has had lower rates of penetration in certain sectors i.e. in the administrative sector while it is considerably higher in the management sector. In addition, he concluded that within this management sector there is greater penetration of the philosophy of lean among managers in offices of 21+ employees.

International research shows that the philosophy of lean appeals more to the managerial sector. Research by Emiliani and Stec (2005) outline the reasons why senior managers have become interested in adopting lean principles and practises. They believe that it results in many benefits. Among these are higher quality products and services, increased market share, margin expansion, revenue growth, higher productivity. Better customer focus, faster response to changing market conditions and higher asset efficiency. In the question on job category the questionnaire did not differentiate between manager and senior manager, but the

researcher concluded that larger enterprises will have more senior managers who are more likely to have been exposed to the philosophy of the lean office.

The secondary research showed a low penetration rate for the lean philosophy in offices. Womack and Jones (1996) outline some of the reasons. Lean thinking is often associated with employing fewer people if the organisation is in a poor financial state, when some employees will have to “man the lifeboats” (Womack and Jones, 1996, p. 258). Also, some managers were described as “anchor dragging”; not willing to accept new ways of thinking even when there was need to “take action quickly”. One of the disadvantages with lean is that the effect to the bottom-line often isn’t immediately realized and can create some concern within management about its utility in the short run.

The secondary research led the researcher to conclude that lean produces a long-term cultural change within the organization. The limited scale of the primary research did not allow for question on positive/negative attitudes to lean but international experience would suggest that the implementation of a lean philosophy is not always welcomed. Thompson (1997) states that when supervisors call on their staff to become more lean and competitive workers inevitably see that as resulting in more work with fewer people performing the work. Lean then becomes a euphemism for understaffed and overworked.

In addition the secondary research indicated that lean office practices may not always work out as expected. Hamel (2000, p. 2) suggests a reason why many companies fail to embrace the lean philosophy. He states that in a review of fifty companies, including some notable Fortune 500 companies such as Kodak and Unisys, forty-three suffered a significant downturn in earnings after three years of implementing lean.

When the researchers looks at the low level of exposure to the lean philosophy among most of the respondents by contrast with the relatively high level among the managerial sector, the researcher concludes that there is not yet an effective programme in place to allow the dissemination of the knowledge from management to the general workforce.

Given the limited nature of the questionnaire the researcher could not reach a conclusion as to why the managerial knowledge of lean had not filtered down through the system but notes from reading the literature on lean that it is considerably more difficult for managers to implement lean in an office environment as opposed to a manufacturing environment.

There is considerable evidence that as Womack (1990) states lean is still closely related to manufacturing. In the primary research where the respondents are asked for additional comments, several answers related to this association of lean with manufacturing as opposed to office. The researcher concludes linking of lean to manufacturing is not uncommon among office workers.

The low level of penetration of Value Stream Mapping and 5S among the enterprises led the researcher to conclude that the internationally recognised tools for implementing lean office practices have not yet gained widespread support.

In keeping with the answers received in question three, it was not surprising that the answers to question four suggested that fewer in one in five of the respondents had received training in lean office. From this data the researcher concludes that part of the reason why penetration rates have been so low is that training has not been widely available. In addition, the researcher concludes that where training has been received, it has often been inadequate: it has in many cases been at a very basic level which is unlikely to provide a foundation for the implementation of lean philosophy as a whole.

In Question 5 regarding the adequacy of office equipment the high level of satisfaction among respondents leads the researcher to conclude that in general the office equipment is suitable for purpose. Equally in the responses to question 6 the high level of satisfaction with the layout of office equipment leads the researcher to conclude that for the vast majority of respondents this layout does facilitate the continuous flow of work.

The researcher concluded that office equipment is arranged to create a safe working environment because the level of dissatisfaction was statistically negligible.

The level of agreement as to how office layout encouraged staff interaction was not as unanimously supported. Nevertheless, a large majority of respondents agreed or strongly agreed that office layout did encourage staff interaction and the researcher concluded that in the enterprises surveyed office layout encouraged staff interaction.

In the replies to question 9 on employees' understanding of how their individual efforts contributed to the overall result, the majority understood the significance of their contribution but a significant minority did not. In his reading of the secondary research on the philosophy

of lean the researcher noted the significance given to providing all employees with a positive understanding of the value of their role. For example, in their book *Lean Transformation* Henderson and Larco (1999 p.42) suggest that in a true lean enterprise workers from the top of the organization to the bottom know their role in the organisation. Each individual knows the role of the group they belong to. Employees aren't defined by their job title; all understand that their role is providing value to the end customer. Lean players appreciate that everyday tasks are absolutely necessary and must be executed with care and efficiency. They understand that the smallest tasks combine to create the whole. The researcher concludes that an understanding of how their efforts contribute to the overall performance would help this minority of employees improve their efficiency and therefore morale as they would have a clearer understanding of their role relative to the overall aims of the organisation.

A sizeable number of respondents didn't identify any waste or ticked the heading without identifying specific examples of waste under each heading. It is not clear to the researcher whether this was an inadequate understanding of the terminology or whether the respondents felt that there wasn't significant waste. However, given the detailed responses of those who identified waste the researcher concludes that there is a significant amount of waste under the seven main areas.

This is in line with the researcher's study of the matter of waste as detailed in secondary sources. The article *Lean and Fitter* (2008) refers to waste as identifying and removing unnecessary steps in organizational systems and processes that naturally evolve to become needlessly intricate. Without effective management of this waste, there is limited scope to improve the service provided to customers. The article states that removing waste through lean frees up additional capacity for growth without the need for extra capital investment or an increase in labour costs. Thompson (1997) states that waste 'poisons' the office environment and by eliminating waste it can in itself be useful in uncovering other waste.

From the primary research, the researcher concludes that the greatest waste is in the areas overproduction, over-processing and inventory but given the wide variety of examples given by respondents it is difficult to come to any conclusion on a primary source of waste within these broad categories.

The least amount of waste identified was motion waste. The researcher concludes that this is due to the favourable replies received from respondents on the efficiency of office layout.

The relatively low number who identified transport waste would also lead the researcher to conclude that efficient office layout limits waste under this category.

In the responses on identifying waste, some of the most detailed answers related to waiting waste. Frequent examples of this are waiting for manager sign-off. From this the researcher concludes that this was more of an irritant and affected people on a more personal level than the over-processing or overproduction wastes.

Regarding defect waste, the examples given were too diverse for the researcher to come to any conclusion with regards to a primary source of defect waste. However, he concluded that respondents were more exasperated by defects in the equipment that they used rather than defects in the end product.

There was not a substantial difference in the numbers who ticked yes and no for question ten which asked if forms and processes had been analysed to identify opportunities to eliminate waste. The researcher could not come to any conclusion as to whether this analysis hadn't been conducted or had been conducted without the knowledge of many respondents.

The majority of the respondents indicated that productivity was measured leading the researcher to conclude that in most enterprises productivity is considered very significant. However, a substantial minority ticked that productivity was not measured. The researcher was unable to conclude whether productivity wasn't measured or else was being measured but the fact hadn't been communicated.

The following question with regard to productivity targets in companies' future plans indicated that a majority were aware of such targets for the future but the smaller proportion of respondents who ticked yes by comparison to question 11(a) led the researcher to conclude that some companies have not included productivity targets in their future plans. There was also an increase in the number who ticked neither box leading the researcher to conclude that many employees have a lack of knowledge of their company's future plans.

A wide variety of measurements were used with regard to the measurement of productivity. The most common of these were Key Performance Indicators. However, given the broad range of measurements used the researcher concludes that productivity measurement instruments varied according to the company and the projects which they undertook.

In question twelve, the majority of respondents indicated that their company was in compliance with a national standard and had received certification outlining this. A large number of companies had achieved more than one quality standard. Therefore the researcher concludes that acquiring a national standard is a significant achievement. The researcher concluded that those companies who haven't obtained quality standards didn't regard it as essential in their line of work or that the adjustments needed to bring the company up to the level to acquire a quality standard were considered uneconomic.

Having read extensively through the literature on lean office and related topics and conducted primary research into the area of lean office, the researcher concludes that lean office, while far from a new concept is one that has yet to fully capture the imagination of the majority of office managers or staff. While most businesses are using varied methods to cut costs and achieve greater efficiency, it appears that the concept of lean is not yet seen as a viable solution. This may be due to a number of factors, the investigation of which was outside the scope of the research.

It is clear to the researcher from the secondary research conducted that the implementation of lean in any company is a complex matter. He concludes that its introduction would need a change of mindset on the part of all involved in an enterprise.

When assessing the relative importance of the various factors involved in implementing the lean philosophy, the researcher concluded that the elimination of waste was of prime importance. If possible the savings achieved from waste being eliminated could be used to add value adding features to the end product or service or else the savings could be passed on to the end customer. As Thompson (1997) states waste adds costs and reduces the quality of your products and services.

It is also clear to the researcher that the other most important factor was increasing communication at all levels of the organisation. It is clear from the research that many managers have been introduced to the lean philosophy but in all enterprises there needs to be a system put in place to pass on the information on lean to the employees to assist them in learning more about the concept and ultimately achieving greater efficiency in the process as a whole.

Recommendations

Company management should consider how best to introduce the lean philosophy in relation to maximising efficiency and productivity. A self-assessment, or help from lean consulting experts might be needed.

Management should not expect immediate results as the benefits of its introduction may not be seen in the short term. Management must keep rigidly focused on that vision and take actions consistent with their vision.

The management must consider how the future success of the company can be ensured by employing lean as a catalyst.

The management should review their lean strategy with stakeholders on an annual basis so that the company can adapt to changing demands and keep application relevant.

The vision must be clearly communicated with all employees at every level in the hierarchy.

Achieving the Objectives

Having conducted the research, the researcher established to what degree the original objectives of the research had been met.

The primary objective of this research was to investigate the factors that improve productivity in the office environment primarily through the means of the lean office. The researcher believes that this objective was satisfied through the primary and secondary research conducted. Prior to compiling the questionnaire for the primary research, the researcher read extensively the literature relating to the factors that create efficiencies in business and the concept of lean. Through the primary research, the questionnaire, the researcher investigated the prevalence of these factors in the companies or enterprises where the respondents worked. Questions included the practise of lean office techniques, the training in lean techniques, the physical layout of the office, the success or otherwise of this layout, how it promoted staff interaction, the question of waste and the measurement and monitoring of productivity. The answers gave a good overview of office efficiency in a variety of companies and enterprises in the West of Ireland.

The secondary objectives of the research involved conducting an analysis of the measures organisations were taking to increase productivity. Reading through the literature on office efficiency and the philosophy of lean in increasing productivity gave the researcher an understanding of the main measures that companies worldwide were taking to increase productivity and the benefits and efficiencies accruing from these measures. The primary research gave the researcher an understanding of the overall importance of productivity and the elimination of waste in the success of a company. Comments from respondents indicated what they perceived as helping or hindering the achievement of maximum productivity. The researcher believes that the combined information obtained from primary and secondary research fulfilled this objective.

A related secondary objective was to examine whether organisations were engaged in promoting office productivity and the methods by which they promoted this activity and communicated their vision to employees. Reading through the literature gave the researcher an understanding of the overall importance of promoting productivity and the elimination of waste in the success of a company. The primary research gave an insight into the methods used by companies to promote productivity and the extent to which this was conveyed to all employees. The researcher believes that the combined information obtained from primary and secondary research fulfilled this objective.

The next objective involved an examination of organisations understanding of lean office concepts and how management put their understanding of these concepts into practise. The secondary research gave the researcher an overview of the philosophy of lean. The primary research investigated the prevalence of the lean office and the extent of its implementation. The researcher believes that this objective was satisfied.

The final objective was to examine whether organisations are affiliated with any body of office improvement and to identify what measures the organisations were taking to obtain quality certificates and standards such as ISO's. The researcher asked respondents to list if their organisation was affiliated with a body of quality certification and to specify quality awards that the company had received or for the respondents to suggest why quality awards had not been received. The researcher believes this objective was thereby satisfied.

The tool used by the researcher to gather information was a questionnaire. This indicated the situation pertaining in the offices of the respondents with regard to work practices, training, office layout, waste, productivity and quality certification. This allowed the researcher to

categorise the change into various areas and weigh up the significance of each area in terms of productivity. As the research involved consulting with office workers industry it gave a good insight into contemporary issues regarding efficiency in the office environment.

The questionnaire was of great assistance in gathering a wide array of information in a short space of time. On the downside it doesn't allow much room for elaboration. However, if a researcher was pursuing an interview method the demands placed on all parties in organising such a meeting and keeping it on track would be difficult to reach. The interview method would also have a much smaller overall reach in terms of getting participants as opposed to the questionnaire.

Managers must look past short term goals to the achievement of a new mindset over a period of time. In the pursuit of lean excellence, it is necessary for the team leader to be appropriately qualified in the field. The appointed leader must be given the authority to pass on the information on lean to the employees to assist them in learning more about the concept and thereby achieve greater efficiencies in the process as a whole.

The scope of the research was limited and did not investigate whether managers who had received training in lean office had a programme in place for passing on the information on the lean philosophy to subordinates.

Lean office helps provide greater space efficiency and is a safer environment for employees. A clean environmentally friendly area is more enjoyable to work in and research would show that this tends to improve the levels of efficiency and mental well being of workers.

To create the ultimate lean office it is essential that waste is eliminated and if possible that the savings achieved from waste being eliminated being used to add value to the end product or service. In the primary research respondents gave numerous examples of different types of waste and the researcher concludes that if examples of waste are so obvious and so easily identifiable then the elimination of this waste would increase efficiency and reduce costs. Respondents were also asked if forms and processes have been analysed to identify opportunities to eliminate waste, the majority answered yes, therefore the researcher concludes that in the majority of enterprises there is a recognition that waste occurs and efforts are made to reduce it.

Many working in offices will have difficulty understanding the role value stream mapping or indeed 5s in their daily office routines and will consider lean as a manufacturing concept.

As Emiliani (2003) states, most businesses, whether service or manufacturing, public or private, profit or non-profit, are managed principally according to conventional, or “batch-and-queue”, practices. In batch-and-queue practice, materials are processed in large batches, which result in long queue times between operations.

With regard to lean manufacturing it is relatively easy to determine what customers perceive as non-value adding activities and the resources saved from eliminating these activities can be redirected into making the end product more efficient and user friendly. As Womack (1990) states lean is still closely related to manufacturing. In contrast, areas which are non-value adding in the office are more difficult to identify and efforts to implement widespread change to routine office can meet with stiff resistance if the prevailing attitude amongst staff is along the lines of this is how we do things around here. As Thompson (1997) states, when supervisors call on their staff to become more lean or competitive, workers inevitably see that as resulting in more work with fewer people performing the work. As he states lean has become a euphemism for understaffed and overworked.

A certain degree of conflict is to be expected when influencing lean. The office involves a broad diversity of personalities and a large number of integrated relationships that exist among people, resistance to change in certain quarters are inevitable. Staff must be positioned to work on processes they manage in order to demonstrate how lean thinking works and what benefits are possible.

With regard to the implications of the findings, it is clear to see that lean office has yet to be fully accepted with regard to being a philosophy which a company would use as part of its routines. Although, much literature exists with regard to lean manufacturing and such an approach has been highly successful for many companies including Toyota in Japan, the need to implement lean in the office is frequently overlooked. However, the remainder of the primary research conducted indicates that although lean office isn't practised, measures are used to ensure that office performance is maximised and the majority of companies have acquired at least one quality standard. This research serves to identify how the philosophy of lean office as a whole may not yet have been fully embraced but how efforts to achieve greater office efficiency, in general seem to have been carried out with a view to making the

office a means of generating efficiencies. With Ireland striving to achieve greater competitiveness with regards to cost, the whole concept of lean needs to be embraced, the constant talk of inefficiency and layers of bureaucracy is an area where lean can make a major impact. The elimination of waste in the office may help services to be produced at lower cost and thereby assist goods and services from this country becoming more efficient. Lean can help a company gain competitive advantage and while other companies can match this, the first-mover advantage that can be obtained from being one of the rare companies to practice lean will in time provide the company with a competitive advantage if all parties approach the situation in the right manner. Another area which may serve certain firms well is an investigation into forms and processes with a view to achieving greater efficiencies. As the research showed, just over half of the companies had reviewed their forms and processes with the view to making them more efficient. While the office environment is regarded as efficient in most companies seen in this research, forms and processes have perhaps been overlooked as a source of competitive advantage. A possible example of this may be an insurance firm where an insurance form could be completed over the phone with a view to making it easier for customers. Rather than saying this is how we do it around here with regard to forms and processes, firms must examine why they complete forms and processes in a particular manner and whether there are future opportunities to complete these tasks in a more efficient manner. Another area which may be worthy of examination is the degree to which companies measure productivity and include it in their future plans. Obtaining value for money for resources invested is a critical feature of any company. However, setting legitimate targets for employees to achieve must be derived from consultation with employees and a means must be used to give a true and fair reflection of the productivity obtained from office staff which sometimes is difficult to measure. Also the method of measurement must be consistent over a period of time to allow a company to succeed. Another area of the findings which was interesting was that a number of respondents had no knowledge as to areas such as productivity measurements and quality standards obtained by the business. This would be regarded as quite a worrying situation as productivity and quality standards are part of office workers everyday jobs. They ought to be striving towards matching the productivity standards set and attempting to reach the standards of quality required to obtain certification and matching the quality standards set by independent bodies such as ISO.

The research conducted involved many limitations. As the timeframe involved in completing the study was quite short it was necessary for the researcher to gather as much information as possible within a short timeframe. For this purpose the questionnaire was the most obvious means of achieving this aim. The questionnaire managed to gather a large number of responses, yet these responses are unlikely to be representative of the working office population as the researcher was restricted to sending questionnaires via E-Mail to companies for which a contact address could be found and due to restrictions with regard to confidentiality and due to the difficulty in obtaining responses to unsolicited questionnaires it is impossible to know who responded to the survey and whether those who respond to a survey are likely to have different views to those who choose not to respond to a survey. Also, while an interview session with some office workers may have provided the researcher with a wider range of material, it mightn't necessarily have been as efficient with regards to time as the questionnaire was and mightn't have provided the responses to the core questions which the study required the researcher to find an answer for.

The conclusions drawn from this case study can add to the body of knowledge with regard to lean office but is only representative of a small segment of the office working population and as such the results obtained must be placed in this context.

Other limitations to the research include respondents simply providing the reply they believe the surveyor wants to hear or suspecting that despite assurances that the responses aren't confidential and therefore providing an overly positive response to questions involving their company in the questionnaire. Also issues with regard to understanding of questions affected the results but this was limited due to a pilot questionnaire being performed and the layout being fine-tuned as the early responses began to come in. Another issue which the researcher attempted to overcome was the central tendency bias. To overcome these four answers were provided to some questions to attempt to get respondents to fall on one side of the fence rather than appear neutral on an issue of importance in their office. Questionnaires have these limitations but provide benefits as outlined by McClelland (1994). According to McClelland, there are many advantages in using survey questionnaires. They can be administered to a large population because they do not require individuals from different geographical locations to assemble in one primary place, and thereby avoid considerable cost. They are a non-invasive means for gathering responses, as opposed to individual interviews, focus groups, and sometimes on-site observations, because respondents can provide input in a tension free environment and at their convenience. Thirdly, McClelland (1994) believes that

biasing can surface in individual interviews owing to the manner in which questions are posed by the interviewer and are perceived by the respondent which can skew the results. As questionnaires are usually relatively straightforward to answer, McClelland (1994) argues that the completion of questionnaires doesn't take an excessive amount of time. While limited in general applicability of this study is questionable, all efforts were made by the researcher that the questionnaires issued reflected a variety of organisations both in terms of size and in terms of the sector in which they operate and the tasks which they complete on a daily basis. Having used an online tool for collecting a proportion of the responses it is difficult to state which companies responded in keeping with the need for confidentiality but from the percentage obtained it is fair to say a broad diversity of respondents submitted the questionnaire which gives it a degree of legitimacy.

Future research on this area may centre on topics such as, lean office or office efficiency in the public sector when compared with the private sector. This would be a topic of great interest at present times as the need to get greater value for money from public resources intensifies. Research in this area may reveal whether in fact public sector offices are less efficient than their private sector equivalents.

Another question may focus on the reasons why some companies regard lean office as a vital tool in securing competitive advantage, while others don't haven't yet embraced the concept.

Lean as a whole is a broad topic, but research with regard to lean is still relatively limited and in particular in an Irish context hasn't been documented to any great degree. Further research could identify whether its lack of recognition it is due to a shortage in knowledge about lean, a lack of confidence in the potential benefits to be obtained from using lean, a lack of training facilities available to conduct lean training or some other reason which makes it uneconomical for a particular office to pursue lean.

Other topics may include the role of lean in Small and Medium Enterprise offices. As mentioned earlier, the competitiveness of the country as a whole and the call for greater value for money from the public sector are current issues with which lean could be linked.

In an office context in particular, time and time management are central to the philosophy of Lean. This involves looking at how responsiveness to customers can be improved and making sure time isn't being wasted while doing unnecessary things at work (Minoura, 2002).

If lean is to be successful, the rationale behind introducing lean and the benefits that are to be derived from using lean must be identified. The fundamentals of the lean concept must be passed down by an individual who is knowledgeable in lean and who has a genuine understanding of its fundamental principles. This is demonstrated by Emiliani et al. (2003) who suggested that leaders that understand and practice lean well, create formidable businesses that compete on the basis of time because information flows with fewer or even no interruptions. Examples of this information flow would include parts, documents, data, and verbal communication. Lean is a long term philosophy and training such as one-hour of online training would appear to have little benefit in the attempt to introduce the philosophy into the workplace unless the philosophy is re-enforced by a legitimate lean champion in the workplace. Lean must be introduced systematically and with a long term objective. It mustn't be abandoned if the initial short term results from its introduction don't yield the desired results.

Creating a safe working environment is an essential prerequisite of creating an efficient and responsive office. In order to achieve the desired level of productivity, workers must feel confident in the safety of the environment in which they operate. From the responses obtained from the questionnaires it is clear that many respondents would like to see a reduction in the volume of paperwork. The lean philosophy would be of benefit in achieving this objective.

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Appendices

Appendix A

In Liker's (1997) book 'The *Toyota Way*' fourteen principles are outlined as to the way in which Toyota, the original founders of lean, apply their principles.

- 1 Management decisions have are founded on a long-term philosophy, even if this negatively affects short-term financial goals
- 2 They believe that if the process is right the results will be right
- 3 Use "pull" systems to avoid overproduction
- 4 Level out the workload
- 5 The belief is that if a problem arises they stop and put right the problem in order get quality right the first time
- 6 Standardized tasks are the basis for continuous progress and worker empowerment
- 7 Visual controls help identify problems and ensure that potential difficulties aren't hidden
- 8 Reliable, thoroughly tested technology that serves your people and processes is of paramount importance
- 9 Leaders must be developed who comprehensively understand the work, live the philosophy, and educate others on its benefits
- 10 Exceptional people and teams are developed who follow your company's philosophy
- 11 Your extended network of partners and suppliers can be challenged to improve and you can make efforts to assist them while respecting their philosophy
- 12 It is important to see the processes in action to comprehensively comprehend the situation
- 13 Decisions are made gradually by consensus, having thoroughly considered all options. Once a decision is made it is implemented rapidly
- 14 Learning through relentless reflection and continuous improvement assists the organization in its future development

Appendix B

Liker's book also identifies tips for transitioning a company to a lean enterprise:

- 1 Action on technical systems must come first, followed swiftly by cultural change
- 2 Learn by doing first and training second
- 3 Begin with the value stream pilots to exhibit lean as a system and supply a "go see" model
- 4 value stream mapping should be used to develop future vision state visions and help "learn to see"
- 5 Kaizen workshops should be used to teach and make quick changes
- 6 Categorize around value streams
- 7 Make it compulsory
- 8 A crisis may instigate a lean movement. However, it may not be essential to turn a company around
- 9 Be proactive in recognizing opportunities for immense financial impacts
- 10 Metrics ought to be realigned with a value stream perspective
- 11 Your company's roots is a foundation for developing your own way
- 12 Lean leaders should be hired or developed from within and a clear succession system ought to be developed
- 13 Experts should be used to teach and to get quick results

Appendix C

Questions for employees

1. My everyday processes and tasks are well defined
2. I track my personal performance on a daily basis with numerical measures
3. Most of my workgroup's processes are clearly defined and understood by most group members
4. Managers make it easy to understand their decisions
5. My work group's supervisor provides us with timely information about changes so that we can respond quickly
6. My work group has a short daily meeting to bring us up to date on what is happening today and how we did yesterday
7. For many problems that occur in my workgroup there is a single course of action that almost everybody in the work group understands
8. My work group has a formal plan to gradually improve the performance of day to day processes over the next couple of years

Appendix D

Mobilia-Witte and Huls (cited in *Lean Administration: Case Studies in Leadership and Improvement*) have also pooled several suggestions for lean improvement projects based on their experience.

- They regard training as a must to help team members comprehend why they are a part of the occurrence and what they can contribute
- Team members must have decision-making authority to make process changes in their area of influence
- Team members should be focused on the process. For example they must not take long breaks to return to their desks for phone calls and other projects. "You need to find a way to keep them engaged in the event"

- The interviewing process required for process mapping is a draining, but worthwhile activity.
- Focus on the process, not individuals. Also focus on process improvement rather than simply eliminating process steps.
- Facilitators must be unbiased and willing to change direction to meet the goals. The team, not the facilitators must have ownership in the future state.
- Event results are not always quantitative, many are qualitative: “We no longer have a goal of eliminating 50% of process activities” said Mobilia-Witte and Huls. “The Lean Office Process usually results in 20-90+ percent reductions.”
- Keep lean office processes simple. For example simply questioning e-mails can help to streamline processes. (Lean Administration: Case Studies in Leadership and Improvement, Association for Manufacturing Excellence, 2007, productivity press)

Appendix E

Bureaucratic Structure

The bureaucratic organizational structure is an obstacle to overcome in attempting to implement lean office. Pugh (1990) categorizes three ideas as central to the concept of bureaucracy. These are:

1. The idea of rational legal authority
2. The idea of ‘office’
3. The idea of ‘impersonal order’

Pugh also highlights a number of fundamental elements related to the bureaucratic structure:

- It is viewed as a continuous organization of official functions bound by rules, with a specified sphere of influence, within which offices follow the principle of hierarchy
- Administrative staff are separated from ownership of production or administration and there is no appropriation of his official position by the incumbent
- Administrative acts, decisions and rules are formulated and recorded in writing even in cases where oral discussion is the rule or is even mandatory.

The bureaucratic structure is apparent in several companies. In their studies McHugh and Bennett (1999, p.81) studied change in a large public sector organization and described it as follows:

“A rigid bureaucratic maze typified structural formation within many such organizations with the majority of members having narrowly defined and highly specialized jobs, and being protected from making decisions through their constant deference to authority and reference to their rule book”.

Morgan (1997) defines bureaucracy in the following terms: Rule exercised through use of the written word, which provides the basis for a rational-legal type of authority or ‘rule of law’.

In the successful implementation of lean office, companies with a bureaucratic structure will require an even greater degree of transformation, as the company’s structure and set of principles run contrary to those expressed in the lean philosophy. Some degree of control is necessary in all workplaces and a certain degree of bureaucracy is required to ensure a company complies with its obligations. If lean is to succeed within an organisation, it must strive to reduce red-tape to assist in the successful streamlining of processes.

However, Ballé (1999) argues that bureaucratic organisations can often deal with high volume of activity quite as well as a bureaucracy than other forms of organisations. Strangely enough, bureaucracies excel at the overall efficient use of resources. He argues that considering the volume of activity such systems handle, the waste proportion is often not that large with respect to the resources/activity volume ratios. Ballé (1999) goes on to suggest that when operated sensibly, a bureaucracy is efficient because it benefits from economies of scale and avoids duplication of effort, whilst maintaining standards of quality.

Appendix F

Customer Segmentation

As well as examining customer needs, it is important to look at the organisational structure in designing a plan which will help to improve service delivery and reduce waste. Thus, the demands placed on the organisation by the customer must be considered alongside the operational capability to deliver services to the customer (Chenet et al., 1999)

Schmenner (1986), states that the major challenge facing service systems is devising delivery systems that meet acceptable service levels based heavily on the degrees of labour intensity, contact, and customization provided for the customer. Chase and Tansik (1983) indicate that the major environmental factor is the length of time a customer spends in the system. In contrast, Berry *et al.*, (1983) believe the major factors to be the expectations and perceptions that a customer has of a particular service.

While eliminating waste is the primary focus of the lean office. The savings generated from this can be channelled into adding value to the company's final offering to their customer. As, Thompson and Richardson (1996) state that organizations, whether profit-seeking or not-for-profit, must add value for their customers if they are to be successful. As Porter (1980) posits, organizations which achieve high levels of value-adding differentiation and/or relatively advantageous cost and operating efficiencies will achieve competitive advantage and earn profits which are higher than the industry average.

In the implementation of lean office, George et al (2005) suggest that you must identify the characteristics of your customers. Once data is known about your customers, those who purchase your product or service can possibly be grouped into differing segments in order to achieve increased efficiency and enables the company to offer the right product or service to the right consumer.

George et al (2005) define customer segmentation as the principles for identifying subsets of customers who may have differing needs or requirements. Customer segmentation is particularly valuable for any team dealing with a moderate to large customer base. Customer segmentation helps identify and centre on the subgroups of customers who generate the highest value from the product, service, or process being designed or improved. In using customer segmentation, a company must classify the output being considered, identify the customers of that output, identify the segmentation characteristics that the company believe may influence how a customer or group responds to your company and its products or services, develop profiles of the segments you will seek out for your projects, representatives from each segment should be included in whatever customer contact you instigate and the results of the process should be documented. Massnick (1997) documents how it costs approximately five times more to gain a new customer than to keep an existing one. He also states that it costs ten times more to get a discontented customer back.

In keeping with customer segmentation, kano analysis is a good tool for better understanding what value your customers place on the features of your service, which can reduce the risk of providing services that over-emphasize features of little importance or that miss critical features. Kano levels comprise of dis-satisfiers-basic requirements, satisfiers-performance requirements and delighters-excitement requirements.

However, some academics believe that consumer likes and dislikes are converging. According to Levitt (1983, p. 93), the global corporation is able to produce universal products for a worldwide audience because “the world’s needs and desires have been irrevocably homogenized.”

Appendix G

Organizational Politics

In implementing lean office, the culture of the company must be taken into account. Employees of the company must see the benefit from not just the company’s perspective but from their individual viewpoint also. The change must be sold to employees and feedback must be obtained from all members of staff. www.leadershipnow.com/changequotes.html quotes Drucker as saying “Company cultures are like country cultures. Never try to change one. Try, instead, to work with what you've got.”

In instigating change to procedures it is important for managers to take into account both the formal elements and informal elements within a firm. The ‘organisational iceberg’ of Senior and Fleming (2006, P.139) outlines the elements apparent in both the formal and informal organization. It is clearly outlined in the metaphor of the iceberg that there are overt and covert facets to organizations. It also indicates that the informal systems are hidden, yet account for a greater percentage of the organizational iceberg. The analogy outlines the difficulties in determining both the extent and the characteristics of the hidden part of the iceberg. Elements of the formal organization include goals, strategy, structure, systems and procedures, products and services, financial resources and management. The informal organization includes fundamentals such as values, attitudes and beliefs, leadership style and behaviour, organizational culture and norms of behaviour, power, politics and conflicts and informal groupings.

A survey conducted in 1997 in relation to change management and organizational politics involving 90 English managers indicated that politics was a distracting side issue compared to the issue of organizational performance. 72% agreed that the more complex and wide-reaching the change, the more intense politics became. (Buchanan and Badham, 1999, p.19)

This gives an indication as to how sensitive office politics are and the issues which must be dealt with if lean office is to be implemented successfully.

Ioma.com (December, 2008) Controller's Report states that lean programs can succeed in a wide range of businesses and functions. However, in implementing lean, there must be widespread awareness of the challenges that different cultures present and the approach taken towards the implementation of lean must be customized accordingly. For instance, people in an entrepreneurial culture that incentivises individual initiative mightn't welcome enterprise wide programs. In these environments, the report suggests that a better approach is to use a "cascading" process in which managers tailor lean messaging metrics to their groups. This, the report states, increases buy-in and better addresses the specific objectives at different levels of the organization. Similarly, a culture that prizes skilled individual contributors may not welcome team-based structures. This type of culture demands an employee-led, bottom-up approach that doesn't dampen creativity; a top-down mandate would be likely to backfire. A third example centres on companies with a strongly hierarchical culture and independent fiefdoms, with little standardization or sharing of knowledge. To succeed in this type of organization, lean programs must focus on breaking down barriers and empowering employees.