

Dissertation title

‘The effects of an organisation-wide Lean transformation on the employee experience of job quality and associated outcomes: A study of laboratory operatives in Irish-based pharmaceutical manufacturers’

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**This dissertation is submitted in partial fulfilment of the requirements for the Degree of Master of Business Studies,
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ABSTRACT

This study set out to discover the actual experiences of employees during a Lean transformation. This generated research objectives pertaining to organisational and employee expectations and the employee experience of job design and quality. The literature review identified themes related to respect for people (Ohno 1988; Emiliani, 2008a and 2008b), Lean job design (Conti et al. 2006; Womack et al.2007), and the debate on the implications of lean for employee outcomes (Parker 2003; Angelis et al. 2011; Johnstone et al.2011). Whether Lean is a positive or negative force prompted the study of laboratory operatives in Irish based pharmaceutical manufacturers that have implemented Lean. This particular population and sample was chosen because of their high standard of education and the perceived high job quality inherent in such organisations.

The research methodology employed was a qualitative inquiry based in grounded theory employing semi-structured interviews to gather primary data. Two Irish based Lean pharmaceutical organisations agreed to facilitate the study and three participants from each organisation took part in semi-structured interviews in June 2014. The data gathered was analysed using Nvivo software

When the findings were considered against the literature it was apparent that the experiences of the employees in each organisation divulged from one another. This was due to differing management reasons for and approaches to the implementation of Lean. Concentrating Lean tools on cost cutting fuels work intensification and a decrease in job quality. While a lack of a clear and consistent communication strategy causes employees to disengage from the process. When an organisation is aware of its obligations regarding the respect for people principle and acts accordingly employees engage with the process and report enhanced job outcomes. These findings point to Lean being a neutral philosophy for continual improvement with the outcomes for employees dependent on the particular attributes of the organisation.

DEDICATION

It is my privilege to dedicate this dissertation to my wife Clodagh Clancy whose encouragement, belief and forbearance made completion of the Masters in Lean Business possible.

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I would like to acknowledge the assistance and guidance of the lecturers at WIT it has been my pleasure to work with over the course of the past two years. In Particular I would like to voice my appreciation to Mr Darrin Taylor, Mr Aidan Walsh and Dr. Pio Fenton who were the prime movers behind the Lean MBS project.

I would also like to acknowledge my fellow students in the Lean MBS who have always been willing to lend their assistance whenever possible.

ETHICAL DECLARATION

Ethical Declaration

I declare that this document is wholly my own work except where I have made explicit reference to the work of others. I have read the chapter ‘Doing a Dissertation at WIT’ in the text *Professional and Academic Skills*, and hereby declare that this dissertation is in line with these requirements. I have discussed, agreed and complied with whatever confidentiality or anonymity terms of reference were deemed appropriate by those participating in the research and dealt appropriately with any other ethical matters arising.

I have uploaded the entire dissertation as one file to Turnitin® in Moodle, examined my ‘Originality Report’ by viewing the detail behind the overall ‘Similarity Index’, in the ‘Match Overview’ listing, and have addressed any matches that exceed 3% in this listing. I have made every effort to minimise my overall ‘Similarity Index’ score and the number of matches occurring.

John O’Mahoney

22/08/2013

Date

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1 CHAPTER 1 INTRODUCTION

1.1 Chapter Introduction

This chapter outlines the rationale for why the area chosen for research was selected, and explains the contribution that this study is expected to make both practically and academically. Next the research problem is explained; and the research question outlined with the research gap identified and clarified. The research method employed is introduced and the selection of the method justified. This chapter concludes with an outline of the overall structure of the dissertation.

1.2 Research Rationale

Lean philosophy is an area of management that has been widely researched and a rich canon of academic literature exists on the subject. Some elements of the literature available address the place of people within the socio-technical system that constitutes a Lean organisation. However there is little agreement on the experience of employees in a Lean environment. This study seeks to draw on the literature and undertake original research to add to the understanding of how employees experience a Lean transformation against the expectations and predictions of the organisation where they are employed. This area of research has been prompted by the high level of reported incidences where Lean has failed, or has achieved some improvement in bottom line results that have not been sustained. The Lean failures have often been accompanied by reports of employee dissatisfaction with the effects of Lean implementation on job quality. On the other side of the equation those organisations that have successfully and correctly applied Lean principles report improved employee outcomes.

1.3 Research Problem

A view is taken by some authors that that Lean is hostile to the psycho-social needs of employees and that it inevitably leads to work intensification, resulting in reduced job satisfaction outcomes and worker disengagement (Parker 2003; Stewart et al. 2010; Carter et al 2012; 2013), Others see Lean as affectively neutral with outcomes wholly dependent on management style, they posit that social and cultural reasons lie behind

a lack of understanding of the respect for people principle. It is offered that this is responsible for the basic misunderstanding of Lean principles with negative consequences for employees (Conti et al. 2006; Seddon and Caulkin 2007; Angelis et al. 2011; Bhasin 2011). While there are studies that see Lean as wholly positive for employees, they are fewer and less strident than the negative view (Seppälä and Klemola 2004; Johnstone et al. 2011; Hasle et al. 2012).

Of the positive opinions, the Johnstone et al. (2011) findings stand-out as they are almost wholly positive, reporting improved working experiences for research and development employees at pharmaceutical manufacturer Astra Zeneca UK. However, Cullinane et al (2013) suggests a complex and contingent tension underlies the employees' experience of job design in a Lean environment.

1.3.1 Research Gap

The research gap identified for investigation is focused on the effect of Lean implementation on job quality outcomes for laboratory employees whose educational attainment and the nature of their work are seen as inherently high quality. There is evidence that the psycho-social aspect of job design is damaged by the application of Lean tools, however it is unclear if this is because of, or in spite of, the application of Lean philosophy (Emiliani, 2008; Bicheno and Holweg, 2009; Angelis et al., 2011; Carter et al., 2011, 2013; Cullinane et al. 2013).

1.3.2 Contribution of the Research

It is the objective of this dissertation to examine the research gap in the context of Irish-based pharmaceutical organisations. The resulting analysis of the research undertaken may offer an insight into how employees perceive the experience of Lean transformation and the effect it has on job quality. This may be useful to the organisations involved or the wider industrial and commercial arena when considering formulation of strategies for Lean job design and employee engagement policies. Furthermore it may act as an indicator to those academics concerned with Lean practice on areas that may be suitable for further investigation

1.3.3 Research Question

The title of this work is: ‘The effects of an organisation-wide Lean transformation on the employee experience of job quality and associated outcomes: A study of laboratory operatives in Irish-based pharmaceutical manufacturers’. The ensuing research question is:

‘In an organisation-wide Lean transformation, what were the employees expecting would be the impact of the Lean transformation on their job quality and associated outcomes; and what were the actual effects of the Lean transformation on their job quality and associated outcomes?’

1.3.4 Research Objectives

The aim of this research was to discover the ‘what, how, and, why’ of the employee experience of the Lean transformation when compared with the organisational expectations. This was examined through the effects of the Lean transformation on job quality and the associated outcomes. The focus of the research was divided into a number of primary and secondary objectives.

The primary research objectives had two dimensions. Firstly to discover what outcomes the organisation expected employees to experience, and what outcomes the employees expected to experience. Secondly, the research sought to uncover what job quality related outcomes the employees actually experienced during the Lean transformation.

The secondary research objectives were to compare the experiences of participants in two separate organisations and to discover any critical factors that affect employee engagement with the Lean transformation.

1.4 Research Methodology

The research problem, involving the organisational expectations and employee experiences within Lean organisations, is investigated through qualitative inquiry using grounded theory. As an inductive approach grounded theory is suited to a qualitative enquiry involving people and organisations, and the use of grounded theory can capture the complexity inherent in such relationships. Grounded theory can also provide an alternate view of a previously investigated field. The grounded theory approach is embedded in the area under investigation so any emergent theory or insight can be directly related to practice (Bryman and Bell, 2010; Hennink et al., 2011; Byrne, 2013).

1.5 Structure of the Dissertation

The Dissertation begins with this chapter which offers a brief outline of the study at-hand. Chapter two presents the literature review that forms the academic basis for the research question. Chapter three details the methodology chosen for the research methods, data gathering and analysis. Chapter four presents the research findings. Chapter five is the discussion chapter and offers the interpretation of the findings from the literature and the primary research. Finally, chapter six will provide the conclusions drawn from the results of the research.

2 CHAPTER 2 LITERATURE REVIEW

2.1 Chapter Introduction

This chapter explores pertinent academic literature to uncover and explore theoretical concepts and research studies germane to the research question. In keeping with the context of the research question, Lean philosophy is the central focus of the literature review. However, while the research is rooted in Lean philosophy, the concepts of systems thinking, job design, management behaviour, change management, and employee experience have emerged from the exploration of the literature and are considered with regard to the research question. Due to the nature of the investigation and the interrelationships between concepts, there are areas where themes and authors overlap and commonalities emerge within, and between themes.

2.2 Lean Philosophy

Lean is a holistic management philosophy that seeks to deliver value to the customer by eliminating waste and continually seeking improvements through engagement with, and utilisation of, the entire workforce. The objective of Lean is to achieve more output while using fewer resources, thus creating the capacity to deliver value to the customer (Womack and Jones 2003; Bicheno and Holweg, 2009).

2.2.1 Lean as a System

Work organisations are socio-technical systems, and, in order for Lean to be successful from an employee standpoint, the process of social change must be carefully managed (Bicheno and Holweg, 2009: 203).

Lean is a system and not merely a set of tools that can be applied to current practice. For Lean to succeed at both organisational and human levels, its implementation must be considered as a holistic rather than a reductionist philosophy (Senge, 2006; Seddon and Caulkin, 2007; Bicheno and Holweg, 2009). For employees, the socio-technical

nature of Lean has a reciprocal relationship with the psycho-social factors of job design (Ohno, 1988; Womack et al., 2009; Bicheno and Holweg, 2009; Carter et al., 2013).

According to Mann (2012) Lean production is intuitive, easily understood, and the most effective way to approach business operations; however most attempts to introduce it fail or are only partially successful. Bhasin and Burcher (2006) address this issue by suggesting that Lean must be considered as a guiding management philosophy - if an organisation only utilises Lean as a suite of tools at a tactical level then any gains are invariably short-term and unsustainable.

Culture is at the heart of organisational and individual behaviour, and it is described by Schien (2004) as the evolutionary development of the way things get done in an organisation. Culture is an agglomeration of learned behaviours that are deemed acceptable, both tacitly and explicitly, by the organisation and its employees (Schien 2004; Mann 2005).

According to Bhasin (2012), if an organisation is to successfully adopt Lean as its management philosophy it must remake its culture according to Lean principles. Bhasin (2012) argues that the organisation must align words with deeds, and the expected outcomes espoused by the organisation must be supported by a commitment to Lean learning and a willingness to accept and act on employee feedback.

Mann (2012) posits that the reason for Lean failures is the influence of resilient cultural mores that undermine management efforts to inculcate a Lean mind-set. According to Bicheno and Holweg (2009), and because Lean is a socio-technical system, changes must be optimised and mediated at the physical, environmental, and human interfaces, as most issues can be traced back to the process not the people. Having established that Lean philosophy must operate within a system, Bicheno and Holweg (2009: 203) cite the ten system laws developed by Senge (2006) to explain

how and why implementation of Lean transformations may end in failure (See Table 2.1: The Laws of the Fifth Discipline). This is where the law of unintended consequences can render a Lean transformation untenable as an adjustment in one area can cause problems in another area. According to Bicheno and Holweg (2009) the concept of process bottleneck can be replicated on a human level by individuals who, because of changes to the social system, can erect insurmountable barriers to the Lean transformation (Bicheno and Holweg, 2009; Bhasin, 2012; Carter et al., 2012).

Mann (2005) suggests that the primary influence on the construction and maintenance of organisational culture is the prevailing system of management. Bicheno and Holweg (2009) argue that for an organisation to gain the cooperation and commitment of its employees to Lean transformation the organisation must align its culture with Lean principles. In the absence of a guiding management theory of Lean that explains and facilitates employee engagement, Lean transformations are likely to result in resistance and failure (Bicheno and Holweg, 2009). This opinion is supported by Lareau (2001) who holds that the systems of management operated by many organisations are emergent and based on learned behaviours, and have developed in the absence of any theoretical underpinnings.

Table 2.1: The Laws of the Fifth Discipline

Senge (2006) The laws of the fifth discipline	
Today's problems come from yesterday's solutions.	Leaders are happy to solve problems, but don't always think about intended and unintended consequences. Too often our solutions strike back to create new problems.
The harder you push, the harder the system pushes back.	Humans have a stubborn tendency to bully our way through tough situations when things are not working out as we would hope. We charge ahead without taking time to think through solutions to find better alternatives. Sometimes we solve problems; more often, especially in the current environment, we find ourselves up to our ears in more problems.
Behavior grows better before it grows worse.	Short-term solutions give temporary improvement at best but never eliminate fundamental issues and problems. These underlying problems will make the situation worse in the long run.
The easy way out leads back in.	Leaders often have a few quick fixes in their "quiver" of solutions that have brought quick and easy success in the past. Too often, the easy way out is retrofitting these fixes to any situation without regard to the unique contexts, people and timing.
The cure can be worse than the disease.	Often, the easy and familiar solution is not only ineffective but addictive and dangerous. It might even induce dependency.
Faster is slower.	At the first taste of success, it is tempting to advance at full speed without caution. Remember that the optimal rate of growth or change is far slower than the fastest growth or change that is possible.
Cause and effect are not always closely related in time and space.	We are good at finding causes, even if they are just symptoms unrelated to root causes.
Small changes can produce big results -- but the areas of highest leverage are often the least obvious.	The most grand and splashy solutions -- like changing company policy, vision, branding or tagline -- seldom work for transforming change. Small, ordinary but consistent and repetitive changes can make a huge difference.
You can have your cake and eat it too -- but not all at once.	Rigid "either-or" choices are not uncommon. Remember that this is not a dilemma if we change our perspective or the "rules" of the system.
Dividing an elephant in half does not produce two small elephants.	As a leader, you can fail to see the system as a whole at your peril. This flaw in perception and vision often leads to suboptimal decisions, repeated tasks, lost time and energy, and maybe even losing followers.
There is no blame.	People and organizations like to blame, point fingers and raise suspicions about events, situations, problems, errors and mistakes. Sometimes we even believe the blame we throw around. In reality, we and the cause of events, situations, problems, errors and mistakes are part of the system.
Adapted from Bicheno and Holweg (2009)	

2.2.2 Management Behaviours

Hines et al. (2011) assert that the behaviours exhibited by individuals within the organisation are a product of both organisational culture and the values and competencies of the individual. Hines et al. (2011) suggest that training and communication are necessary if management and workers are to adopt Lean behaviours. This becomes an issue when management are tasked with the responsibility of supporting workers during a Lean transformation, as the critical point of contact for the flow of information is between the employee and their line manager. According to Hasle et al. (2006), Lean philosophy has no propensity to disadvantage workers, it is the style and application of management within the organisation that will shape the employees' experience of the Lean journey. According to Dahlgaard and Dahlgaard Park (2006) an organisation that wishes to undergo a Lean transformation must abandon the existing management philosophy and fully embrace Lean as a socio-technical basis to remake the existing culture.

According to CIPD (2012), management behaviours are a key influence on the affective commitment of employees to organisational goals. Key management competencies (shown in Table 2.2: Management Competencies for Employee Engagement) are necessary to support employees through the various stages of behavioural change implicit in organisational change. CIPD (2012) suggest there are some key management competencies that are a prerequisite if an organisation is seeking to gain employee commitment and secure engagement. This outline of key competencies would seem to be in agreement with the guiding principles and characteristics of Lean as described by Bicheno and Holweg (2009) regarding trust, guidance, partnership, and knowledge.

Dahlgaard and Dahlgaard Park (2006) hold that prior to an organisation undertaking a Lean transformation it must first understand the competencies and capabilities of the organisation's human capital. It is argued that the core values and core competencies of its entire people, both management and workers, must be aligned with the Lean vision. To enable a Lean transformation the organisation must make a conscious effort to remove all vestiges of highly-stratified Taylorist management (Dahlgaard

and Dahlgaard Park, 2006). Mann (2005) argues that overlaying Lean methodology and tools on an incumbent management system will make that pre-existing management system an insurmountable barrier to the Lean transformation.

Table 2.2: Management Competencies for Employee Engagement

CIPD (2012) Management competencies for enhancing employee engagement		
Theme	Management competency	Description
Supporting employee growth	Autonomy and empowerment	Has trust in employee capabilities, involving them in problem-solving and decision-making
	Development	Helps employees in their career development and progression
	Feedback, praise and recognition	Gives positive and constructive feedback, offers praise and rewards good work
Interpersonal style and integrity	Individual interest	Shows genuine care and concern for employees
	Availability	Holds regular one-to-one meetings with employees and is available when needed
	Personal manner	Demonstrates a positive approach to work, leading by example
	Ethics	Respects confidentiality and treats employees fairly
Monitoring direction	Reviewing and guiding	Offers help and advice to employees, responding effectively to employee requests for guidance
	Clarifying expectations	Sets clear goals and objectives, giving clear explanations of what is expected
	Managing time and resources	Is aware of the team's workload, arranges for extra resources or redistributes workload when necessary
	Following processes and procedures	Effectively understands, explains and follows work processes and procedures

Womack and Jones (2003) hold that unless workers feel that a sense of affective reciprocity exists with the organisation they are unlikely to give their full commitment to the Lean transformation. Angelis et al. (2011) suggest that behavioural as well as technical and social factors must be considered when considering strategies for understanding the employee experience of Lean transformation. According to Bicheno and Holweg (2009) reliance on bottom-up implementation of Lean, unsupported by a clearly communicated and supportive plan from senior

management, is a recipe for failure. The key elements necessary for Lean success are management commitment, a flow of reliable communication, and the introduction or continuation of role autonomy. It is particularly important to ensure line managers have the skills and competencies to deliver Lean support (Bicheno and Holweg, 2009: 44). Mann (2005) holds that most organisations do not understand the concept of Lean management. This is vital because the nature of organisational culture mediates Lean success or failure; however, culture is a product of management philosophy (Mann 2006). It is suggested that the cultural context of the organisation, and the level of trust and inclusiveness demonstrated by management, are the surest predictors of employee experience of Lean transformations (Hasle et al., 2006; Emiliani 2008a and 2008b; Angelis et al., 2011).

2.2.3 Change, Communication, and, Expectations

According to Lucey et al. (2005) the success or failure of Lean implementation is normally seen as a failure of change management. However they posit that there is confusion between change and transformation. Lucey et al. (2005: 9) explain that change is situational, environmental, and external to the individual, while transformation is a psychological process that the individual experiences when dealing with the new reality.

Lucey et al. (2005) hold that the key to a successful Lean transformation is to have an already highly engaged workforce before the organisation begins the Lean transformation. Dahlgaard and Dahlgaard Park (2006) suggest that in order for a Lean transformation to be successful the organisation must have a leadership that understands Lean philosophy and is capable and committed to clearly communicating the vision and expectations inherent in the Lean journey. However Dahlgaard and Dahlgaard Park (2006) hold that this must be balanced by management respecting the voice of an empowered workforce that is supported in gaining an understanding of Lean philosophy.

According to Losonci et al. (2011) employees are principally interested in the micro-environment of their particular work setting within the organisation. This means that an organisation that only communicates at the macro level of strategic direction can overlook the immediate concerns of employees at the coalface. Losinici et al. (2011) suggest that communication must be conducted at all levels within the organisation from the general strategic direction to the particular expectations, obligations, and effects the Lean journey will have for groups of workers and individual employees.

Tracey and Flinchbaugh (2011) hold that the people dimension of Lean is not given sufficient weight by organisations undertaking a Lean transformation, with most of the effort expended on technical training involving Lean tools. It is suggested that there are five variables that must be undertaken by organisations to ensure a successful Lean transformation. From an employee experience perspective the importance of communication with employees regarding their individual role is noteworthy (Table 2.3: Sustaining Lean Transformation).

Table 2.3: Sustaining Lean Transformation

Five Recommendations for Sustaining a Lean Transformation
1. Develop teams as a supporting structure of Lean
2. Calculate and Communicate metrics regularly
3. Communication among organisation members, particularly across functions
4. Communication to employees regarding their specific role in the transformation
5. Acknowledgement and celebration of milestones toward Lean transformation
Adapted from Tracey and Finchbaugh (2011)

According to Tracey and Finchbaugh (2011) the flow of information associated with Lean transformations is often focused on the process not the people, and this can create barriers and resistance. It is further argued that constant flow of two-way communication regarding mutual responsibilities and obligations is necessary to avoid role and task confusion.

Lucey et al. (2005: 12), using the unfreeze-change-refreeze model developed by Lewin (1947), found that employee engagement and communication is a key component of successful Lean outcomes. The absence of a clear and realistic communication of reciprocal obligations and objectives between the organisation and

its employees during the unfreeze stage can alienate employees and fatally undermine Lean transformation. The idea that there must be total management buy-in for the success of Lean transformations is well documented, and this is normally achieved through the technical and logical demonstration of Lean success stories (Kotter, 1996; Womack et al., 2007; Bicheno and Holweg, 2009). However it is equally important that employees trust and believe in what the organisation asks them to do and tells them to expect from the Lean transformation process (Hasle et al., 2006; Emiliani 2008a and 2008b; Angelis et al., 2011). This would appear to tie-in with the original respect for people principle of the Toyota Production System TPS. However it should be noted that the respect for people principle is also concerned with the areas of role autonomy and job design (Ohno 1988; Emiliani, 2008a and 2008b).

2.2.4 Threat Appraisal

According to Fugate et al. (2012), when an employee is faced with an episode of organisational change they will appraise the threat that such change poses to their interests. The concept can be broken down to the judgement made by the individual when faced with hope of gain versus fear of loss. An understanding of employee threat appraisal may allow managers to appreciate and anticipate threat anxiety in employees; this can then be managed through a process of two way communication that may positively influence employee behaviour. This may also be a way for managers to ameliorate the effects of wider contextual issues which are beyond the influence of the organisation. If unaddressed the effects of employee threat appraisal may result in negative outcomes for the employee and the organisation. These may be manifested as the withdrawal of discretionary effort, absenteeism, and, ultimately departure.

Fugate et al. (2012) suggest that the perceived level of control over their situation that an employee has will have a direct bearing on how they recognise and manage threat anxiety. This control perception is a major factor in deciding if they see the change in a positive or a negative light. This is explained by two factors: the inherent personal traits of the employee; and the situational and emotional state of the employee (Fugate et al. 2012). While an employee's traits are fixed and stable, their state is constantly in

flux and is influenced by social, personal, and contextual factors - all of which can be positively or adversely influenced by the organisation's change management strategy (Fugate et al 2012).

2.2.5 Organisational Learning

The area of organisational learning and the exchange of knowledge is a key component of a Lean organisation and is an aspect of any cycle of change. Organisational learning may be viewed as any opportunity within an organisation where skills are learned or knowledge is exchanged. Organisations that seek to implement Lean must view organisational learning as a value-added activity that is part of a continual knowledge feedback loop rather than a process to be completed before work begins. Learning within a Lean organisation may be considered as the process of discovering error, correcting error, and ensuring that the error is not repeated (Argyris and Schön, 1978; Bicheno and Holweg, 2009).

This aligns with the Lean principles of adding value while removing waste and defects through continual improvement. In the context of the employee's experience of Lean, the use of such tools as the Deming cycle of plan, do, check, act (PDCA) would indicate the presence of double-loop learning and employee engagement. This is an indicator that the employee involvement is based on a bottom-up as well as a top-down implementation of Lean practice. Without such a mechanism as PDCA and other employee feedback channels the workers can have no way of influencing how Lean affects their job quality and ultimately their well-being (Ohno, 1978; Bicheno and Holweg, 2009). Senge (2006) asserts that the characteristics of an organisation that values learning is one where the people are supported and encouraged towards learning and developing on a personal and professional level to the benefit of all.

2.2.6 Respect for People

According to Ohno (1988) people are at the heart of the Lean philosophy and this is enunciated as the ‘respect for people’ principle, a core and guiding principle of Lean philosophy. This attitude to the human dimension is a fundamental principle at Toyota, an exemplar of Lean production. In the TPS the respect for people principle is given equal consideration to all the other Lean principles such as flow, pull, and the elimination of waste. The respect for people principle is based on worker input into work structure, planning, problem-solving, and intrinsic motivation (Ohno 1988; Emiliani, 2008a and 2008b). However, it is precisely how organisations interpret the ‘respect for people’ aspect of Lean that may affect the employee experience of Lean. Thus the employee’s experience of the Lean transformation may spell success or failure for organisational goals. The precise reasons why it is misunderstood are unclear; however it may be due to the effects of ingrained national and institutional cultural influences in organisations (Emiliani 2008 a, and 2008 b).

According to Kim and Chang (2013) organisations introducing Lean practice face problems rooted in employee fear of overwork, role ambiguity, and job security. Unless the organisation completely embraces Lean philosophy, particularly the respect for people principle, and can ensure employees feel valued, empowered, and secure, employee resistance to Lean transformation can be expected (CIPD, 2011; Kim and Chang, 2013). Lean organisations should adopt a flat management structure that leads to open lines of communication throughout the organisation. However communication alone is not enough to ensure employee commitment because employees require training, coaching, and opportunities for personal development to overcome barriers to engagement with the process (CIPD, 2011; Holbeche, 2012).

2.3 The Employee Experience

The employee experience of Lean transformation is a key aspect of the respect for people principle of Lean philosophy (Ohno 1988). The employee experience will affect both the level of engagement that the organisation can expect and the implicit and explicit outcomes that the employees can expect. According to Conti et al (2006)

the employee experience of Lean is a key predictor of the success and sustainability of Lean transformation.

2.3.1 Employee Engagement

According to Angelis et al. (2011) there are two schools of thought on Lean and its effect on workers: one sees Lean as positive and empowering allowing workers to have a positive influence on their job design; however the other perspective views Lean as a method of work intensification achieved through reducing headcount and increasing workload. According to Hasle et al. (2012) there is nothing in the philosophy of Lean practice that is intrinsically unfair to workers. The commitment of employees to the process of Lean transformation is entirely conditional on the approach taken by management when designing and implementing policies and procedures that address their human resources during the Lean transformation. However the experience of Lean for employees is also strongly influenced by the existing working environment, the core competencies of employees and managers, and the organisation's understanding of Lean philosophy (Seppälä and Klemola, 2004; Dahlgaard and Dahlgaard park, 2006; Angelis et al., 2011; Hasle et al., 2012).

According to Womack and Jones (2003), when an organisation adopts Lean philosophy to eliminate waste and add value it is not inevitable that work intensifies and job insecurity increases. Womack and Jones (2003) argue that the objective of a Lean transformation should be to engage the skills, talent, and imagination of the work force to creatively solve problems to continuously improve and grow the business sustainably. This will lead to a more engaged, contented, and productive work force. However, according to Emiliani (2008b) the ideal state of Lean as practised in Japanese companies is rarely found in the West. It is suggested that western companies misunderstand or ignore the human aspect of Lean and only adopt the process-driven improvements that lead to work intensification and employee resistance. Womack et al. (2007) suggest that Lean production, lacking the personnel and inventory buffers of mass production, can result in work intensification; however this can be avoided when a properly constructed and managed Lean process replaces the stress of mass production with the challenges of creative problem-solving.

Empirical evidence of the effects of Lean on employees has shown no clear consensus. According to Parker (2003), and Carter et al. (2011 and 2013), studies have shown that Lean is negative for employees. They hold that Lean is a variant of Taylorism that undermines employee wellbeing due to a reduction in job quality and work intensification. Studies by Angelis et al. (2011), and Bhasin (2012), found that Lean is neutral in its effects on outcomes for workers and is entirely conditional organisational context, management competencies, and human resource policies. A paper by Conti et al. (2006) found that, while Lean is not inherently stressful, the levels of stress reported by workers are directly related to management competency. Johnstone et al. (2011) concluded that workers engaged in a Lean transformation reported increased role autonomy and an improved working environment. However, all the studies have identified management structure, culture, and competency as being closely related to employee outcomes.

2.3.2 The Psychological Contract

The concept of the psychological contract can be understood as the set of unwritten and normally unarticulated mutual expectations and obligations that mediate the employer-employee relationship (Schien 1970; Armstrong 2012). In a Lean transformation, the changes demanded of employees may be well within the explicit terms of the employment contract. However, unless management are aware of the psychological implications of the increased commitment and extra effort required of employees may not be supported by the psychological contract between the employee and the organisation (Emiliani 2008; Armstrong 2012).

Table 2.4: The Psychological Contract

Characteristics of the Psychological Contract	
Employee Expectations	Employer Expectations
How they are treated in terms of fairness, equity, and consistency.	Competence and capability.
Security of Employment.	That employees will perform all the tasks (explicit and implicit) in their job description through both directed and discretionary effort.
Scope to demonstrate competence.	Compliance and alignment with organisational objectives;
Career expectations and the opportunity to develop skills.	Commitment and loyalty.
Involvement and influence	Flexibility and cooperation.
Trust in the management of the organisation to keep their promises.	Trust in employees to honour their obligations.
Adapted from Armstrong (2012; 408-409)	

According to Snape and Redman (2010) the explicit terms of a contract of employment can be understood as an agreement of economic exchange. The organisation buys the services of the employee for a negotiated sum of money and an agreed set of terms and conditions. The purpose of the employment and the behaviours accepted are outlined in the set of documents that constitute the written contract of employment. These documents lay down the minimum standards to be adhered to in order to ensure continued employment. Social exchange theory addresses the discretionary dimension to the employee-employer relationship. This is the unwritten psychological contract where reciprocal issues such as fairness, justice, recognition, and, consultation will decide whether employees will go beyond the minimum effort specified in the employment contract in order to support organisational objectives (Emiliani 2008; Armstrong 2012).

2.3.3 Lean Job Design

According to Conti et al. (2006) job design that conforms to Lean doctrine has several characteristics such as work intensity, the de-skilling of production tasks, and the loss of control due to focused process refinements that could increase employee stress. However, these are ameliorated by the reduction of rework through defect control, the benefit of pulled inventory, and the challenges and sense of achievement offered by creative problem-solving. Womack et al. (2007) point out that, because Lean production lacks the personnel and inventory buffers of mass production, workers in a

Lean environment must be committed to and engaged by their work. According to Cullinane et al. (2013) there is a psycho-social tension at the heart of Lean job design. On one side there is role autonomy, variety, skill development and utilisation that have positive outcomes for employees. However, Cullinane (2013) suggests that Lean job design is also prone to work intensification, time stress, and role confusion - factors which result in negative effects on employees. Many empirical studies suggest that Lean results in negative outcomes for employees, but that in spite of this it may be possible to design a Lean transformation that ensures positive employee outcomes through supportive policies that address psycho-social factors (de Treville and Antonakis, 2006; Hasle, 2010 and 2011).

However Carter et al. (2013) suggest that worker disaffection with the psycho-social aspects of the working environment is unlikely to be central to Lean job design. Apropos of this point, Womack et al. (2007) point out that if organisations approach Lean transformations without reciprocal obligations regarding the psycho-social aspects of work design they are simply running mass production with the slack removed from the system. Table 2.5: Positive and Negative Interpretations of Lean Job Design) sets out the positive and negative aspects of Lean job characteristics. These possible aspects of Lean job characteristics have been extracted from the work of Womack et al.,(1990); Parker (2003); de Treville and Antonakis, (2006); Conti et al., (2006); and Cullinane et al. (2012).

According to Conti et al. (2006: 1017) research studies on the relationship between Lean job design and stress are highly polarised, with opinion clustering at opposite sides of the argument. However when the various issues of Lean job design and worker dissatisfaction are considered, it brings one back to the original TPS understanding of the respect for people principle. The fundamental tenet of this was the degree of worker input into how they were facilitated to creatively solve problems and thus constantly change job design through a continual improvement process (Ohno 1988; Emiliani, 2008 a and 2008 b).

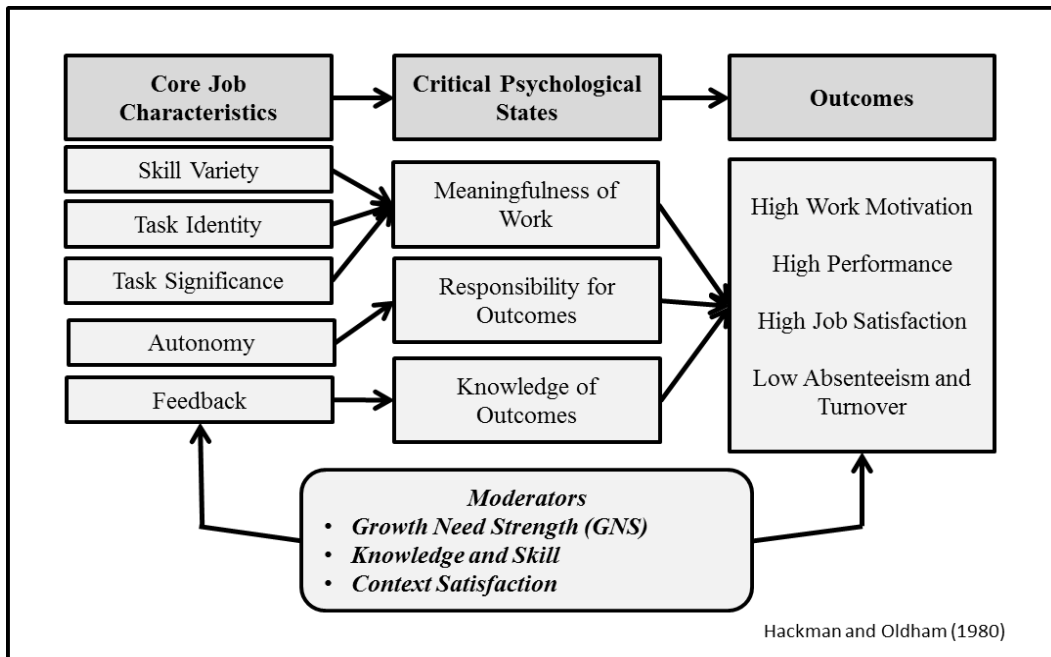
Table 2.5: Positive and Negative Interpretations of Lean Job Design

Positive and Negative Interpretations of Lean Job Characteristics		
Lean Job Characteristics	Positive	Negative
Communication	Accurate feedback	Over accountability
Cross Functional Operations	Skill development Personal development, Career progression	Role confusion Work Intensification
Participation in decision making	Employee empowerment, Increased engagement.	No devolution of decision making Increased responsibility
Problem solving	Challenging and stimulating Increased engagement	Increased responsibility Work Intensification
Respect for People	Open Honest Communication Personal Development	Headcount Reduction Work Intensification
Responsibility for Outcomes	Job definition Increased connectedness Engagement	Increased responsibility Increased risk
Role autonomy	Employee empowerment Increased engagement	Work intensification Task Uncertainty
Skill development	Opportunity to learn Career progression	Work intensification Over specialisation Coercive Obligation
Skill utilization	Challenging and stimulating Job satisfaction	Time stress Work Intensification
Social Support	Group responsibility Improved communication.	Increased monitoring Management by peer pressure
Standard Work	Task definition Defined outcomes	Reduced autonomy Increased responsibility
Teamwork	Social learning Social supports	Management by peer pressure
Transparency	Improved communication Fairness Accountability	Management by data One way transparency
Waste Reduction	Improved job content Involvement in job design	Job insecurity Work Intensification Increased responsibility
Work variety	Challenging and stimulating Career progression	Role confusion Work Intensification
Adapted from Womack et al. (1990); Parker (2003); de Treville and Antonakis (2006); Conti et al. (2006); Cullinane et al. (2012)		

2.3.4 Job Characteristics Model

The job characteristic model (JCM), developed by Hackman and Oldham (1976) (shown in Figure 2.1: Job Characteristic Model) is designed to evaluate and inform job design. It was designed to give a holistic appreciation of the factors that affect workplace outcome for organisations and their employees.

Figure 2.1: Job Characteristic Model



Core job characteristics are examined under five headings; skill variety, task identity, task significance, autonomy, and feedback. These headings are influenced by moderating factors expressed as personal motivation, context satisfaction, and professional competency.

As shown in Table 2.6: JCM moderating Factors broaden the enquiry to include personal attributes of the individual and their satisfaction with the terms and conditions of employment. According to the JCM the ideal job design would have high levels of variety, defined task parameters, worker autonomy, and feedback loops. This would lead the worker to appreciate the responsibility of the task, and, the value of their work, reinforced by constructive feedback.

Table 2.6: JCM moderating Factors

JCM Moderating Factors	
Moderators	Characteristics
Growth need Strength	The level of ambition and the need for personal and professional growth that the individual feels.
Knowledge and Skill	The individual's level of knowledge, skill and competency that allows them to carry out their tasks.
Context Satisfaction	The individual's satisfaction with the extrinsic and intrinsic value of the working environment.
Oldham and Hackman (2010)	

According to Karasek (1979) the individual's experience of the working environment is dependent on the balance between the demands of the job and the level of control they exercise over the demand intensity. Karasek (1979) posited that there is a direct relationship between demand, intensity, and, control, and the level of the stress experienced by the worker. Factors identified as typical of a high stress work environment are; fixed process and scheduling, hierarchical decision making, and the suppression of personal initiative. However, when the worker is involved in the design and improvement of the work process the level of negative stress decreases, until it inverts and the stress becomes a positive trigger for innovation, process improvement and personal development (Karasek 1979). It is suggested that job design rooted in this approach combined with an appreciation of intrinsic and extrinsic motivators should result in a more satisfied, committed and effective worker (Hackman and Oldham, 1976; Oldham and Hackman 2010).

The ideal state for both the Karasek (1979) and Oldham and Hackman (2010) approaches to job design would correspond with the characteristics and expected outcomes of properly interpreted Lean job design as espoused by Womack et al. (1990); Parker (2003); de Treville and Antonakis (2006); Conti et al. (2006); and Cullinane et al. (2012). To illustrate this Table 2.7:Lean Job Characteristics and JCM) exhibits the intersecting commonalities between Lean job design and JCM theory.

Table 2.7:Lean Job Characteristics and JCM

Matrix of Lean job characteristics and JCM convergence					
Indicative Characteristics	Autonomy	Feedback	Skill Variety	Task Identity	Task Significance
Communication		✓		✓	✓
Cross Functional Operations			✓	✓	✓
Participation in decision making	✓	✓	✓	✓	✓
Problem solving	✓		✓	✓	✓
Respect for People		✓	✓	✓	✓
Responsibility for Outcomes	✓	✓	✓	✓	✓
Role autonomy	✓			✓	✓
Skill development		✓	✓	✓	✓
Skill utilization		✓	✓	✓	✓
Social Support		✓	✓		
Standard Work				✓	✓
Teamwork		✓	✓	✓	✓
Transparency	✓			✓	✓
Waste Reduction		✓	✓		✓
Work variety		✓	✓		✓
Adapted from: Hackman and Oldham (1976); Womack et al. (1990); Parker (2003); de Treville and Antonakis (2006); Conti et al. (2006); Oldham and Hackman (2010); Cullinane et al. (2012).					

2.4 Literature Map of Key Studies

The following table outlines the key studies that have emerged as most germane to the research problem. These studies illustrate the spectrum of empirical findings regarding the effects of Lean transformation on employee outcomes.

Table 2.8: Map of Key Studies

Author/s	Research Topic	Methods	Theory	Sample Details	Findings
Parker (2003)	The effect of Lean production techniques on employee outcomes	Longitudinal quasi-experimental survey	Lean and employee outcomes	368 employees at all levels on a production line in a car assembly plant	Lean has a negative effect on employee outcomes, directly linked to a decline in job characteristics
Seppälä and Klemola (2004)	Employee Perceptions following Lean implementation	Quantitative analysis	Lean and employee outcomes	525 blue and white collar workers in four Lean manufacturers based in Finland.	Combining socio-technical and Lean philosophy has had positive effects on job content and the quality of work. However, the removal of buffers in the system can cause employees to feel stressed.
Conti et al. (2006)	The relationship between Lean Production and worker job stress	Questionnaires, interviews and structured plant tours.	Karasek job stress model	1,391 worker responses at 21 manufacturing sites in four UK industry sectors.	Lean production is not inherently stressful, with stress levels significantly related to management decisions in designing and operating Lean systems
Seddon and Caulkin (2007)	The relationship between systems thinking and Lean	Qualitative review of two case studies	Systems thinking	Case studies of one administrative and one social care organisation	Successful Lean outcomes require application of systems thinking supported by leadership and organisational learning.

Author/s	Research Topic	Methods	Theory	Sample Details	Findings
Stewart et al. (2010)	Workers' Experiences of Lean and High Performance Workplaces	Mixed method case study of manufacturers in the UK and Italy	Lean and employee outcomes	Representative sample of shop floor, engineering, and support staff	Regardless of educational attainment Lean equals role degradation and work intensification
Carter et al. (2011)	workers experiences of implementation of Lean	Quantitative, using questionnaires and interviews	Lean and employee outcomes	Representative sample of managers and front-line workers at HMRC	For employees, Lean is a variation of Taylorism. Significant reporting of work intensification
Angelis et al. (2011)	The relationship between Lean implementation and worker commitment	Quantitative, using questionnaires	Lean and work practices	1,391 workers out of 2555 surveyed at 21 Lean sites	Lean is neutral for affective commitment, it is dependent on management design of Lean and HR practices
Johnstone et al. (2011)	principles and benefits of Lean sigma in a drug discovery environment	Electronic survey conducted in 2006, 2008, and 2009	Change management / Lean implementation	Employees at a UK pharmaceutical research and development facility (Astra Zeneca)	Workers reported an improved working environment, which created the time for them to investigate new technologies
Bhasin (2012)	Explore the importance of change strategy to predict the success of Lean implementation.	Semi structured interviews, cross sectional survey and Lean audits	Lean change management	68 questionnaires. Seven case studies. Lean audits out in 20 companies	There is no one size fits all version of Lean. The effort required can result In work overload.

Author/s	Research Topic	Methods	Theory	Sample Details	Findings
Hasle et al. (2012)	Relationship between Lean and the working environment	Literature Review of 11 quantitative studies	Lean and employee outcomes	Review of 11 quantitative studies on Lean on worker health and wellbeing	Although Lean tends to have a negative impact on employees engaged in manual assembly work, positive effects have also been demonstrated
Carter et al. (2013)	employee experience of Lean working employee wellbeing	mixed methods, semi-structured interviews and questionnaires	Lean and employee outcomes	1650 questionnaires. Response rate 51 per cent	The implementation of Lean caused negative psycho-social outcomes and increased occupational sickness rates.
Cullinane et al. (2013)	Understanding the employee experience of Lean work	Literature review	job characteristics model and the job demands–resources model	Review of literature	Lean is neutral in predicting psycho-social stress for employees. The organisation must fully resource their employee’s psycho-social needs to avoid management by stress.

2.5 Literature Review Conclusion

Lean can best be understood as a socio-technical system wherein technical aspects of a process are integrated with the social processes and human elements to achieve organisational goals (Womack and Jones 2003; Seddon and Caulkin, 2007; Bicheno and Holweg, 2009). From an employee perspective the socio-technical nature of Lean is evident in the importance of psycho-social aspects of job and work design (Ohno, 1988; Womack et al., 2009; Bicheno and Holweg, 2009; Carter et al., 2013). Because Lean is a system, any failure of Lean must be seen as a system failure somewhere along the socio-technical axis (Seddon and Caulkin, 2007; Mann, 2012). The reasons for negative Lean outcomes are unclear; however according to Mann (2012) culture is suspect, while Bicheno and Holweg (2009) suggest that the process, not the people, is the likely culprit. However the system laws of Senge (2006) demonstrate that the socio-technical nature of Lean philosophy means that any organisation that seeks to embark on a Lean transformation must pay heed to the people as well as to the process. This suggests that organisations must take a long-term view of both the implementation and the benefits of the Lean journey (Bicheno and Holweg, 2009; Tracey and Flinchbaugh, 2011). It is a matter of debate as to whether Western organisations are in a position, or have the cultural orientation, to make the investment in people that may not yield sufficient short-term gains to justify it (Emiliani, 2008a and 2008b). It is noteworthy that Hasle et al. (2011) have outlined a theoretical approach demonstrating that a properly resourced and constructed Lean transformation can yield positive outcomes for an organisation and its people.

The areas of respect for people, Lean job design, and the employee experience are interrelated and are paramount to employee outcomes (Ohno, 1988; Emiliani, 2008; Kim and Chang, 2013). Employee engagement and commitment to organisational goals is fundamental to the success of a Lean transformation. However the ability of organisations to increase flow, remove waste, and provide value to the customer without eroding the quality of the employee experience is questioned by empirical studies (Parker, 2003; Carter et al., 2011 and 2013). According to Conti et al. (2006), although Lean as a philosophical approach is neutral for worker stress it has intrinsic characteristics that, depending on management competencies, may result in increased stress for employees. Other papers, notably Angelis et al. (2011) and Johnstone et al.

(2011), show neutral or positive outcomes for employees, while Hasle (2010) suggests that a Lean implementation that addresses psycho-social factors and incorporates the necessary supports for employees can result in an effective and lasting transformation. an employee supportive approach the psycho-social factors can lead to a win-win outcome. However, a common thread of opinion directly relates employee outcomes to cultural context, and the competency of organisational management.

The literature reviewed has revealed organisations and their relationships with employee experiences as being complex and challenging. The review of literature has revealed the employee experience of Lean transformation to be a contentious area and has reinforced the opinion that the area of the employee experience within a Lean organisation is an area worthy of research and further investigation.

3 CHAPTER 3 RESEARCH METHODOLOGY

3.1 Chapter Introduction

This chapter will begin by defining the research gap identified from the literature review and will articulate and justify the research question that has emerged from consideration of the identified research gap, and the objectives of the research will be stated.

The theoretical and practical basis of the research design and the reasons underpinning the choice of design will be explained. The method selected, and the reasons for that selection for conducting the research will be outlined and justified. The key elements of the data analysis method will be described and the limitation of the research will be considered. The chapter will close with a short conclusion.

3.2 Research Problem

A view is taken by some authors that that Lean is hostile to the psycho-social needs of employees and that it inevitably leads to work intensification, resulting in reduced job satisfaction outcomes and worker disengagement (Parker 2003; Stewart et al. 2010; Carter et al 2012; 2013). Others see Lean as affectively neutral with outcomes wholly dependent on management style, they posit that social and cultural reasons lie behind a lack of understanding of the respect for people principle. It is offered that this is responsible for the basic misunderstanding of Lean principles with negative consequences for employees (Conti et al. 2006; Seddon and Caulkin 2007; Angelis et al. 2011; Bhasin 2011). While there are studies that see Lean as wholly positive for employees, they are fewer and less strident than the negative view (Seppälä and Klemola 2004; Johnstone et al. 2011; Hasle et al. 2012).

Of the positive opinions, the Johnstone et al. (2011) findings stand-out as they are almost wholly positive, reporting improved working experiences for research and development employees at pharmaceutical manufacturer Astra Zeneca UK. However, Cullinane et al (2013) suggests a complex and contingent tension underlies the employees' experience of job design in a Lean environment.

3.2.1 Research Gap

The research gap identified for investigation is what if any is the effect of Lean on job quality outcomes for laboratory employees whose educational attainment and the nature of their work are seen as inherently high quality. There is evidence that the psycho-social aspect of job design is damaged by the application of Lean tools, however it is unclear if this is because of, or in spite of, the application of Lean philosophy (Emiliani, 2008; Bicheno and Holweg, 2009, Angelis et al., 2011, Carter et al., 2011, 2013; Cullinane et al. 2013).

3.2.2 Research Question

According to Bryman and Bell (2010,) the research question in a qualitative enquiry can emerge from academic or non-academic sources; and is assessed and refined through the lens of the literature review. (Bryman and Bell, 2010; Hennink et al. 2011, 32).

The title of this research paper is: ‘The effects of an organisation-wide Lean transformation on the employee experience of job quality and associated outcomes: A study of laboratory operatives in Irish-based pharmaceutical manufacturers’. With guidance garnered from the review of literature the research question considered by this dissertation has been formulated as:

‘In an organisation-wide Lean transformation, what were the employees expecting would be the impact of the Lean transformation on their job quality and associated outcomes; and what were the actual effects of the Lean transformation on their job quality and associated outcomes?’

3.3 Research Objectives

The aim of the research is to discover the ‘what, how, and, why’ of the employee experience of the Lean transformation. This can be broken down into a number of primary and secondary objectives as seen in Table 3.1: Research Objectives.

Table 3.1: Research Objectives

Research Objectives
Primary Objectives
To discover what outcomes the organisation expected employees to experience.
To discover what outcomes the employees expected to experience.
To uncover what job quality related outcomes the employees actually experienced during the Lean transformation
Secondary Objectives
To compare the experiences of participants in two separate organisations.
To discover any critical factors that affect employee engagement with the Lean transformation.

From the literature review it was decided that the focus of the research was to investigate the experiences regarding job quality and associated outcomes for Irish based laboratory operatives within the pharmaceutical sector in the context of Lean transformation. The understanding of the employee experience was examined, with particular attention to the effect of management’s implementation of Lean on job quality and associated outcomes. The focus was on the perspectives and opinions of operatives and how they are influenced by management actions.

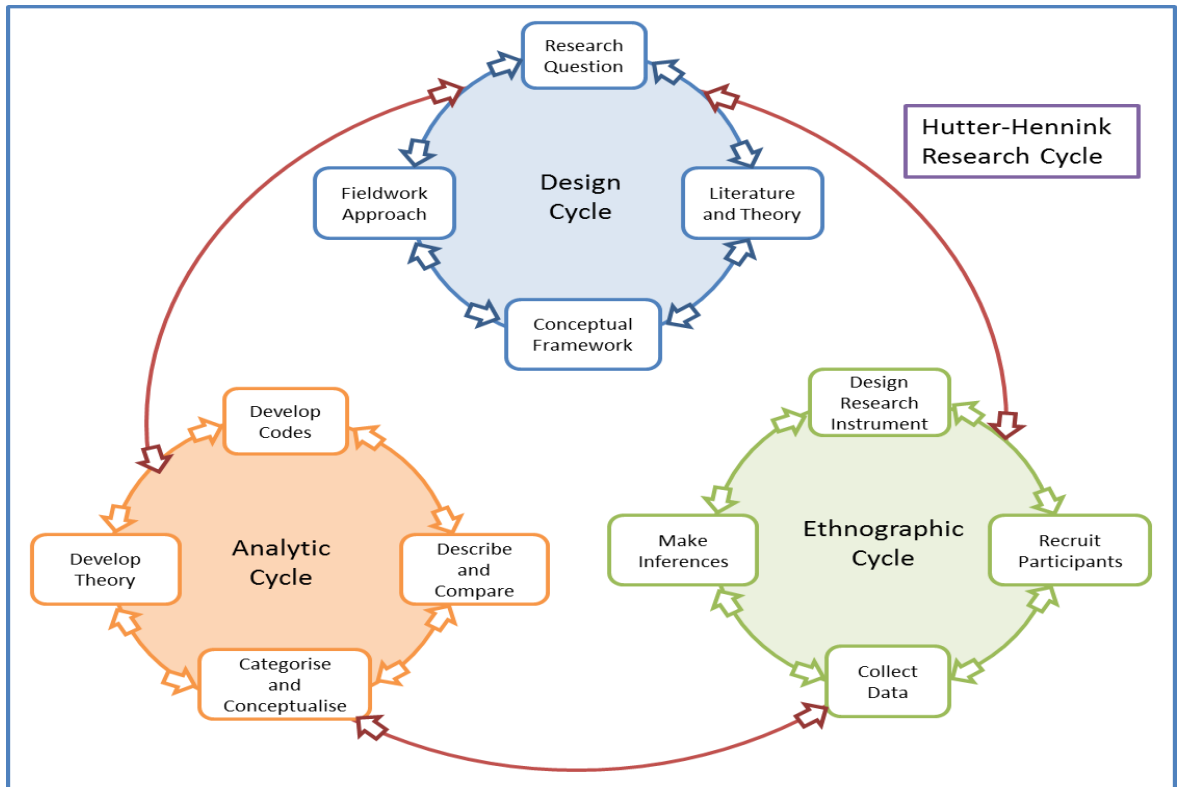
3.4 Research Design

According to Bryman and Bell (2010) research design is the formulation of a plan of operational activity, constructed by the researcher to facilitate the collection and analysis of research data.

Because of the nature of the research question it was decided that that the most appropriate research approach was a qualitative inquiry using grounded theory (Seidel, 1998; Bryman and Bell, 2010; Hennink et al., 2011, Cresswell 2012).

The structure of qualitative enquiry selected for the research design was an iterative and recursive cycle based on the Hutter-Hennink research cycle shown in Figure 3.1. The design model chosen consisted of the three discrete but recursively linked phases of design, data gathering, and data analysis (Hennink et al. 2011).

Figure 3.1: The Hutter Hennink Qualitative Research Cycle



3.5 Research Methods

Research methods are described by Bryman and Bell (2010) as the tactical procedures employed by the researcher when planning and executing the strategic approach formulated during the research design. An outline of the chosen research approach is set out in Table 3.2: Methodological Approach).

Table 3.2: Methodological Approach

Methodological Approach	
Research Approach	Qualitative inquiry.
Theoretical Basis	Grounded theory, inductive and rich in content
Sample population	Management and Laboratory operatives in two Irish Based pharmaceutical organisations.
Sampling strategy	Purposive sampling.
Operationalising	An operational plan was employed to ensure permissions were sought and received in line with all practical and ethical guidelines.
Data Collection	Data will be collected through semi structured interviews
Piloting Plan	Test questionnaire and interviews-End April 2014.
Analysis strategy	Qualitative data analysis using Nvivo©
Ethical Considerations	The research will be conducted in accordance with the WIT ethical policies, procedures, and guidelines.
Research Limitations	Sample size, profile, and strategy may mean the findings cannot be generalised.
Adapted from: Bryman and Bell, (2010); Hennink et al. (2011); Byrne, (2013)	

3.5.1 Qualitative Inquiry

A qualitative inquiry is an inductive method of exploration that is situated in the world that it seeks to explain. This is appropriate when the problem that needs to be explored involves the experiences interactions of a human population (Seidel, 1998; Bryman and Bell, 2010; Hennink et al., 2011, Cresswell 2012).

3.5.2 Grounded Theory

This research project has been conducted as a qualitative enquiry using grounded theory. Grounded theory was formulated by Glaser and Strauss (1967) to describe a process where a continual comparative analysis is the source of emergent theory that will generate hypotheses, leading to development of theory that explains the phenomena under investigation.

As an inductive approach employing thematic analysis grounded theory is suited to a qualitative enquiry involving people and organisations, the use of grounded theory

can capture the complexity inherent in such relationships. (Bryman and Bell, 2010; Hennink et al. 2011; Cresswell 2012; Byrne, 2013).

Table 3.3: The Process of Qualitative Inquiry Using Grounded Theory

The Process of Qualitative Inquiry Using Grounded Theory	
1. Research Question	The researcher begins by formulating an initial research question.
2. Memos	Memos are made throughout the process to record reflections, insights, concepts and categories.
3. Sampling	A selection of individuals/situations relevant to the research question is sampled, (first piloted to refine method and approach).
4. Data Collected	Data is collected from the sample using semi-structured interviews (first piloted to refine method and approach).
5. Coding	Data is coded iteratively, generating further codes and concepts. Continued until saturation is reached.
Steps 1-4 are iterative and recursive, with each step building layers of knowledge and insight through a cycle of investigation and discovery.	
6. Identify relationships	Relationships between categories are established and explored leading to emergent hypotheses.
7. Emergent hypotheses	Hypotheses emerge from the analysed data through displaying, modelling, and interpretation.
8 Test hypotheses	Involves repeating steps 2-5 in the light of the emergent hypotheses. This data is used to test the emergent hypotheses.
9. Generate theory	Using grounded data model and discussion, theory is generated and explained.
Adapted from Bryman and Bell (2010) p.588/9	

3.5.3 Operationalising

Operationalising is the formulation of instruments that will allow the researcher to define the parameters of the inquiry, conduct the inquiry, and, quantify the research outcomes. An operational plan was employed to ensure permissions were sought and received in line with all practical and ethical guidelines (Bryman and Bell 2010; Byrne, S 2013)

3.5.4 Research Instrument

The research instrument chosen as the most suitable for a qualitative inquiry into the research problem was a personal interview. Given the complexity of the issues regarding Lean transformation and employee outcomes, and the possibility of a subjective interpretation of the questions the semi-structured interview was identified

as the most appropriate. Semi-structured interviews have the advantage that while their flexibility presents a rich source of data their structure allows the information gathered to be analysed and presented in a representative and reliable format. The semi structured interview allowed the researcher to vary the sequence of the questions and allowed for particularly interesting avenues of inquiry to be uncovered and explored (Bryman and Bell 2010; Saunders and Lewis 2012; Byrne 2013).

The semi-structured interviews were recorded digitally and contemporaneous verbatim notes were also taken during the interview. This approach was used to ensure that the data presented for analysis was as close to the source as possible (Bryman and Bell 2010).

3.5.5 Interview Questions

The formulation of open questions for the interview was based on themes emergent from the literature review. The characteristics of Lean job design were cross referenced with elements of the job characteristic model (JCM) to measure job content. Management competencies regarding communication, engagement, and respect for people were included. It is to be noted that only elements of the JCM that concerned assessment of employee sentiment were employed as to employ the entire model would be beyond the stated aims of this study (Hackman and Oldham, 1976, 1980; Emiliani 2008; Bicheno and Holweg, 2010; Oldham and Hackman 2010; Tracey and Flinchbaugh 2011 CIPD, 2012).

3.5.6 Sampling

Sampling is a process of selecting subsets of people or organisations from within a larger population. The sample is then used to study the area of interest. The result of the study, if valid, may then be used to generalise the results and apply the conclusions to population they were extracted from (Bryman and Bell 2010; Cresswell 2012).

3.5.7 Sampling Strategy

The sample was selected using non probability purposive sampling strategy, Cresswell (2012) suggests that when conducting a qualitative inquiry it is appropriate to focus in on the individuals, groups and sites that are relevant to the study and that have been identified as those most likely to enable you to understand the area under investigation. According to Bryman and Bell (2010) the study sample can be categorised as a convenience sample in so much as the laboratory employees surveyed were employed by organisations that met the following three conditions:

- They are pharmaceutical companies.
- They employ Lean methodologies and philosophy.
- They are based in Ireland.

3.5.8 Sample Population

The sample population chosen was the subject of two selection parameters. Firstly, the organisations that the participants were employed in had to be pharmaceutical companies based in Ireland. Secondly, those who were to be directly researched were required to be non-managerial operatives working in a laboratory setting in these organisations.

3.5.9 Justification for Selection of Organisations and Participants

The research literature has shown that there is divergent opinion on the benefits of Lean methodology for employees (Angelis et al., 2011; Hasle et al., 2012; Carter et al. 2013). The majority of studies consulted have concentrated on traditional manufacturing or large service providers. However, those that have investigated a narrow subset of employees in the pharmaceutical sector such as Johnstone et al. (2011) have shown positive aspects of Lean for employees. In light of these findings the study seeks to explore the employee experience of Lean transformation in an Irish context. The justification for the selection of participants is to investigate a group of employees that are educated to third level, yet are employed in a non-managerial position within the organisation. This group, employed in the laboratories are likely to

have had a clear experience of any changes in the psycho-social nature of their work. The selection of the organisations is based on the fact that they are well resourced and functioning in a regulated environment, this should ensure that the Lean implementation is less likely derailed by exigent economic shocks.

3.5.10 Piloting Plan

The study was piloted at the beginning of June 2014. The pilot involved interviewing a non-executive laboratory operative in a recognised Lean medical device manufacturer based in the southeast of Ireland. The pilot interview used a selection of open questions that provided information that dictated the formulation of the final suite of themes and questions as recommended by Bryman and Bell (2010). The pilot subject was asked a suite of thirty four questions and their responses were recorded. The data gathered during the pilot was analysed and as a result of the pilot the scope, structure, and timing of the interviews was refined. The broad themes to be investigated were confirmed and placed in a more coherent sequence, some questions were split into two discrete questions while others were combined into one, and others were eliminated as they were found to elicit duplicate answers.

3.5.11 Data Collection

Data collection is the process where the researcher engages in a tested and reliable process to gather the raw data that will allow the empirical exploration of the identified research problem (Bryman and Bell 2010)

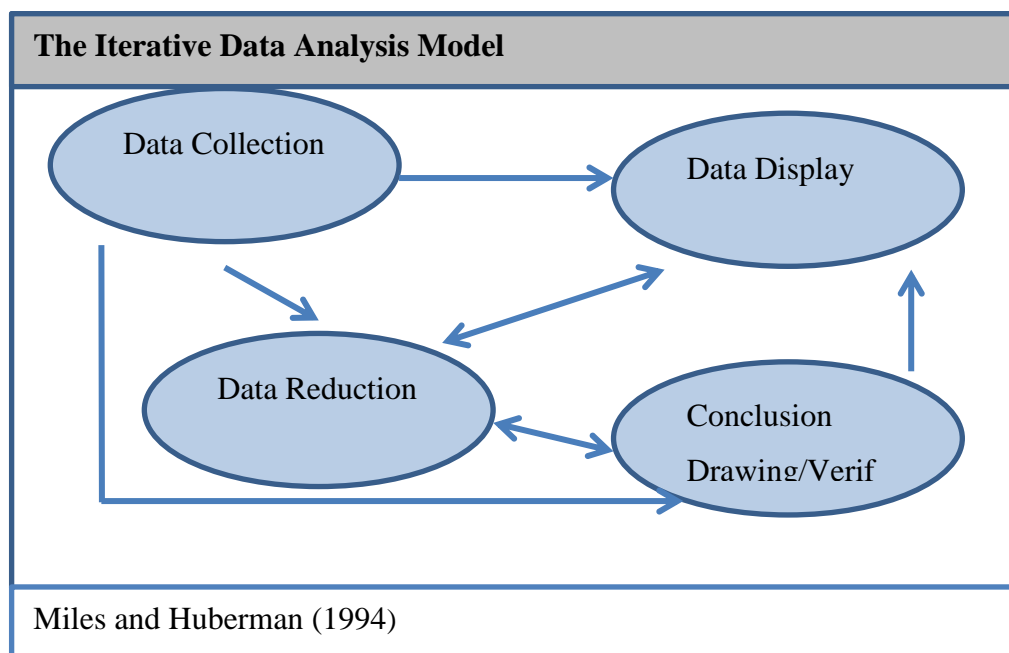
Following the pilot the semi-structured interviews were conducted in late June and early July 2014 at the workplace of the participants. The interviews were recorded electronically and contemporaneous notes were taken. Secondary sources uncovered before during and after the interview process were used to provide context regarding the organisations Lean transformation (Bryman and Bell 2010). The information gathered from the questionnaires were be transcribed using Microsoft Word and analysed qualitatively using Nvivo software (Bryman and Bell 2010; Hennink et al., 2011; Byrne, 2012).

3.5.12 Data Analysis

Qualitative Data Analysis (QDA) is the range of processes whereby the researcher moves from the qualitative data that has been collected into some form of explanation, understanding or interpretation of the people and situations under investigation (Glaser and Strauss 1967; Seidel, 1998; Bryman and Bell, 2010; Hennink et al., 2011).

The process of data analyses employed was based on a grounded theory approach and was adapted from the work of Miles and Huberman (1994); Bryman and Bell (2010); and, Hennink et al. (2011) as outlined in Figure 3.2 and Table 3.4: Stages of Data Analysis).

Figure 3.2: The Iterative Data Analysis Model



In accordance with the recommendation of Miles and Huberman (1984), and Bryman and Bell (2010) the data analysis phase of the research consisted of data reduction, data display, conclusion drawing and verification.

Table 3.4: Stages of Data Analysis

Stages of Data Analysis	
Data Reduction	Selecting, focusing, simplifying, and abstracting to transform raw data.
Data Display	Organising data into models, graphs, networks etc. in order to facilitate conclusion drawing.
Conclusion drawing	Interpreting patterns, relationships, flows which lead to conclusions or further areas of inquiry.
Verification	Testing tentative conclusions for their plausibility and robustness in order to prove validity.
Adapted from: Miles and Huberman (1984)	

Data was analysed using Nvivo, a computer aided qualitative analysis software (CAQDAS) product. The process of coding, central to analysis of qualitative data will be applied to identify themes that will lead to concepts and emergent hypothesis. This process will be recursive until saturation point is reached, Nvivo will assist the process of coding and modelling of the data, however, cognitive decision making associated with data analysis will remain the responsibility of the researcher (Gibbs 2002; King and Horrocks, 2010; Bryman and Bell, 2010; Hutchinson et al., 2010).

3.6 Ethical Implications

The research participant's agreement to engage in the study was secured on an informed and voluntary basis. The organisation was approached and the nature and purpose of the research was fully disclosed. The researcher relied on the organisation to provide access and contact details only. The prospective participants in the study were contacted, and received a written explanation of the studies aims and objectives, and, when they expressed a desire to participate their informed consent was obtained participants were assured that they could withdraw from the study at any time. A copy of the consent form and information can be seen in appendix I.

Confidentiality was maintained for the organisation and all participants, and the identity of participants was never linked to the data derived from their responses. When participants were quoted directly they were assigned a pseudonym to assure their anonymity. Likewise the organisations were afforded the cloak of anonymity and

details unnecessary to the academic relevance and rigour of the paper were excluded. Following the data analysis process the raw data has been destroyed.

3.7 Validity and Reliability-

Quantitative data must be representative of the population, statistically valid and quantitatively measurable Information to provide background and context regarding the depth and duration of Lean transformation was sourced through organisational management and from the participants. The characteristics of the organisations and the participants organisation and the participants were key to ensuring validity and reliability of the sample (Bryman and Bell 2011; Cresswell 2012)

3.8 Limitations

The characteristics of the study related to sample size, profile, and specialised Industry sector may mean that the findings cannot be generalised. The issues of generalizability are also associated more generally with the employment of grounded theory (Bryman and Bell 2010; Cresswell 2012).

3.9 Chapter Conclusion

The chosen theoretical underpinning for this research was grounded theory as developed by Glaser and Strauss (1967). In keeping with the precepts of grounded theory the research element of the project was iterative and recursive, involving discovery, reflection and looped learning at every stage of the process. The methodology outlined was closely followed and all ethical undertakings were honoured.

4 CHAPTER 4 FINDINGS

4.1 Chapter Overview

The purpose of this chapter is to present the primary research findings from the current study. The findings described in this chapter were derived from a suite of six semi structured interviews with non-executive laboratory operatives employed by the Irish based operations of multi-national pharmaceutical manufacturers.

This chapter is divided into three sections. The first section deals with the profile of the research participants and their employer organisations. The second section presents the findings broken into three parts firstly, the employee perception of why the organisation chose to be Lean. Secondly, the employees' perceptions of organisational management of Lean job design. The third part of this section deals with motivating factors and job Satisfaction. The chapter closes with a conclusion section.

4.2 Participant Information

The criteria employed when selecting the participants were that they should be employed in non-executive roles within the laboratory in organisations of a similar size profile, and that the organisations employing them should be based in Ireland, and recognised as employing Lean methodology.

In order to preserve the confidentiality of the participants and the organisations that employ them the participants and the organisations are identified using simple coding. To provide some context to the findings a brief profile of the organisations is given in Table 4.1.

Table 4.1: Organisation Profiles

Organisational Profiles		
Organisation	Number of Employees (*2013 Approx.)	Length of Time Since Adopting Lean Methodology (In excess of.)
‘A’	500	Ten Years
‘B’	500	Seven Years
*Source Irish Times Top 1,000 Irish Companies		

Both participant organisations are well established and profitable sites and are seen as key elements of larger multinational organisations.

Demographic data regarding participants is set out in Table 4.2. Participants are listed in the order in which they were interviewed. Of the six participants three came from Organisation ‘A’ and three came from organisation ‘B’

Table 4.2: Participant Profiles

Participant Profiles					
Participant	Gender	Age Group	Educational Attainment	Length of Service (Years)	Organisation
Participant 1	Female	30-35	BSc	10	‘A’
Participant 2	Female	30-35	Postgrad	8	‘A’
Participant 3	Female	25-30	BSc	6	‘B’
Participant 4	Female	25-30	BSc	4	‘B’
Participant 5	Male	35-40	Hdip	10	‘B’
Participant 6	Male	40-45	PhD	5	‘A’

Interviewees are identified by participant number and the organisations are referred to as either ‘A’ or ‘B’. While the participants in the study were diversified in areas such as age, gender and educational attainment, there were enough commonalities to ensure that the results would be reasonably representative. The participants were all very experienced in the area of regulated pharmaceutical laboratory processes and all had at least five years’ experience of working as a laboratory analyst. This meant they were in a position to supply a sufficient combination of experience and opinion to strengthen the validity of the study.

The findings presented were extrapolated from data gathered through semi-structured interviews and analysed using Nvivo software. The interviews were conducted over a two week period at two sites during June 2014. Each interview lasted approximately one hour and was held in a private room at the organisations premises. Interviews were recorded, and while an interview guide was used the interviewees were free to discuss any item that they felt was relevant to their experience

4.3 Findings

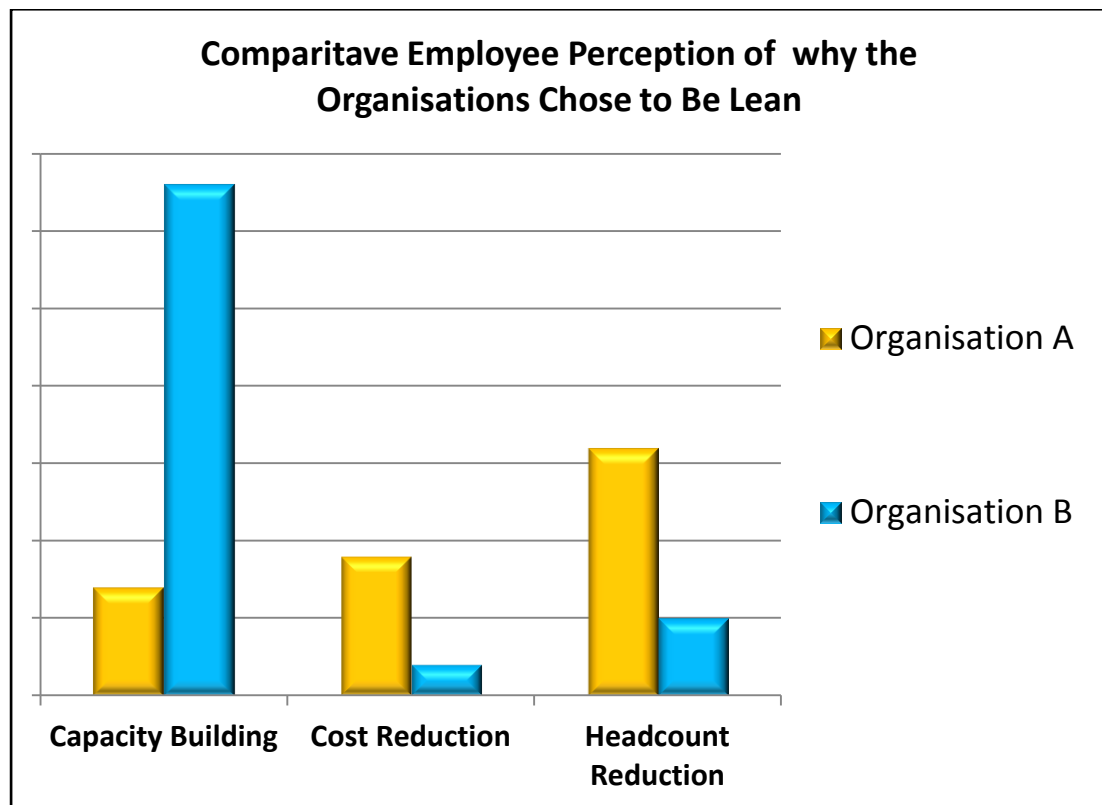
The findings section is set out in three sections that deal with key elements of the research question. The first section deals with the perceptions of the participants as to why their employers have decided to adopt a Lean approach. In effect to discover what outcomes the organisation expected employees to experience, and what outcomes the employees expected to experience. The second section presents the findings connected to the organisational management of Lean job design. These findings relate to the research objective of discovering the reality of the employee experience of Lean transformation. These findings also relate to the contrasting experiences of those employed in separate organisations who have adopted Lean. The final section presents emergent findings regarding the personal motivation of the participants in relation to their attitudes to the organisations' interpretation of Lean job design. The data is presented in consolidated form in charts in order to allow ease of understanding. In keeping with the precepts of qualitative inquiry, the results obtained are comparative and are not measured against a scale. The source data for the all the charts displayed are presented in appendix II.

4.3.1 Employee Perceptions

One of the areas investigated concerned the employees' perceptions of why their organisation chose to be Lean. This area of inquiry was linked to the questions of what the organisation expected the employees to experience and what the employees expected to experience. As shown in Figure 4.1: Employee Perceptions of Why the Organisation Chose to be Lean), it emerged that while neither organisation seemed to have delivered an unambiguous message organisation 'B' had managed to present a scenario where capacity building and job security were the key reasons for adoption

of Lean, and this was predominately viewed as positive and progressive. However the employees of organisation 'B' have a much more fragmented and conflicted idea of why Lean has been adopted. The leading perception in organisation 'B' is that Lean has been introduced to reduce headcount, the view being that Lean was necessary rather than desirable.

Figure 4.1: Employee Perceptions of Why the Organisation Chose to be Lean



The contrasting views can be illustrated by a number of quotations given by participants when asked what they were told to expect and what the experience had delivered.

A participant from organisation 'A' offered this information when asked about organisational expectations:

We did not get a lot of information just an assurance that things would have to change. There was a lot of talk about headcount reduction and “doing more with less”.

Another employee of organisation 'A' put it like this:

When the Lean lab project came [there was a new production line scheduled] we looked to hire ten additional analysts in the lab to meet the targets for the coming year and when we went [looking to recruit] there was a headcount freeze..., no you are not getting anyone else but you still have to deliver on all the projects, so we needed ten but we weren't getting them so how can we do the projects without the ten extra people? So that was our burning platform.

However in a more positive view the same person from organisation 'A' said

So we have a lot of new trial products coming in here and they are much smaller batch sizes and you need to be more flexible in the lab. So what they're saying to the lads in the lab is that there's uncertainty coming over the next few years 'cos of the die off of the patent and new products but there's opportunities there for us to build it for ourselves but it's up to us to show the big wider [corporate] group that we are the place to send the new products to and one of the levers for doing that for us will be Lean.

The information given to employees of organisation 'B' was different. One participant related the following as what the organisation related to them:

[What were you specifically told what it meant for the organisation?] Yeah like there is the monetary value of it, capacity plan, there's yield there's a number of different efficiencies, and even for people to work in a more structured environment usually means a better

area to work in. We were told that we would have input and support of Lean coaches and training as the Lean stuff was rolled out, there was a lot of communication all the time from the senior management down to the team meetings every week

While the same employee from organisation 'B' articulated their experience of Lean as:

We are building capacity but it is not being filled by more of the same work it is being filled with different work that is more mentally challenging more stimulating and brings more opportunity to further your development, I sound like a textbook now, I know it does

This positive view of the experience of Lean as building capacity was echoed in the comment of another organisation 'B' employee:

My job became more interesting and challenging and the dimensions of the job got wider, I got to understand more of what goes on all around, and what people think about the process and how they can bring in brilliant changes and improvements.

The findings from this section show that there was a marked difference in how the employees from each organisation perceived their respective organisation's reasons for choosing Lean. While both organisations did refer to capacity building when introducing Lean the employees from organisation 'A' did not find that the espoused objectives matched with their experience. However, with the employees of organisation 'B' a much closer correlation exists between the stated management objectives and the employees' realisation of those objectives.

4.3.2 Organisational Management of Lean Job Design

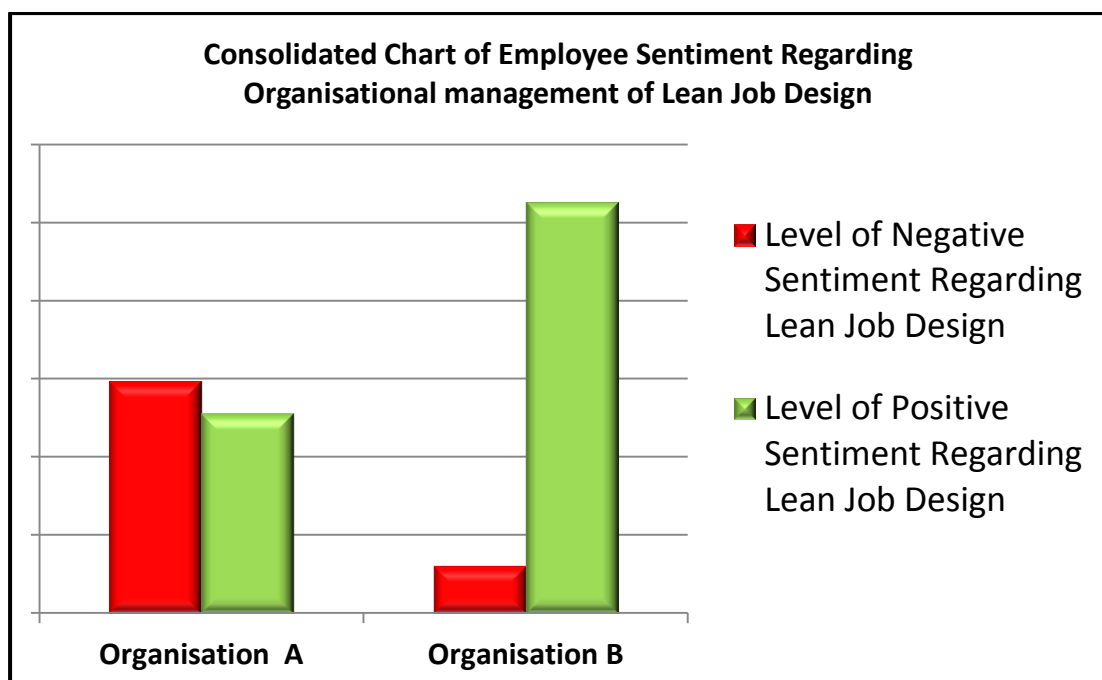
It was established in the review of literature that there are certain characteristics that mark out Lean job design, furthermore these characteristic can have positive or negative consequences for employees depending on how each characteristic is managed. The Lean job characteristics that informed the analysis are set out in Table 4.3: Lean Job Characteristics; which will put into context the findings relating to employee sentiment displayed in Figure 4.2: Consolidated Table of Employee Sentiment (the positive and negative aspects of Lean job design are set out in Table 2.5 in the literature review chapter).

Table 4.3: Lean Job Characteristics

Lean Job Characteristics		
Communication	Responsibility for Outcomes	Standard Work
Cross Functional Operations	Role autonomy	Teamwork
Participation in decision making	Skill development	Transparency
Problem solving	Skill utilization	Waste Reduction
Respect for People	Social Support	Work variety
Adapted from: Womack et al.,(1990); Parker (2003); de Treville and Antonakis, (2006); Cullinane et al. (2012)		

Figure 4.2 shows the employees' sentiments regarding how their organisations have managed job content and work design. The data was gathered and analysed using themes based on the characteristics set out in Table 4.3.

Figure 4.2: Consolidated Table of Employee Sentiment



The level of analysis can be seen on the original non-consolidated findings chart in appendix II. This chart lists all of the Lean job characteristics and the positive and negative sentiment expressed against each one by the employees of both organisation 'A' and 'B' respectively.

As is evident from Figure 4.2 the employees of organisation 'B' had a much more positive view of the organisations management of job content and work design than those at organisation A. This was also reflected in the comparison of negative perceptions, with employees of organisation 'B' having a much smaller amount of negative opinion when compared to those from organisation 'A'. Areas of particular concern to employees of both organisations were concentrated around workload management, job security, career progression, and communication. These came together in the area of 'respect for people' where employees from organisation 'A' showed the greatest level of negative sentiment, while those from organisation 'B' showed the greatest level of positive sentiment.

The area of work intensification and headcount reduction is to the fore when a participant from organisation 'A' said:

It [Lean] is espoused to the people at ground level that it will make their job easier, there is no discussion of if your job is easier you can do it faster and therefore we need less of you, I don't think people have thought that one through necessarily otherwise I don't think that the change would have been embraced as rapidly.

However on the positive side looking at it from a perspective of capacity building a participant from organisation 'B' said:

It is absolutely [about building capacity], but it is very busy, we are building capacity but it is not being filled by more of the same work it is being filled with different work that is more mentally challenging more stimulating and brings more opportunity to further your development, I sound like a textbook now, I know it does

Addressing the experience of work for their colleagues which correlates with the respect for people principle of Lean a participant from organisation 'B' When asked about the Lean aspect of their job was of the opinion that:

Basically what I do is I work in a role where I try to make the environment of the lab more efficient and cost effective and I suppose pleasant for everyone involved. Taking in to account the people in the lab because I have worked in their for years

One participant from organisation 'B' made a very interesting observation regarding the definition of waste and respect for people when they said:

We have a standardised cycle time now 21 days and we are in a position to do this, if we delve too deeply and say I reckon we can get it down to 18 days. But is it value added to do it are you going to lose experienced people, are people just, you know you can only push people to a certain extent before they will leave.

This could be directly related to the 'respect for people' element of Lean philosophy.

The results shown in Figure 4.2 are comparative and are not measured against a scale. However given the similarities between the participant's roles and demographic data the differences in opinion are noteworthy.

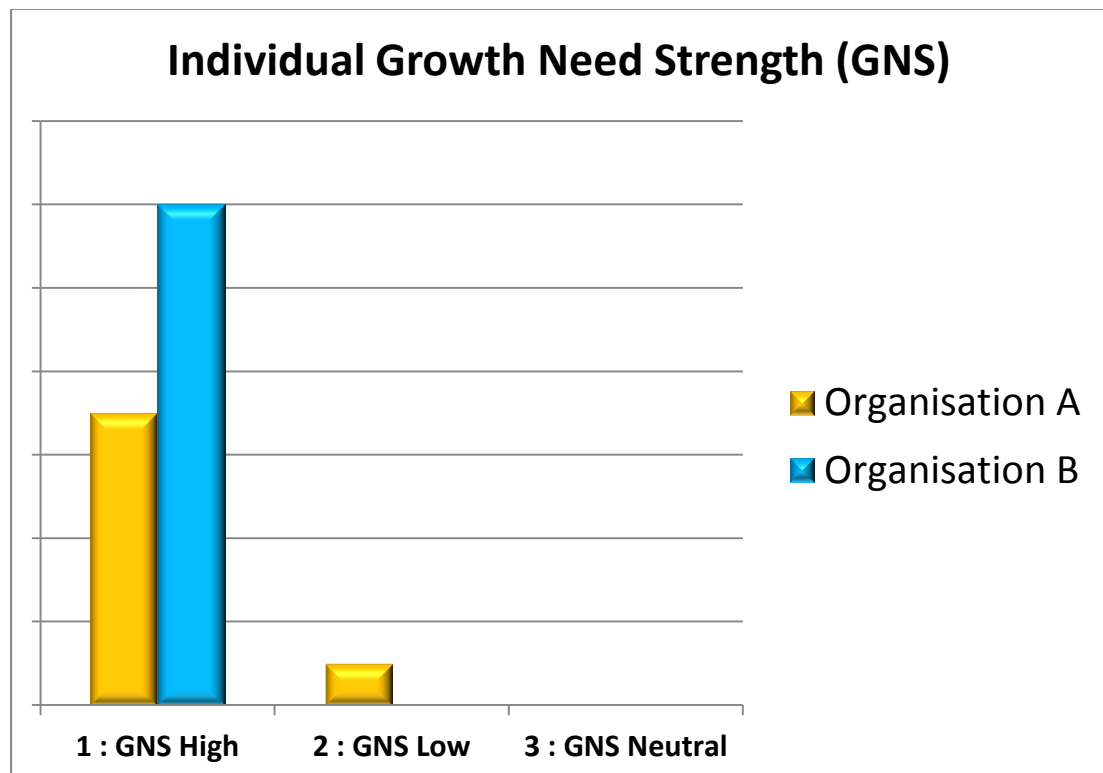
4.3.3 Motivating Factors and Job Satisfaction

When analysing the data the issue of personal motivating factors emerged as a finding. The data was parsed under three themes as set out in Table 4.4 and is expressed in four discrete charts.

Table 4.4: Individual Moderating Factors

Moderators	Characteristics
Growth need Strength	The level of ambition and the need for personal and professional growth that the individual feels.
Knowledge and Skill	The individual's level of knowledge, skill and competency that allows them to carry out their tasks.
Context Satisfaction	The individual's satisfaction with the extrinsic and intrinsic value of the working environment.
Oldham and Hackman (2010)	

Figure 4.3 Individual Growth Need Strength



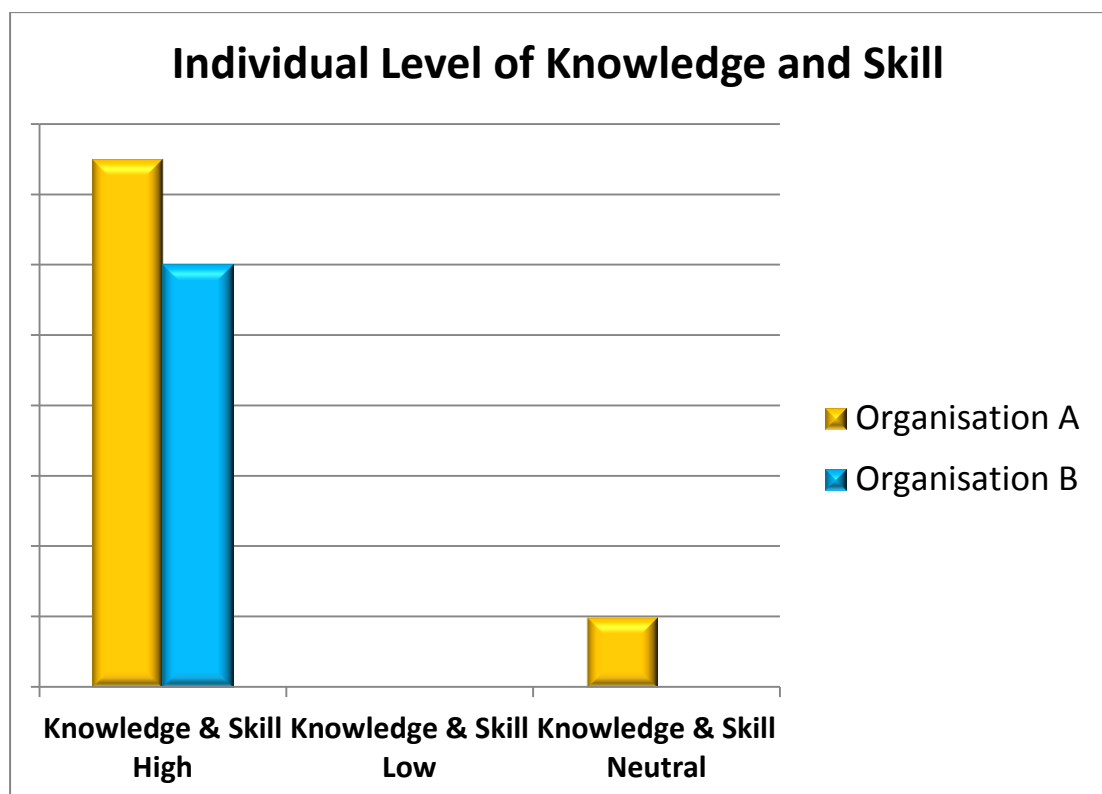
The majority of interviewees indicated they had a high level of growth need strength. An exception was a participant from organisation ‘A’ who said:

Ten Years in the same role here in, plus I did the same job before I came here for three and a half years. No I don’t see myself as ambitious. I don’t think so, I would be ambitious in what I do, in my role, I am able to do it well.

More typical of the responses related to growth and ambition was the personal opinion of another participant from organisation ‘A’

I am very much driven by learning new things, If I find that am in a position where personal development does not occur I will move on, I am very driven by not necessarily reaching the upper echelons but definitely by self-improvement

Figure 4.4: Individual Level of Knowledge and Skill



The level of knowledge and skill possessed by all participants was high. This is correlated by academic qualification, stated competency, and length of service within the organisation. It is worth noting here that participants from organisation 'A' returned a more positive appreciation of their ability to do their jobs than those in organisation 'B'.

The area of context satisfaction returned some strong opinions and the difference in sentiment between organisations 'A' and 'B' is stark. This is reflected in a statement by a participant from organisation 'A' who explains their recent decision to leave:

[Organisation 'A'] do not operate a time in lieu policy and that was my primary decision to leave and go to [named multinational company] where a time in lieu policy operates to allow you to come in early or stay late. Because CI [continual improvement] demands flexibility because of the reduced people resource I was working excessive hours with no money or time off compensation so I decided to go to an organisation that does allow it. I am moving for what are better conditions and better pay

In contrast another participant from organisation 'A' was more satisfied with the context of their employment although the salary and benefits were an issue:

[In relation to salary] A bit below it, especially if it is a package you are looking at.

However the individual was satisfied with the role variety offered by Lean.

For me, I mean I am a microbiologist but I have been working as the Lean lab lead person for the last year and there is new opportunities coming up for me all the time now.

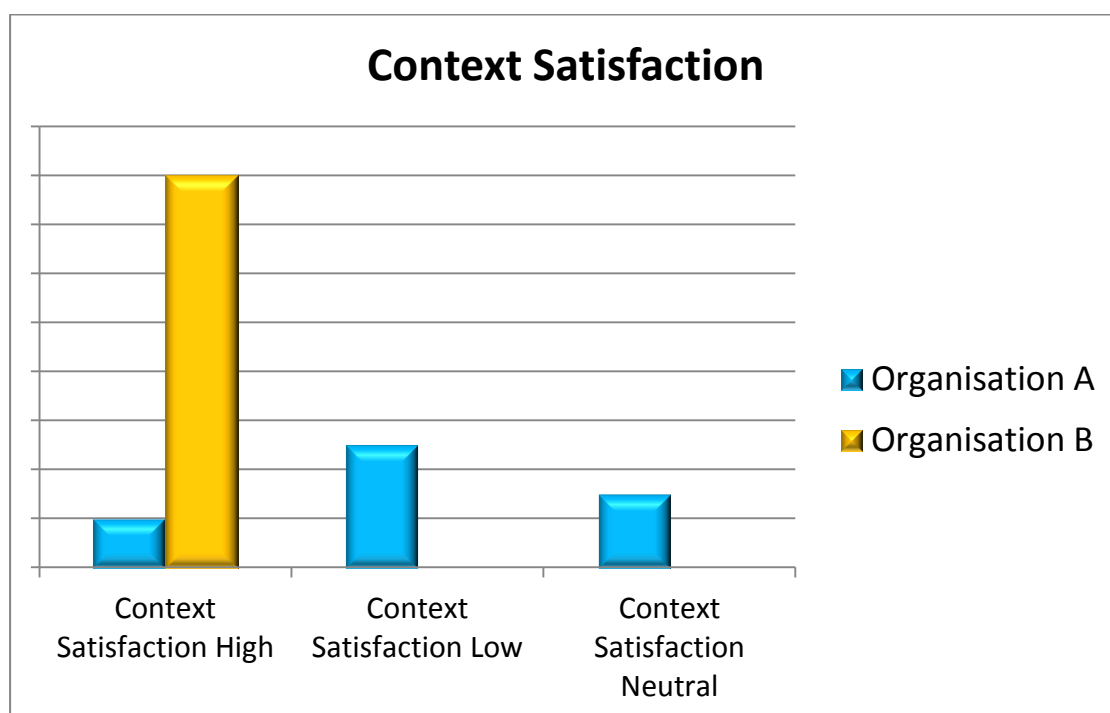
The level of context satisfaction was universal in organisation 'B' where salary, benefits, and the working environment all receiving positive commentary. The following are quotations from all three organisation 'B' employees in areas of salary and benefits, job security, and, engagement with the job:

[Salary] Pretty much on par – industry standard, package and benefits are good.

[Job security] Very secure, it's a very busy company there is a lot going on I can't envisage any issues. No we have a lot of products coming on and there are a lot of projects coming on, the company plan goes up to 2020. There is also very good visibility of and on that plan.

[Engagement] I do enjoy my job I don't see it as a chore I come to work and I enjoy it. The Lean processes are very much a big part of that, I mean it's great to work on something you are very interested in. work doesn't seem like work

Figure 4.5: Context Satisfaction



The findings on context satisfaction would seem to show a gap between the experiences of those from organisation ‘A’ and those from organisation ‘B’. When the similarities in growth need and knowledge and skill are considered it would seem that the area that divides the experiences of both sets of participants is the area of context.

All of the source material generated during the data analysis using Nvivo is contained within appendix II

4.4 Chapter Conclusion

The areas that were defined as the focus of this enquiry have been addressed by the above findings. In the area of what the organisation expected the employees to experience, it is apparent that in organisation ‘A’ the message and the espoused expectations were inconsistent and thus the employees interpretation the expected outcomes were fragmented and the sentiment generated is generally negative. In organisation ‘B’ a clearer more orchestrated message backed up by support and resourcing has led to a generally positive attitude to the adoption and development of Lean.

What the employees expected to experience was subjective. It was influenced both by the words and deeds of the organisation and conditional on the individuals experience and attitude. Those in organisation 'A' had experience of previous attempts to introduce Lean that had not been sustained, and were also wary of the reasons behind the application of Lean. Employees of organisation 'B' had a much closer correlation between what the organisation told them they would experience and what they thought they would experience.

The employee's expectations in both organisations were generally reflected in their actual experience of the Lean transformation

Only the participant from organisation 'A' who had embraced Lean through further education was reasonably positive about the effects of Lean while their colleagues were negative or ambivalent. In organisation 'B' the sentiment was predominately positive, however there were some concerns regarding overwork and the lack of headcount resources when the system became stressed.

The findings have also parsed the separate attributes and experiences of employees from two different organisations and discovered commonality and divergence. In particular, participants from both organisations voiced concerns regarding stress on the system and the danger of overwork. However, while participants from organisation 'A' saw this as an intended consequence of adopting Lean the participants from organisation 'B' took a more nuanced view and believed that they were empowered sufficiently to push back on this.

These findings will be discussed with reference to literature and theory in the next chapter.

5 CHAPTER 5 DISCUSSION

5.1 Introduction

This chapter will discuss the findings outlined in the previous chapter. The findings will be deliberated in two broad areas, firstly the question of the meaning of the findings will be discussed, then the findings will be examined against the themes and concepts identified in the literature review in order to discover divergence, convergence, or departure from the relevant theories.

It is important to be cognisant of the context and subsequent limitations of the research the small sample size and the restriction of the study to laboratory operatives in pharmaceutical companies compromises generalisability. However, the research design was robust and the discussion of the findings should be considered valid within the confines of the stated objectives.

5.2 What the findings Mean

The study has been designed and constructed with regard to the research objectives and the theories of Lean, Lean job design and the interpretation of job quality. Thus the meaning of the findings will be discussed in relation to those themes and to the literature pertaining to them.

5.2.1 Finding 1: Employee Perceptions.

The findings related to employee perceptions take in the research objectives of what the organisation said Lean would mean for employees, and, what the employees thought Lean would mean for them.

The area of employee perceptions of why the organisation chose to pursue a Lean transformation threw up divergent findings between those employed in organisation 'A' and organisation 'B'. These results indicate that the employees of organisation

‘A’ believe that their organisation want the cut costs and reduce headcount while those in organisation ‘B’ believe it is a strategy to build capacity to sustain growth. This would align organisation ‘B’ with the literature that sees Lean as a holistic philosophy for removing waste to build capacity and deliver value to the customer (Seddon and Caulkin, 2007; Bicheno and Holweg, 2009; Hasle 2012). Organisation ‘A’ on the other hand may be using Lean as a toolbox to address cost reduction. According to Bhasin and Burcher (2006) this approach cannot sustain long term gains.

It was established that those who participated in the study were broadly similar in profile regarding educational attainment and work experience, with this in mind the explanation for the divergent opinion rests with the organisations initial and ongoing communication coupled with their management of the employees’ experience of work. This interpretation of the findings would be in accordance with Bicheno and Holweg (2009) who suggest that because Lean is a socio-technical system management of the social aspect of Lean transformation is central to the employee experience.

In agreement with the position of Bhasin (2012) and Fugate et al (2012) it is apparent that the employees understanding of and engagement with organisational goals is shaped by the quality and perceived integrity of the words and deeds of management. The actual reason for the organisations adoption of Lean also had an impact on the employees’ attitude. The capacity building strategy espoused by organisation ‘B’ was accepted and engaged with by the employees even when it was accompanied by an overt target of zero increase in headcount. In organisation ‘A’ the capacity building message was inverted and the employees tended to see the Lean transformation in the labs as a precursor to an inevitable intensification of work and a reduction in headcount in order to drive costs down. The findings also indicated that, in the case of organisation ‘A’ previous failed Lean implementations undermine management efforts at engaging employees with subsequent attempts at introducing Lean.

It is probable that both organisations are in different ways subject to the effects of the system laws of Senge (2006) in Bicheno and Holweg (2009) as shown in Table 5.1, page # in the literature review chapter. Organisation ‘A’ is suffering from the law of unintended consequences caused by a pre-determined approach to headcount reduction, whereas organisation ‘B’ is employing a more experimental and incremental approach where emergent strategy is informed by employee participation in the process. This approach is that recommended by Lucey et al. (2005) and Dahlgaard and Dahlgaard Park (2006) who suggest that without a reciprocal cycle of communication, understanding and respect for each other the organisation and the individual will not undertake the Lean journey together

When both organisations findings are considered against the five variables for sustaining Lean transformation developed by Tracey and Finchbaugh (2011) you can see where organisation ‘A’ and ‘B’ diverge when it comes to communication and recognition and reward as shown in Table 5.1. The gaps in communication can be seen to be a critical area for obtaining and sustaining engagement.

Table 5.1: Comparison of strategies for Sustaining Lean

Five Recommendations for Sustaining a Lean Transformation	Organisation ‘A’	Organisation ‘B’
1. Develop teams as a supporting structure of Lean	✓	✓
2. Calculate and Communicate metrics regularly	✓	✓
3. Communication among organisation members, particularly across functions	✗	✓
4. Communication to employees regarding their specific role in the transformation	✗	✓
5. Acknowledgement and celebration of milestones toward Lean transformation targets	✗	✓
Adapted from Tracey and Finchbaugh (2011)		

According to Bicheno and Holweg (2009) and Hines et al. (2011) the competency of line managers to understand and communicate the organisations expectations and obligations are a vital component of successful Lean transformations. While it is clear that the employees in organisation ‘A’ receive information and support from line managers and specialist Lean coaches, the effect of this was to keep their expectations and the organisation expectations aligned. The situation for employees in organisation

‘B’ is unclear with no readily identifiable knowledge support system in place the employees do not know what management expect from the Lean transformation. In the absence of a cogent message the employees will make a value judgement based on their learned experience within the organisation. This idea of threat appraisal as suggested by Fugate et al (2012) would explain how an organisation with unclear expectations and previously unsuccessful attempts at Lean would find it more difficult to engage employees with subsequent efforts. The effects of this can lead to employees becoming disengaged and departing the organisation, this may already be manifesting in organisation ‘A’ as seen in the departure of an employee connected to dissatisfaction with the working environment.

The findings suggest that it is necessary to apprise employees of the conditions that dictate the need for a Lean transformation. To engage the employees the communication of the intended and probable outcomes must be clear, honest, and realistic and the promised outcomes must be supported and honoured. This is where the importance of acknowledging and respecting the psychological contract as shown in table 2.4 is crucial to maintaining trust and affective commitment (Emiliani 2008; Armstrong 2012).

Expecting employees to enter a state of cognitive dissonance where their expectations and their experience do not match up may lead to a dissatisfied and disengaged workforce. This completely undermines the respect for people principle and creates a counterproductive outcome for both employer and the employee (Ohno 1988; Emiliani 2008a and 2008b).

5.2.2 Finding 2: Organisational Management of Lean Job Design

The findings connected to the organisational management of Lean job design align with the research objective of discovering the reality of the employee experience of Lean transformation. These findings also relate to the contrasting experiences of those employed in separate organisations who have adopted Lean.

The findings in the area of Lean job design and the employee experience of the Lean were linked to the area of organisational communication and the reasons organisations chose to adopt Lean. As already mentioned both sets of participants voiced concerns regarding work intensification due to human resource capacity being removed through process improvement and waste reduction. However, while both organisations used variances on the theme of schedule boards the experiences of employees in organisation 'A' suggest that the capacity created by shortening cycle time is used to feed more of the same work through the system, this would appear to concur with the opinion that Lean is inherently mean (Parker 2003; Stewart et al. 2010; Carter et al 2012; 2013). However In organisation 'B' the capacity freed up by use of the process improvement projects is used to engage employees in new projects or varied work, this would support those who see Lean as an enabler (Johnstone et al. 2011; Hasle et al.2012).

The organisational management of Lean job design in organisation 'A' suggests that it undermines the respect for people principle and creates an affective discontent among employees; this is manifest in the areas of job security, participation in decision making and communication (Ohno, 1988; Conti et al., 2006; Holbeche, 2012). In organisation 'B' the employees positive sentiment regarding job security, career prospects, and connectivity with organisational goals is an indication of the organisations understanding of the respect for people principle. The findings show that the key areas that influenced how employees judged their experience of the process were workload management, job security, career progression, recognition and reward, and communication.

In agreement with Angelis et al. (2011) it is apparent from the findings that using Lean as a cost cutting tool where capacity created is used to reduce headcount and intensify work lowers employee engagement and creates a negative view of Lean. On the other hand where the capacity created is used to remove mundane tasks and replace them with challenging work or value added projects this increases engagement and provides a rational framework for employees to engage with the

process. Thus Lean can be either self-defeating or self-perpetuating depending on the organisational management of Lean job design.

The findings would tend to be in disagreement with the absolutist view of Lean as inherently inimical to a positive employee experience (Parker 2003; Stewart et al. 2010; Carter et al 2012; 2013).

Although the experiences of employees in organisation 'B' would tend to agree with the findings of Johnstone et al. (2011) which were conducted with a similar participant sample in the pharmaceutical industry. However the research limitations must constrain any definitive link between the two.

Apropos of the study results sitting in the middle of two extremes the findings would suggest that the employee and the organisational experience of Lean is conditional on the alignment between what the organisation expects, promises and delivers and the reciprocal obligations and discretionary efforts of the employees. This suggests that Lean is affectively neutral with experiences and outcomes wholly dependent on management style, competency, and their appreciation of Lean philosophy. The closer that the organisation comes to integrating the respect for people principle into their culture the better the outcome for the employees and the organisation (Conti et al. 2006; Seddon and Caulkin 2007; Angelis et al. 2011; Bhasin 2011).

5.2.3 Finding 3 Motivating Factors.

The final area addressed in the findings chapter was the effects of individual motivating factors on participant engagement with, and experience of the Lean transformation. These findings bring the personal attributes of the individual and their satisfaction with terms and conditions of employment into consideration of the employee experience.

The participants were asked questions related to their need for growth and development, their level of knowledge and skill to meet the requirements of the job, and their satisfaction with the terms and condition of employment. It emerged that while one participant in organisation 'A' had a low need for growth the other five participants had an equal need for growth. For those in Organisation 'B' the need for growth was translated into positive engagement with the Lean process. In organisation 'A' the story was more complex. One individual with high need for growth was engaged with becoming a Lean specialist. The other individual in organisation 'A' with high growth was not engaged and was leaving the organisation to seek advancement. This is a reaction to a state of threat appraisal, identified by Fugate et al. (2012), where the employee will act in their perceived best interest. This is also related to the psychological contract where perceived unreasonableness by the employer will result in increased employee turnover (Emiliani 2008a; Armstrong 2012). Indeed one of the participants identified the danger of losing human capital as a reason why organisation 'B' is keen to encourage feedback loops that avoid such scenarios.

Although high growth need strength would seem to be a reason that some employees embrace Lean transformation if the level of context satisfaction is not adequate the employees with high GNS and high knowledge and skill may use their mobility to leave, thus stripping the organisation of a source of operational expertise, organisational memory, and tacit knowledge (Emiliani 2008a; Tracey and Finchbaugh 2011).

5.2.4 Chapter Conclusion

As previously mentioned this study was constructed to ascertain the experience of a particular group of workers, namely laboratory operatives. It is important to note that the personal attributes of the individuals, particularly their level of education as reflected in their appreciation of their levels of knowledge and skill may set them apart from studies that have sampled more disparate groups where levels of education and skill may have been more diverse.

However, when taken in isolation the experiences of both sets of participants would seem to strike a chord with previous studies. Those from organisation 'B' had a mixed experience of the Lean transformation, although the areas of headcount reduction and work intensification were concerns there was an acceptance that change was necessary the survival of the site and Lean was the enabler to do this. This would be in accordance with the view of those who see Lean as neutral. The participants from organisation 'B' shared some of the concerns in the area of headcount and work intensity. However these were not their primary focus and they were more in accordance with the view that Lean was a welcome and enabling philosophy (Johnson et al. 2011)

The findings appear to be in agreement with authors who posit that job design and associated considerations are crucial influences on the employees' experience of Lean. However it is also conditional on the terms and conditions of employment, management competency, skill and knowledge of the employees and the organisations appreciation of Lean philosophy (Seppälä and Klemola, 2004; Dahlggaard and Dahlggaard park, 2006; Angelis et al., 2011; Hasle et al., 2012)

The findings also indicate that the experience of the employees of organisation 'A' and organisation 'B' lies along the spectrum of experience as described by authors who think Lean neutral with responsibility for success related to management style (Conti et al.2006; Seddon and Caulkin 2007; Angelis et al. 2011; Bhasin 2011). From the findings it can be reasonably concluded that there are several factors that influence how employees experience Lean implementation. The key areas that have emerged as influential are the organisational motivations for choosing to adopt Lean as their operational enabler, the level of management competency to formulate and transmit the message of change (CIPD 2012), and the inherent character of the individual. The influence of context satisfaction emerged from the research as a primary motivation in the mechanism of affective engagement; it would be an area for further research to parse the intrinsic and extrinsic factors that affect this area of employee behaviour.

6 CHAPTER 6 CONCLUSIONS

6.1 Chapter Introduction

This final chapter will reaffirm the research objectives that define the purpose of this qualitative inquiry. The issues germane to the research question and its research objectives are discussed and an objective conclusion is offered in the summary of key findings.

6.2 Research Objectives

Whether Lean is inherently positive, negative, or neutral in its effects on job quality and employee outcomes is the subject of much debate in the academic literature. It was the purpose of this study to explore this area in the context of Irish based pharmaceutical manufacturers.

The primary research objectives that emerged from the question had two dimensions. Firstly to discover what outcomes the organisation expected employees to experience, and what outcomes the employees expected to experience. Secondly, the research sought to uncover what job quality related outcomes the employees actually experienced during the Lean transformation.

The secondary research objectives were to compare the experiences of participants in two separate organisations and to discover any critical factors that affect employee engagement with the Lean transformation.

6.3 Summary of Research Findings

The research findings are summarised in the order in which they have been presented in previous chapters.

6.3.1 Expectations of the organisations and the employees

It was apparent from the findings that the words of the organisation must be honest and closely matched with deeds as employees can be expected to make value judgements based on what they actually experience and this will have an effect on how they respond to Lean implementation (Bhasin 2012; Fugate et al 2012). The study also shows that an organisation that regards the process of tactical and strategic communication as a key activity can connect and engage employees on a daily basis. However, when the communication is fragmented and not part of a strategic narrative it may lead to employees disengaging from the process (Tracey and Finchbaugh 2011; Hines et al 2011). It is apparent that Lean implementation requires a supportive communication strategy that is constantly renewed through feedback from those workers tasked with the sharp end of the transformation (Bicheno and Holweg 2009; Hasle 2012).

6.3.2 Employees experience of Lean transformation

The investigation of both organisations concludes that Lean is neutral in its effects on job quality and it is the management style, competency, and their appreciation of Lean philosophy that influences the employee experience. In this study both organisations used Lean tools to effect change to job design, however the difference in outcomes was down to the original reason to adopt Lean. Organisation 'A' was concerned principally with cost reduction and survival and their approach to job design reflected this. In contrast organisation 'B' sees Lean as an enabler to develop capacity building and growth, something also seen in their approach to job design. The closer that the organisation comes to integrating the respect for people principle into their culture the better the outcome for the employees and the organisation (Conti et al.2006; Seddon and Caulkin 2007; Angelis et al. 2011; Bhasin 2011).

6.3.3 Employee engagement

Employee satisfaction with terms and conditions and personal and professional growth opportunities has a major effect on their experience of Lean transformation and can be overlooked. This has consequences for an organisation seeking to maximise the contribution of their human resources. It was a key finding that employees dissatisfied with the changes to their terms and conditions brought on by Lean transformation would leave the organisation. However, there was also an opinion that changes such as flexi-time should be introduced to compensate for workload changes introduced by Lean. Other areas that were linked to engagement were job security and recognition and reward. All of these issues can be seen as part of the respect for people principle. (Conti et al. 2006; Emiliani 2008a; Armstrong 2012).

6.4 Recommendations

The question of work overload is an issue that troubles employees. It is apparent that any ameliorative strategies that can be employed to remove it or lessen its effects are vital. The use of scheduling boards by both organisations were a valuable way of managing overwork by load levelling, however the removal of human resource buffers from a system where the product of the transformation is increased throughput and makes overtime inevitable, especially when employee absence is not factored in to the process. Organisations that operate flexi-time systems can lessen the effects of overwork by providing a mechanism for employees to take time in lieu when the organisation does not require them on site.

The area of communication is vital to effective Lean transformation and it is recommended that organisations should consider making it a fully integrated element of the strategic plan for Lean implementation. This is apparently the approach of organisation 'B' and has resulted in employees being aligned and committed to organisational goals.

6.5 Areas for Further Research

The effect of the personal characteristics of employees on their experience of Lean transformation was an interesting factor that emerged from this study. The fact that employee dissatisfaction with the process could lead to a loss of valuable human capital could be seen as a form of waste and may be an area that could benefit from further research.

The area of organisational job design in the Lean context, and how, why and even if Lean jobs are designed or just emerge was difficult to discover in the review of literature. In order to conduct this study it was necessary to create frameworks from existing literature to design the research. These can be seen in Table 2.5, and Table 2.7. This area could benefit from further research and codifying of the key elements of Lean job characteristics and Lean job design.

6.6 Limitations of the study

As previously mentioned the limitations of the research undertaken for this study are the small sample size and the restriction of the study to laboratory operatives in pharmaceutical manufacturers compromises generalizability. As a result it could be useful to revisit the area with a larger coterie of organisations and an increased sample size.

6.7 Conclusion Summary

The opinions on what Lean means for employees are diverse ranging from those who see Lean as enabling and empowering employees to those who condemn it as intensified mass production with social interaction removed. This study sees Lean as a neutral philosophy for system improvement. It is the interpretation and deployment of Lean and the capability and competence of those deploying it that will decide on how employees experience it.

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APPENDICES

Appendix 1: Participant Consent Form

Respondent Consent Form: #

13/06/2014

Informed Consent Form – For participants in the research project: ‘The effects of an organisation-wide lean transformation on the employee experience of job quality and associated outcomes: A study of laboratory operatives in Irish-based pharmaceutical and medical device manufacturers’.

Dear

Thank you for your willingness to participate in the above research project which is being undertaken as part of my dissertation for the Master of Business in Lean Practice at Waterford Institute of Technology.

Before the interview begins I would like to inform you that as a participant in this project:

- Your participation in this interview is entirely voluntary.
- You are free to refuse to answer any question at any time.
- You are free to withdraw from the interview at any stage.
- You will not be personally identified in my research or findings, and will be anonymous in final publication.
- Your company will not be identified in my research or findings, and will be anonymous in final publication.

The contents of the interview will be kept **strictly confidential and anonymous**. Extracts from this interview may be included as in the text of the final research report, but under no circumstances will your name or any identifying characteristics be included. Any references to your name or company name will be deleted from the interview transcript. Any tape recording of this interview will be destroyed following final transcription.

I would be grateful if you would sign this form to indicate that I have read you its contents.

(Signed) _____

(Printed) _____

(Date) _____

John O'Mahoney

Masters Student

Waterford Institute of Technology

Student I.D. Number 20059519

Email: omahoney66@gmail.com

Tel: 087 2557507

Appendix I1 Data Sources

Appendix 1.1 Source data

Source data for findings relating to employee perception of why the organisation chose to be Lean

Table containing the source data which provided the data for Figure 4.1: Employee Perceptions of Why the Organisation Chose to be Lean

Employee Perception Of Why the Organisation Chose To Be Lean		
Nodes Coded At	Participants Organisation A Source	Participants Organisation B Source
Capacity Building	7	33
Cost Reduction	9	2
Headcount Reduction	16	5

Appendix 1.2 Non-consolidated data for Figure 4.2

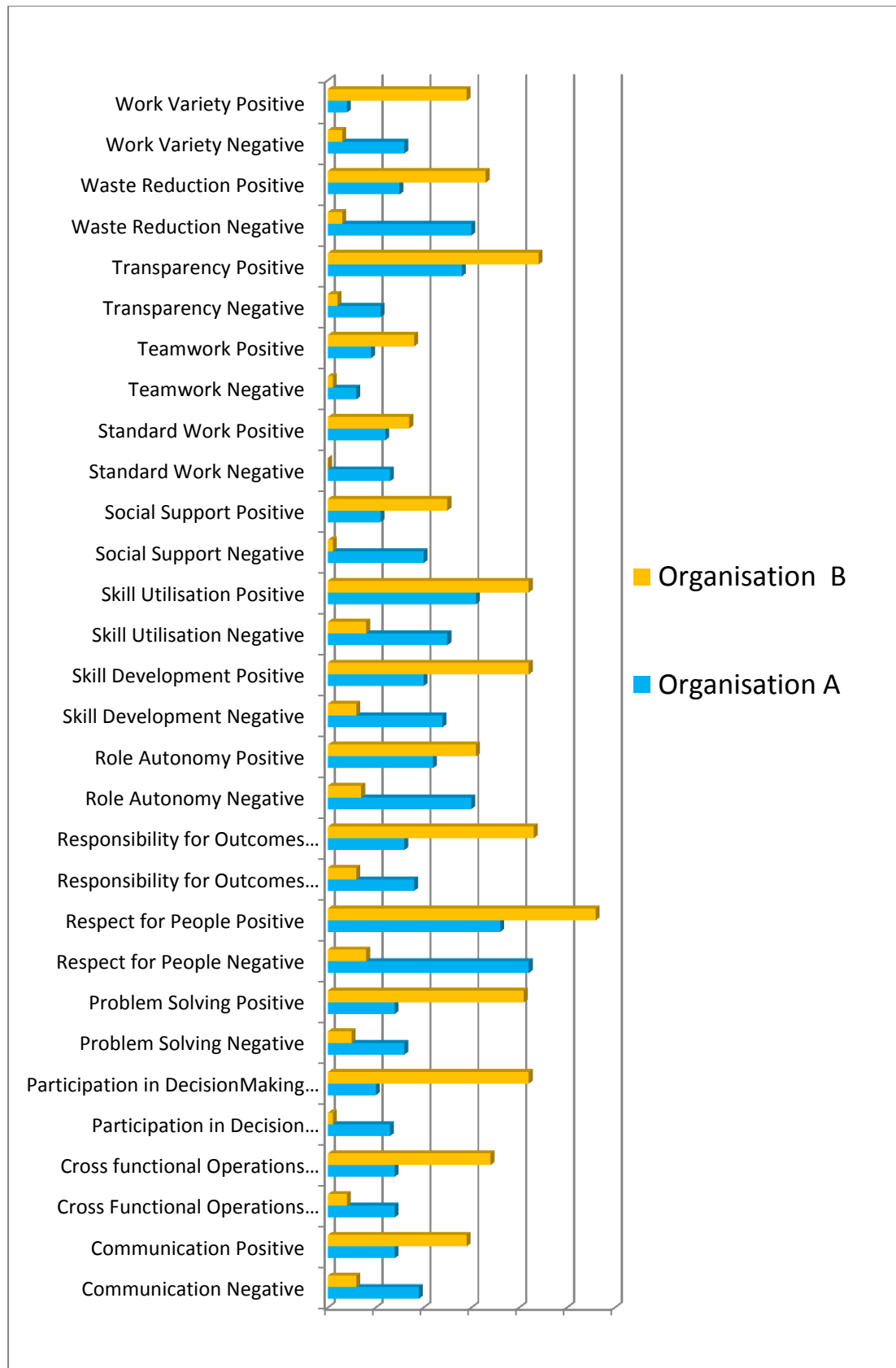
Nodes, coding and non-consolidated findings relating to employees perception of organisational management Lean job design

Table containing the source data for the consolidated chart of employee sentiment regarding organisational management of Lean job design

Coding For Positive Versus Negative Views of Organisational Management Of Lean Job Design		
Lean Job Characteristics Grandchild Nodes	Organisation A	Organisation B
Communication Negative	19	6
Communication Positive	14	29
Cross Functional Operations Negative	14	4
Cross functional Operations Positive	14	34
Participation in Decision Making Negative	13	1
Participation in Decision Making Positive	10	42
Problem Solving Negative	16	5
Problem Solving Positive	14	41
Respect for People Negative	42	8
Respect for People Positive	36	56
Responsibility for Outcomes Negative	18	6
Responsibility for Outcomes Positive	16	43
Role Autonomy Negative	30	7
Role Autonomy Positive	22	31
Skill Development Negative	24	6
Skill Development Positive	20	42
Skill Utilisation Negative	25	8
Skill Utilisation Positive	31	42
Social Support Negative	20	1
Social Support Positive	11	25
Standard Work Negative	13	0
Standard Work Positive	12	17
Teamwork Negative	6	1
Teamwork Positive	9	18
Transparency Negative	11	2
Transparency Positive	28	44
Waste Reduction Negative	30	3
Waste Reduction Positive	15	33
Work Variety Negative	16	3
Work Variety Positive	4	29

Chart displaying the non-consolidated findings relating to Figure 4.2:

Consolidated Table of Employee Sentiment



Appendix 1.3 Coding relating to Motivating Factors and Job Satisfaction

Table containing the source data which provided the information used to produce Figure 3: Individuals Growth Need strength (GNS).

Growth need Strength by Organisation		
Growth need Strength Comparative Level	Participants Organisation A Source	Participants Organisation B Source
GNS High	7	12
GNS Low	1	0
GNS Neutral	0	0

Table containing the source data which provided the information used to produce Figure 4: Level of Knowledge and Skill.

Knowledge and Skill by Organisation	Organisation A	Organisation B
Knowledge & Skill High	15	12
Knowledge & Skill Low	0	0
Knowledge & Skill Neutral	2	0

Table containing the source data which provided the information used to produce Figure 5: Context Satisfaction.

Context Satisfaction By Organisation	Organisation A	Organisation B
Context Satisfaction High	2	16
Context Satisfaction Low	5	0
Context Satisfaction Neutral	3	0

Appendix 1.4 Project Summary Report

15/08/2014 11:33					
Project Summary					
MBS Disssertation 9 August					
15/08/2014 11:33					
Hierarchical Name	Item Type	Created By Username	Created On	Modified By	Modified On
C:\Users\John O'M\Desktop\Aug Nvivo Analysis\Nvivo Reports					
Created By:	The Analysis of data for MBS Lean				
Created On:					
Last Modified By:					
Nodes					
Nodes\Employee Perceptions of Organisational Reasons for Adopting Lean	Node	John O'M	09/08/2014 11:54	John O'M	13/08/2014 12:40
Nodes\Employee Perceptions of Organisational Reasons for Adopting Lean \Capacity Building	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\Employee Perceptions of Organisational Reasons for Adopting Lean \Cost Reduction	Node	John O'M	13/08/2014 12:41	John O'M	15/08/2014 11:11
Nodes\Employee Perceptions of Organisational Reasons for Adopting Lean \Headcount	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\Experiences	Node	John O'M	09/08/2014 11:54	John O'M	08/08/2014 18:11
Nodes\Job Characteristic Model (JCM)	Node	John O'M	09/08/2014 11:54	John O'M	12/08/2014 17:22
Nodes\Job Characteristic Model (JCM)\1. Core Job Characteristics	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 12:52
Nodes\Job Characteristic Model (JCM)\1. Core Job	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 12:47
Nodes\Job Characteristic Model (JCM)\1. Core Job	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 12:50
Nodes\Job Characteristic Model (JCM)\1. Core Job Characteristics\Skill Variety	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 12:43
Nodes\Job Characteristic Model (JCM)\1. Core Job Characteristics\Task Identity	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 12:43
Nodes\Job Characteristic Model (JCM)\1. Core Job Characteristics\Task Significance	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 12:43
Nodes\Job Characteristic Model (JCM)\2. JCM Moderators	Node	John O'M	09/08/2014 11:54	John O'M	12/08/2014 17:58

Nodes\Job Characteristic Model (JCM)\2. JCM Moderators\Context Satisfaction	Node	John O'M	09/08/2014 11:54	John O'M	13/08/2014 08:56
Nodes\Job Characteristic Model (JCM)\2. JCM Moderators\Context Satisfaction\Context Satisfaction	Node	John O'M	12/08/2014 10:13	John O'M	15/08/2014 11:09
Reports\Project Summary Report			Page 1 of 8		
15/08/2014 11:33					
Hierarchical Name	Item Type	Created By Username	Created On	Modified By	Modified On
Nodes\Job Characteristic Model (JCM)\2. JCM Moderators\Context Satisfaction\Context Satisfaction	Node	John O'M	12/08/2014 10:15	John O'M	15/08/2014 11:11
Nodes\Job Characteristic Model (JCM)\2. JCM Moderators\Context Satisfaction\Context Satisfaction Neutral	Node	John O'M	12/08/2014 10:15	John O'M	15/08/2014 11:09
Nodes\Job Characteristic Model (JCM)\2. JCM Moderators\Growth Need Strength	Node	John O'M	09/08/2014 11:54	John O'M	13/08/2014 08:56
Nodes\Job Characteristic Model (JCM)\2. JCM Moderators\Growth Need Strength\GNS High	Node	John O'M	12/08/2014 10:16	John O'M	15/08/2014 11:09
Nodes\Job Characteristic Model (JCM)\2. JCM Moderators\Growth Need Strength\GNS Low	Node	John O'M	12/08/2014 10:16	John O'M	15/08/2014 11:09
Nodes\Job Characteristic Model (JCM)\2. JCM Moderators\Growth Need Strength\GNS Neutral	Node	John O'M	12/08/2014 10:16	John O'M	12/08/2014 18:18
Nodes\Job Characteristic Model (JCM)\2. JCM Moderators\Knowledge and Skill	Node	John O'M	09/08/2014 11:54	John O'M	13/08/2014 08:56
Nodes\Job Characteristic Model (JCM)\2. JCM Moderators\Knowledge and	Node	John O'M	12/08/2014 10:17	John O'M	15/08/2014 11:11
Nodes\Job Characteristic Model (JCM)\2. JCM Moderators\Knowledge and	Node	John O'M	12/08/2014 10:17	John O'M	12/08/2014 18:18
Nodes\Job Characteristic Model (JCM)\2. JCM Moderators\Knowledge and	Node	John O'M	12/08/2014 10:17	John O'M	15/08/2014 11:09
Nodes\Job Characteristic Model (JCM)\3. Critical Psychological	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 12:52
Nodes\Job Characteristic Model (JCM)\3. Critical Psychological States\Knowledge of Outcomes	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 11:50
Nodes\Job Characteristic Model (JCM)\3. Critical Psychological States\Meaningfulness of Work	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 11:46
Nodes\Job Characteristic Model (JCM)\3. Critical Psychological States\Responsibility	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 11:48
Nodes\Job Characteristic Model (JCM)\4. Outcomes	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 12:52
Nodes\Job Characteristic Model (JCM)\4. Outcomes\Growth	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 13:00
Nodes\Job Characteristic Model (JCM)\4. Outcomes\Job	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 13:00

Nodes\\Job Characteristic Model (JCM)\\4. Outcomes\\Work	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 13:01
Nodes\\Job Characteristic Model (JCM)\\4. Outcomes\\Work	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 12:59
Nodes\\Lean Job Characteristics	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 13:04
Nodes\\Lean Job Characteristics\\Communication	Node	John O'M	09/08/2014 13:08	John O'M	09/08/2014 13:40
Nodes\\Lean Job Characteristics\\Communication\\Negative Communication	Node	John O'M	09/08/2014 13:09	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\\Communication\\Positive-Communication	Node	John O'M	09/08/2014 13:08	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Cross Functional	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:29
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15/08/2014 11:33					
Hierarchical Name	Item Type	Created By Username	Created On	Modified By	Modified On
Nodes\\Lean Job Characteristics\\Cross Functional Operations\\Negative -Cross	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\\Cross Functional Operations\\Negative -Cross	Node	John O'M	09/08/2014 11:54	John O'M	14/08/2014 10:32
Nodes\\Lean Job Characteristics\\Cross Functional Operations\\Negative -Cross Functional Operations\\Work	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\\Cross Functional Operations\\Positive- Cross	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Cross Functional Operations\\Positive- Cross functional Operations\\Career	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Cross Functional Operations\\Positive- Cross functional Operations\\Personal	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Cross Functional Operations\\Positive- Cross functional Operations\\Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Participation in decision making	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:29
Nodes\\Lean Job Characteristics\\Participation in decision making\\Negative- Participation in Decision Making	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Participation in decision making\\Negative- Participation in Decision Making\\Increased responsibility-	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 15:36
Nodes\\Lean Job Characteristics\\Participation in decision making\\Negative- Participation in Decision	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11

Nodes\\Lean Job Characteristics\Participation in decision making\Positive-Participation in Decision making	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Participation in decision making\Positive-Participation in Decision	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Participation in decision making\Positive-Participation in Decision making\Increased Responsibility-	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Problem Solving	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:29
Nodes\\Lean Job Characteristics\Problem Solving\Negative-Problem Solving	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Problem Solving\Negative-Problem Solving\Extra Workload	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
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Hierarchical Name	Item Type	Created By Username	Created On	Modified By	Modified On
Nodes\\Lean Job Characteristics\Problem Solving\Negative-Problem Solving\Increased Accountability	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 15:42
Nodes\\Lean Job Characteristics\Problem Solving\Positive-Problem Solving	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Problem Solving\Positive-Problem Solving\Challenging and	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Problem Solving\Positive-Problem Solving\Engagement	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Respect For People	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:30
Nodes\\Lean Job Characteristics\Respect For People\Negative-Respect for	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Respect For People\Negative-Respect for People\Headcount Reduction	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Respect For People\Negative-Respect for People\Insufficient Recognition and Reward	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Respect For People\Negative-Respect for People\Overwork	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11

Nodes\\Lean Job Characteristics\Respect For People\Negative-Respect for People\Work Intensification	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Respect For People\Positive -Respect for	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Respect For People\Positive -Respect for People\Employee Development	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Respect For People\Positive -Respect for People\Open Honest	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Respect For People\Positive -Respect for People\Recognition and Reward	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Responsibility for Outcomes	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:30
Nodes\\Lean Job Characteristics\Responsibility for Outcomes\Negative-Responsibility for Outcomes	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Responsibility for Outcomes\Negative-Responsibility for Outcomes\Increased	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
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Hierarchical Name	Item Type	Created By Username	Created On	Modified By	Modified On
Nodes\\Lean Job Characteristics\Responsibility for Outcomes\Negative-Responsibility for Outcomes\Risk	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Responsibility for Outcomes\Positive-Responsibility for Outcomes	Node	John O'M	09/08/2014 11:54	John O'M	14/08/2014 10:23
Nodes\\Lean Job Characteristics\Responsibility for Outcomes\Positive-Responsibility for Outcomes\Engagement	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Responsibility for Outcomes\Positive-Responsibility for Outcomes\Role Certainty	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Role autonomy	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:30
Nodes\\Lean Job Characteristics\Role	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Role autonomy\Negative-Role	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09

Nodes\\Lean Job Characteristics\Role autonomy\Negative-Role	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Role	Node	John O'M	09/08/2014 11:54	John O'M	12/08/2014 11:09
Nodes\\Lean Job Characteristics\Role autonomy\Positive-Role	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Role autonomy\Positive-Role	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Skill Development	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:31
Nodes\\Lean Job Characteristics\Skill Development\Negative-Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Skill Development\Negative-Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Skill Development\Negative-Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Skill Development\Negative-Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Skill Development\Positive-Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Skill Development\Positive-Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Skill Development\Positive-Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Skill Utilisation	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:32
Nodes\\Lean Job Characteristics\Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Skill Utilisation\Negative-Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
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Hierarchical Name	Item Type	Created By Username	Created On	Modified By	Modified On
Nodes\\Lean Job Characteristics\Skill Utilisation\Negative-Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Skill Utilisation\Positive-Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Skill Utilisation\Positive-Skill	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Social Support	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:32
Nodes\\Lean Job Characteristics\Social	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11

Nodes\\Lean Job Characteristics\\Social Support\\Negative-Social	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Social Support\\Negative-Social	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Social	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Social Support\\Positive-Social	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Social Support\\Positive-Social	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\\Standard Work	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:32
Nodes\\Lean Job Characteristics\\Standard Work\\Negative-Standard Work	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 16:14
Nodes\\Lean Job Characteristics\\Standard Work\\Negative-Standard Work\\Reduced Autonomy	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\\Standard Work\\Negative-Standard Work\\Reduced Engagement	Node	John O'M	09/08/2014 11:54	John O'M	14/08/2014 10:32
Nodes\\Lean Job Characteristics\\Standard Work\\Positive-Standard Work	Node	John O'M	09/08/2014 11:54	John O'M	14/08/2014 16:32
Nodes\\Lean Job Characteristics\\Standard Work\\Positive-Standard	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Standard Work\\Positive-Standard	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Teamwork	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:32
Nodes\\Lean Job Characteristics\\Teamwork\\Negative-Teamwork	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Teamwork\\Negative-Teamwork\\Excessive	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 14:28
Nodes\\Lean Job Characteristics\\Teamwork\\Negative-Teamwork\\Management by	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
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Hierarchical Name	Item Type	Created By Username	Created On	Modified By	Modified On
Nodes\\Lean Job Characteristics\\Teamwork\\Positive-Teamwork	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\\Teamwork\\Positive-Teamwork\\Social Learning	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09

Nodes\\Lean Job Characteristics\Teamwork\Positive-Teamwork\Social Support	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Transparency	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:31
Nodes\\Lean Job Characteristics\Transparency\Negative-Transparency	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Transparency\Negative-Transparency\Accountability-Seen as Bad	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Transparency\Negative-Transparency\Information	Node	John O'M	12/08/2014 16:09	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Transparency\Negative-Transparency\Management by	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Transparency\Positive-Transparency	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Transparency\Positive-Transparency\Accountability-Seen as Good	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Transparency\Positive-Transparency\Appreciation of Value Stream	Node	John O'M	12/08/2014 16:09	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Transparency\Positive-Transparency\Connection to the Customer	Node	John O'M	12/08/2014 16:09	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Transparency\Positive-Transparency\Fairness	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Transparency\Positive-Transparency\Improved Communication	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Waste Reduction	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:31
Nodes\\Lean Job Characteristics\Waste	Node	John O'M	09/08/2014 11:54	John O'M	05/08/2014 16:13
Nodes\\Lean Job Characteristics\Waste Reduction\Negative-Waste	Node	John O'M	09/08/2014 11:54	John O'M	14/08/2014 10:32
Nodes\\Lean Job Characteristics\Waste Reduction\Negative-Waste	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Waste Reduction\Negative-Waste	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Waste	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
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Nodes\\Lean Job Characteristics\Waste Reduction\Positive-Waste Reduction\Build Capacity For	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Waste Reduction\Positive-Waste	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Waste Reduction\Positive-Waste Reduction\Involvement With Job	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Work Variety	Node	John O'M	09/08/2014 11:54	John O'M	11/08/2014 16:31
Nodes\\Lean Job Characteristics\Work	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Work Variety\Negative-Work	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Work Variety\Negative-Work	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:11
Nodes\\Lean Job Characteristics\Work	Node	John O'M	09/08/2014 11:54	John O'M	12/08/2014 11:09
Nodes\\Lean Job Characteristics\Work Variety\Positive-Work	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Lean Job Characteristics\Work Variety\Positive-Work	Node	John O'M	09/08/2014 11:54	John O'M	15/08/2014 11:09
Nodes\\Participants	Node	John O'M	09/08/2014 11:54	John O'M	13/08/2014 09:11
Nodes\\Participants\Participant 1 Interview	Node	John O'M	10/08/2014 14:59	John O'M	15/08/2014 11:09
Nodes\\Participants\Participant 2 Interview	Node	John O'M	10/08/2014 14:59	John O'M	15/08/2014 11:11
Nodes\\Participants\Participant 3 Interview	Node	John O'M	10/08/2014 14:59	John O'M	15/08/2014 11:09
Nodes\\Participants\Participant 4 Interview	Node	John O'M	10/08/2014 14:59	John O'M	14/08/2014 16:32
Nodes\\Participants\Participant 5 Interview	Node	John O'M	10/08/2014 14:59	John O'M	13/08/2014 09:22
Nodes\\Participants\Participant 6 Interview	Node	John O'M	10/08/2014 14:59	John O'M	14/08/2014 10:32
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