LEARNING ORGANIZATION PRINCIPLES AND PROCESSES: UK CONSTRUCTION ORGANIZATION EXPERIENCES

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Declaration

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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Abstract

The study reported herein addresses the research question, "To what extent do excellent performing UK construction contracting organizations demonstrate and employ recognized Learning Organization processes?" It utilized a case-study based approach as that approach was seen as being most useful for exploring the processes that may or may not have been clearly defined by each participating organization. The study sought to move beyond the theories of knowledge created by the accepted seminal works on The Learning Organization model and the largely positivist works on construction contractor performance, which have focussed on ‘output’ measures only.

The literature reviewed indicated minimal understanding of excellent contractor performance from the perspective of the customer within the construction industry and even less understanding of the practical application of Learning Organization processes within the industry. It suggested the need for research to address the issue by examining how construction customers viewed excellent contractor performance and what processes excellent performing contractors actually employed.

The assumption behind this research is that the organization adapts and responds to its environment and takes action to survive and flourish dependent upon its understating of that environment. This is the same behaviour as a living organism in nature displays, and thus requires the researcher to view the organization as a sentient being. Such a view underscores the epistemological perspective, that is the assumption of what knowledge is and how it may be discovered, adopted in this thesis. The research herein reported therefore follows a post-positivist standpoint. The methodological position for the research sits within a functionalist paradigm, a paradigm that enables consideration of the participating organizations within the construction industry to be viewed as a ‘whole’ and as having interrelated parts. This position was considered to be the most useful for the research.

The particular approach chosen was that of multiple case studies carried out on the same subject. Carrying out multiple case studies across different organizations provided case-based themes, which was seen to give the research a greater credibility. By definition, the method was therefore one of a collective case study
(Creswell, 2007), where several cases were brought to bear on a single issue. It was intended to draw practical examples of Learning Organizations together so that the commonalities and differences between and among them could be integrated in a reformulated Learning Organization model for the construction industry.

During the data collection phase, two elements of the research were abandoned as unnecessary and impractical respectively. The unnecessary element was the questionnaire element of the contractor case studies, which was abandoned due to the breadth and depth of data gathered through the other elements of the research (interviews, focus groups and field observation). The impractical element was the intended comparative study on poor performing contractors. This was abandoned as customers almost without fail noted that poor performing contractors were generally not retained on their programmes and therefore their supply chains tended only to range in performance from adequate to excellent. Secondly, it was realized following discussions with customers that poor performers were likely to be aware of their poor performing status and therefore be unlikely to want to participate in the research.

The customer organizations identified a number of clear areas where they identified excellent contractor performance. The clear position was that the standard output performance indicators of project completion to time, cost, quality, and health and safety were no longer indicators of excellent performance in the industry. These indicators were now the minimum performance required to satisfy the customer and there was seen to be a further suite of more behavioural measures which were the indicators of excellent performance. These findings were drawn together in a single model for procurement and performance management.

The contracting organizations nominated as excellent performers fell largely into the ‘medium sized’ bracket of the construction industry. Indeed, some of the participating customers noted that the larger contractors were actually poorer performers at behavioural aspects of service delivery. The nominated contractors’ processes were examined against the Learning Organization framework provided in Senge et al (1990, 1994) to establish the extent to which recognized Learning Organization processes were being employed. It was noted in the conclusions that whilst all of the organizations employed some Learning Organization processes, none could be said to be a model Learning Organization possessing all of the processes which Senge et al (1990, 1994) suggested. The fact that each organization possessed some Learning Organization processes was accepted against the critique

Implications for industry practice were identified based upon the backdrop of procurement and performance management. It was argued that, based on what is noted as really important to construction customer organizations, the procurement and performance management functions should be better aligned to identify Learning Organization processes and their manifestation as excellent contractor performance from the perspective of the customer. For contractor organizations, there was identified a need to attend to developing Learning Organization processes. There also appeared to be a need for the customer to support the journey of their contractors towards becoming a Learning Organization.

Senge et al’s (1990, 1994) model was then adapted for the construction industry to reflect this need for customer involvement if the contractor was to adopt Learning Organization processes. This adaptation was considered necessary due to the construction industry model of the customer being more involved in the design and construction phases of their product, coupled with the fact that a single construction customer can represent a large volume of their contractors’ turnover (up to 20% is not uncommon). Furthermore, the low contractor profit margins driven by a lowest price tendering culture (often 2-3%) leave little money for internal investment. The support of an informed customer which does not use a lowest price tendering process was therefore deemed necessary.

A number of recommendations for further research may be seen to emerge from this study. Questions were raised as to the reason why larger organizations do not appear as able to provide behavioural excellent performance as medium sized contractors which was considered to be an area for further exploration. In addition, the concept of ‘family’ atmosphere (raised several times by participants during the contractor case studies) and its impact upon the ability for the organization to learn and provide excellent performance was seen to be worthy of further study. Finally, there was deemed to be the potential to examine the applicability of the extended Learning Organization model developed herein to other industries and/or organizational cultures.
The ‘Learning Organization’ Contractor in the UK Construction Industry

Abbreviations Used Herein

CDM – Construction Design & Management
CEO – Chief Executive Officer
CPD – Continuing Professional Development
EFQM – European Foundation for Quality Management
EI – Emotional Intelligence
FM – Facilities Management
HR – Human Resources
HRD – Human Resource Development
HRM – Human Resources Management
JV – Joint Venture
KPI – Key Performance Indicator
LO – Learning Organization
MD – Managing Director
PDR – Personal Development Review
PM – Project Manager
PPP – Public Private Partnership
ROCE – Return on Capital Expended
SPV – Special Purpose Vehicle
TUPE – Transfer of Undertakings, Permanent Employment
TQM – Total Quality Management
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1 Introduction

The purpose of this chapter is to introduce the thesis and its component parts. The first section sets out the background to the research herein reported, locating that research within the UK construction industry. The research is exploratory in nature as the intention is to see whether the construction organization which demonstrates processes most closely attributed to those sometimes associated with a Learning Organization (LO) provides excellent performance to its customers.

The second section, entitled justification for the research, the research problem, and the research questions outlines why the research is considered to be of importance and mentions the five disciplines of Senge et al’s LO that provide an analytical framework for the thesis. Some contextual understanding of the research problem follows. The research question and a series of sub-questions to be addressed in the research herein reported are then stated.

The third section provides a brief outline of the chosen methodology which is contextualised within nomothetic and ideographic perspectives. This section also contains a brief introduction to the UK construction industry and outlines what is understood by the terms ‘contractor’ and ‘customer’ within this thesis.

The fourth and final section briefly outlines the structure of the thesis. It also states why this thesis makes a significant contribution to industry practice and to knowledge.

1.1 Background to and justification for the research

The research question itself spawned from a conversation which the author had with one of his key customers. This customer wished to understand whether and how his first tier contractors learned; and whether and how this improved the service they provided to that customer. The customer had stated that he did not believe in the concept of the LO. He was of the opinion that only individuals learned and, through such learning, raised their performance to the customer. He was also of the view that first tier contracting organizations did not capture that learning well.

The author had an opposite view, namely that contracting organizations must learn in order to survive and that they learn in the same way as an organism. Instead of an organism made up of living cells, there is an organization made up of living
individuals. There is further discussion of the organism as a model for the organization in the literature review chapter.

The research, therefore, almost became an opportunity to understand and settle this difference of opinion. The question of whether the concept of the LO was a model that first tier contractors could and did employ was to be the first part of the research. The second part was to answer the question of whether this model could translate into improved contractor performance from the perspective of the customer.

The context of this research is the UK construction industry which has been criticized for, amongst other things, its lack of change and innovation leading to an inability to improve performance and reduce cost/waste (Egan, 2002). Egan (2002) also states that construction teams tend to be transient because they are generally drawn together from many organizations to deliver a single project or programme. This project singularity and ad-hoc nature of teams leads to individual and single loop learning (following Argyris & Schon, 1978) taking place on the job at the expense of the customer.

Single loop learning involves the detection and correction of error. When something goes wrong, another strategy that will work within the governing variables is generally employed. Goals, values, plans and rules are operationalized and not questioned (Argyris & Schon, 1974). Single loop learning rarely appears to be transmitted back through the organization in order to develop and change the body of knowledge and underlying assumptions of the organization so that processes may be improved.

Chinowsky et al (2007) describes the construction industry as one where the focus on production often overshadows any process improvement required of the organization. This production focus spills over into a ‘learn-on-the-job’ culture which allows for production objectives to be maintained almost at the expense of individual and Team Learning (Raiden & Dainty, 2006). Notwithstanding cultural and habitual issues, there should be no reason why a construction organization cannot adopt many elements inherent in a LO approach (Raiden & Dainty, 2006).

The prevalence of single loop learning and a production focus may mean that others from the same organization are likely to travel through the same single loop individual learning process when they come to deliver a very similar project/programme (Cheng et al, 2004). In addition, a failure to challenge the underlying knowledge and assumptions may mean that the organization becomes
slow to change and that finding new customer-orientated solutions is rarer than it should be (Chinowsky et al., 2007). This lack of change may mean that the organization is slow to react to a rapidly changing environment, or misses the opportunity to take the lead in reshaping the environment; two capabilities of the LO as discussed by Senge et al. (1994).

Construction organizations are also historically weak at showing flexibility and acting proactively or even reactively to the changing demands of their environment or their customers. In addition, previous research has demonstrated that most organizations within the industry employ the same strategies and operational procedures (Holt et al., 2000). Such a lack of response to changing demands appears to show little regard for how process improvement should reflect the culture of the organization. Without this alignment, it is unlikely that the concept of an organization as a LO can exist within the UK construction industry.

The confirmation that the situation has not significantly improved in the UK construction industry in recent years came when Sir John Egan gave a speech to industry leaders in June 2008 on the tenth anniversary of the issuing of his first industry report (see Egan, 1998). In this speech he was quoted as giving the industry as a whole “four out of ten” for implementing the required changes and demonstrating the required improvements over those ten years. Clearly this criticism indicates room for improvement and suggests scope for research and learning.

There is further merit for the line of enquiry adopted within this thesis due to the paucity of research into the customer benefits derived from becoming a LO in the UK construction industry (following Love et al., 2004). Raiden & Dainty (2006) also states that there is little research into whether adopting LO processes improves performance to the customer in a UK working environment generally.

Of the little research that has touched upon this area, Chan et al. (2005) notes that recent works have suggested that it is the customers themselves that drive Organizational Learning within their own contractors in order to derive benefits. Cheng et al.’s (2004) position is that a learning culture and climate should be created in construction partnering environments in order to drive continuous improvement. This piece of research is the most in depth of the recent works; unfortunately it only brings together theoretical works rather than examining real life case studies.

Furthermore, much of the recent research in this subject area has been quantitative in nature, such as Jashapara (2003); or has been more of a review of recent
literature with an attempt to reflect the findings in those reviews onto the UK construction industry, as in the works of Love et al (2004) and Maqsood et al (2007). Whilst there is utility in these approaches for furthering the understanding of the subject, it could be contended that quantitative outcomes do not provide the understanding as to whether LO processes translate to an organization which provides better performance to its customers than its peer group within the UK construction industry. Thus, the research herein reported is qualitative in nature.

It has been postulated that becoming a LO is a capability that enables the organization to obtain improvement in organizational financial performance (Garcia-Morales et al, 2007). The financial viewpoint can be summed up in a single quote from Lew Platt, former Chief Executive Officer (CEO) of Hewlett-Packard: “If HP knew what HP knows, we would be three times as profitable” (Yang, 2007: 83). A broader view is offered by Senge et al (1990: 3) when he says that what is required is:

Organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together.

This quote serves as a useful framework for the research herein reported as it sums up the LO’s five disciplines, as proposed by Senge et al, and the results that they create. People expanding their capacity refers to Personal Mastery; new patterns of thinking refers to Mental Models; seeing together refers to Shared Vision; people continually learning refers to Team Learning; and seeing the whole refers to Systems Thinking. Each of these disciplines is further explained in this thesis.

The creation of improved results is the key object from the perspective of the research undertaken for this thesis, as without the ability to create improved results from LO processes, there would be scant business drivers for adopting such processes. Love et al (2004) draws from Nonaka & Takeuchi (1995) in suggesting that the key success factor for construction organizations in the future will be the intellectual capital it can deploy rather than its size or physical assets. Love et al (2004) goes on to make the very salient point that given the industry’s well documented poor performance (Egan, 2002), repeating current strategies are likely to lead to poor performance and a reduction in profits.

Garcia-Morales et al (2007) states that there is currently little understanding of whether LO processes translate into improvement in service performance. In
addition, he critiques the empirical research on the basis that it fails to take into account the time lag between LO process and performance. One of the key issues with the empirical research cited within this thesis is that much of it purports to demonstrate links between single processes and organizational performance. Many of the links, however, may be indirect and possess other interrelationships which also influence organizational performance, as suggested by Garcia-Morales et al (2007). Much of the recent research appears to neglect this premise (Garcia-Morales et al, 2007).

The research herein reported identifies such interactions and provides an understanding as to whether those interactions really do have a direct influence upon organizational performance. If this research is to be of value to the UK construction industry, it needs to demonstrate that not only do contractors with recognized LO processes perform best for their customers, but also that these organizations can be identified at a stage before contracts are established. This insight will allow customers to be able to identify the best performing organizations by looking for the LO processes at the procurement stage of the contract process.

There is also little clear understanding about how contracting organizations interact with their environment (Love et al, 2004). Currently, nearly all customer relationships, whether based around a single project or a large programme of works, are contractually based. Indeed, relationships that purport to be ‘alliances’ often have a contract as their basis. These contracts are likely to have been competitively tendered in some way. It may be argued that these tendering and contractual processes do not give enough understanding, from any party’s perspective, of the way in which interaction may be seen to take place.

A LO should be adept at shaping its environment (Senge et al 1990, 1994). Therefore a construction LO should be more likely to produce excellent performance for their customer. Garcia-Morales et al (2007) suggests that becoming a LO usually has a direct and positive influence on improvements in performance. Organizations that demonstrate greater breadth, depth and speed in their learning deliver higher performance (Garcia-Morales et al, 2007). The main aim of organizational learning is to enhance performance. Organizations that learn quickly gain a greater strategic capability that enables them to maintain a position of competitive advantage. Their learning strategies, attitudes, and behaviours guide them to superior long-term performance. In addition, creating organizational knowledge, by which new knowledge is drawn out of existing knowledge, is a cornerstone of innovation.
Garcia Morales’ (2007) position is highly plausible and aligns well with Senge et al (1990, 1994). However, the research used to support Garcia Morales’ (2007) argument is qualitative and the performance discussed is the CEO’s opinion of how his organization performs compared to his competitors. The performance factors are also all internal rather than customer facing. As such, Garcia-Morales et al’ (2007) position has potential participant bias and thus requires further exploration.

Holt et al (2000) also proposes that construction organizations need to become LOs in order to gain competitive advantage over their peer group. His position is that this advantage can be gained by being able to do three things better than its competitors. Firstly, there is the ability to recognise changes in demand that could have an adverse impact on its operations quicker than its competitors. Secondly, there is the need for flexibility to respond to changes in customer needs and demands. Finally, there is the ability to understand its own capabilities relative to demand.

The perspective of the research being reported in this thesis supports Holt et al’s (2000) view, albeit that the above three points must be understood from the perspective of the customer rather than introspectively as is suggested in his work. In order to gain competitive advantage, the organization may have to demonstrate to its customer that by understanding those three things it can provide a better performance than its peer group.

Construction organizations themselves have not displayed this ability to demonstrate competitive advantage. For example, Love et al’s (2004) position is that construction organizations have failed to keep pace with the technological and social changes which influence their environment. In addition, they have been unable to understand fully their customers’ expectations and requirements as they have concentrated their marketing efforts in getting onto tender lists. This approach has taken precedence over customer relationship marketing which would have enabled them to gain such understanding.

Furthermore, major contractors have tended to align themselves with the customers’ consultants rather than the customer themselves, thus creating another level of communication to distance them further from understanding customer needs (Nesan & Holt, 1999). It is a postulation of the research herein reported that a LO would understand the customer relationship and cultural alignment elements and therefore be better able to align themselves with their customers’ needs. Indeed Love et al (2004) suggests that the best way for first tier contractors to realign themselves for
successful performance would be to embrace a degree of transformational change and implement a customer focussed strategy.

In addition, it has been suggested that the LO in the construction industry should be founded upon Total Quality Management principles in order to reduce the number of inherent quality failures (Love et al, 2004). New knowledge can be generated through the pursuit of quality. In that way the two practices can combine to improve the overall performance and customer focus of the construction organization (Ferguson-Amores et al, 2005).

Movements such as Total Quality Management and Business Process Reengineering are useful business realignment techniques. Neither should, according to Senge et al (1990, 1994), be employed without first implementing LO processes aligned to improving quality of performance to the customer. Without LO processes and customer alignment any such other programmes will not be sufficiently focussed (Senge et al, 1990; 1994). In addition, the business culture may not have been satisfactorily altered to allow a real difference to be made. In recent years, construction organizations have indeed tried to change in order to gain competitive advantage over their peers. This has often been done through a process improvement approach, usually Total Quality Management or similar, with little thought to the process of learning (Love et al, 2004). A process improvement approach, without the underlying foundation of an understanding of learning gives little consideration to how existing knowledge can be better utilized under the new processes.

Furthermore, the lack of a total quality management basis for learning within the organization results in a reactive stance when dealing with customers (Love et al, 2004). Lack of understanding of learning and its outcomes creates a culture of focus upon the immediate project and its economic status. Such a focus leads to a distant contractor–customer relationship which precludes the contractor from understanding the real needs of his/her customer and in turn being able to provide real value. The status of the relationship leads to contractors focussing upon differentiation by price which in turn causes further quality issues and customer dissatisfaction when trying to deliver with minimal resources in order to maintain profit margins (Love et al, 2004).

The proposition of the research herein reported, therefore, is that there is an opportunity for the implementation of LO principles in the UK construction industry. A
further proposition is that there also is an opportunity for organizations within the industry to be able to gain competitive advantage over their peer group if they can use LO processes to drive improved services to the customer (Love et al, 2004). Garcia-Morales et al (2007) makes it clear that being a LO is a long-term commitment and adds value in a way that, say, making short-term price cuts cannot. Love et al (2004) states that few contracting organizations currently appear to demonstrate the will to provide a LO environment.

Lack of will does not mean that contracting organizations are not learning, but it does mean that much of the learning done will be individual and thus not necessarily transferred into the organization per se. In addition, much learning is devoted to the detection and correction of errors whilst maintaining organizational norms. Little is done to change the norms so that fewer errors occur (Love et al, 2004). Senge et al (1990) postulates generative learning being a key element to maximizing synergy, thereby preventing errors and providing excellent performance to the customer. Generative learning is defined by Osterberg (2004: 145) as “the development and use of new organizational paradigms”. Senge et al (1990:14) defines it as “learning that enhances the capacity to create”. Both definitions refer to the creation of new ways of working for the organization.

Further to the internal LO question, there is the issue of how well contractor organizations understand their clients. An industry wide shift in strategy and vision from construction contractors generally is needed, as set out in Love et al (2004). A ‘customer value strategy’ may be a partial solution which will require a rethink in the approach to quality (Flint et al, 2002). This strategy will require a change in cognitive and emotional responses to the environment and the beliefs about ‘the way things should be done’. Love et al (2004), however, does not devote much argument to what the customers actually deem to be value; a limitation the research herein reported will address.

Furthermore, there is a need to expand the current body of research beyond that of recent papers such as Raiden & Dainty (2006). Raiden & Dainty’s work, for example, is based upon a single case study based around the Human Resources influence over LO capability. Indeed, Raiden & Dainty (2006) states that further work are necessary to establish whether her work might be applicable to the wider industry.

Following on from Garcia-Morales et al (2007) perspective, the research herein reported examines organizations which provide long-term excellent performance. For
the purposes of the research herein reported, a long term service is any service which extends for two years or more. The reason for this period is that, from direct observations, construction industry supply chain relationships take 12-18 months to reach their performing stage. It can be noted later in the research that this view is echoed by some customer representatives interviewed – such as the quote from Washington in 4.2.2.11.

1.2 The research questions

Given this contextual framework, the proposed aim of this research is to explore the following question:

*To what extent do excellent performing UK construction contracting organizations demonstrate and employ recognized LO processes?*

In order to be able to answer this overall research question, there are a number of sub-questions that need to be answered. These questions are designed so that the answers to them assist in the discovery of the answer to the overall research question:

*What do customers recognize as excellent performance from their first tier contractors?*

*What criteria may be used to identify those who provide better performance?*

*Which first tier contractors currently provide excellent performance?*

Answering these questions, and therefore the main research question, will provide an understanding of whether the postulated advantages of the LO actually do translate through to competitive advantage in the form of excellent performance to the customer. Furthermore, answering the questions helps to provide an understanding as to whether the concept of the LO has actually penetrated the UK construction contracting industry. If it has not, there may be further research required as to why not and whether such developments could solve the issues raised by Egan (1998, 2002).

1.3 Methodology

The research methodology is from a mid-point between the nomothetic and ideographic perspectives. For the perspective of this research, the definitions of these
two paradigms are taken from the guidance in Burrell & Morgan (2006). From a nomothetic perspective, the research herein reported is based upon a predetermined protocol and adherence to the canons of scientific rigour. From an ideographic perspective, the research herein reported aims to enter the everyday events of the organization in order to let the nature of that organization reveal itself.

From a practical perspective, and following the aforementioned definitions, it means that the research herein reported does not get fully inside any one or two organizations as now explained. A case study approach is utilized to facilitate the processes employed. The use of the case study approach requires interaction with, and potential influence of, the subject organizations. The reason that such a balanced approach to the research is being employed is that identification and understanding of a few key causal LO processes is required. As such, it is not necessary to expand the research to an exhaustive point whereby an understanding of the workings of an entire organization is acquired.

The philosophy of the organization and how it is constructed and operates, that is seen to influence this research, is most similar to that of Selznick (1948 as described in Burrell & Morgan, 2006); namely a structural functionalist approach. The structural functionalist approach takes account of both the human and organizational structure elements. This is the most useful paradigm for this research as the perspective on the LO itself is similar to that of Nonaka (1994) in that individuals create knowledge via cognitive mapping and social interaction which is made explicit through organizational processes. Selznick’s (1948) view brings together the formal and informal elements of the organization which work together.

Such a perspective allows account to be taken of the potential resistance from individuals to the LO process. It assumes a hierarchically and socially constructed organization to which individuals rarely submit wholly (Burrell & Morgan, 2006) but which frames their actions. This notion does, however, raise an interesting challenge for Senge et al’s (1990, 1994) position on Shared Vision within the best-practice LO. Shared Vision, in its purest definition, requires all employees to come together to align themselves behind the organizational vision. The theory then does not appear to accept those individuals not submitting wholly to the vision, which brings into question the realism of the LO model.

In addition, Selznick (1948) suggests the organism model of the organization as an analogy for its adaptive/shaping nature to its changing environment. Again, this
approach accords with the perspective of this research on the LO and much of the contemporary research. The organism model suggests that the organization adapts and responds to its environment and takes action to survive and flourish dependent upon its understanding of that environment. This is the same behaviour as a living organism in nature displays, and requires the researcher to view the organization as a sentient being.

From an epistemological perspective, that is the assumption of what knowledge is and how it may be discovered, the research follows a post-positivist standpoint. In-depth study, which involves gaining understanding as to the functioning of the processes uncovered within the organizations, is carried out (following Yeo, 2003). The methodological position is therefore within the functionalist paradigm. From the perspective of this research, this position is the most useful with which to approach the research. The intention of this research is to produce an understanding of LO processes for future use by construction contracting organizations.

The pragmatic approach of employing focus groups and interviews as the basis of the case studies is therefore advocated and practiced within the research herein reported. This is done in order to be able to gain the greatest understanding of the organizations being researched with the impact upon the case study organizations being kept to a minimum. These interviews and focus groups were augmented with the use of field notes, observations and review of documentary evidence (where they are made available).

1.3.1 UK construction industry

For the purposes of this research, the UK construction industry is bounded by capital construction projects carried out by UK based first tier contractors within the UK itself. This boundary therefore excludes projects carried out by UK contractors abroad. In addition, given the fact that all customers interviewed are ‘educated’ customers construction-wise with large programmes of capital works, the approach is likely to favour contractors who carry out large programmes of works. This limitation is accepted given the limited number of case studies required. Such contractors are likely to be among the best performers simply due to the fact that they are retained on such long running programmes by their customers.

1.3.2 Contractor
For the purposes of this thesis, all reference to the word ‘contractor’ refers to first-tier contractors working within the UK construction industry. A first-tier contractor can be defined as one with a direct contractual link to the customer and who is in general financial charge of a construction project with responsibility for managing other trades on site. This party is likely to be named as the principal contractor under the CDM regulations 1998 and be responsible for the health, safety and environmental risks whilst the project is being carried out. In short, it is the contractor who has legal and contractual possession of the site until it is returned at handover to the customer.

1.3.3 Customer

As with contractors, the customers are bounded as UK based organizations only. This does not mean that the contractor’s head office needs to be in the UK, but its programme of capital construction works must be managed from the UK. Customers who have large ongoing programmes have only been selected as they are more likely to understand what excellent performance means to them given the many projects undertaken.

This approach excludes customers who may build large one-off projects, notably developers. This limitation is again accepted due to the need for this research to understand excellent performance from the point of view of the most educated customers.

1.4 Structure of the Thesis

1.4.1 Chapter 2: Literature Review, Theory and Related Work

Chapter two deals with the extant literature. It is an analysis of what is the current position regarding the LO in the UK construction industry. This analysis is done mainly on literature where the authors have researched construction organizations to establish whether they possess LO characteristics. Some literature looks at these characteristics’ effects on organizational performance, but few examine the effect on performance to the customer. In addition, few are UK based.

Furthermore, the chapter examines the theoretical framework of the LO which is still largely built upon the seminal work of Senge et al (1990, 1994). Some of the work since then has departed from or augmented this model, but it would appear that none has superseded it as yet. Therefore the analysis within this chapter deals with identifying the key elements which potentially can be recognized within construction
organizations. This analysis feeds through to the model used for the data capture phase.

The analysis also looks into related disciplines, such as the Chaordic organization (Raiden & Dainty, 2006) which may or may not emerge in the research itself. The author brings these to the fore as they are secondary models within the LO literature. It was seen to be possible that, during the data capture and analysis stages of the research, they may become apparent and potentially be enablers or blockers to LO processes. Therefore they have been included in the literature review to give the reader enough of an understanding to be able to recognize their contextual nature.

1.4.2 Chapter 3: Research Design and Approach

This chapter deals with the design of the research which was in place at the outset, any changes to this approach and the reasons for those changes. This chapter is meant to give the reader an idea of the journey undertaken to complete the research. The original approach is that set out during the taught phase of the doctorate which, at the time was the map for conducting the research. It then deals with the changes that were either enforced upon the research due to external effects, or that were incorporated as improvements to the process that were discovered as the research progressed.

It covers areas such as the selection of the original customer organizations, how and why these were selected, and how this led to the selection of the case study organizations. The research methods are covered in depth, including the reasons behind their selection, and the use of NVIVO as the main data analysis tool.

1.4.3 Chapter 4: Data Collection, Analysis and Discussion – Customers

This chapter details the methods employed to collect the data. It includes discussion of the interviews carried out with the customer organizations and the case studies carried out on the first tier contractors. For the interviews, the detail as to exactly how the interview questions were arrived at is set out. In addition, how the interviews themselves were carried out is explained.

The data collected from the customer interviews is analyzed and organized into a revised framework for excellent contractor performance. This framework has been proposed to the wider industry as a system for procuring and managing contractors from an input perspective in order to improve the outputs of those contractors.
1.4.4 Chapters 5-10: Data Collection, Analysis and Discussion – Contractors

These chapters deal with the case studies carried out on the nominated excellent performing contractors. They outline the case study process and the questions used during the interviews and focus groups. Furthermore, a potted description of the organizations themselves is provided which gives the reader a sense of the nature of the subject about which they are reading.

Finally, the findings from the case studies are recorded and analyzed against existing LO theory. This analysis provides a basis for understanding to what extent the excellent performing contractors are employing LO processes. The analysis is based mainly around the framework provided by Senge et al (1990, 1994), but the analysis is augmented with comparison against research carried out up to the present day and from a range of sectors.

1.4.5 Chapter 11: Interpretation of results, conclusions and implications

This final chapter sets out the conclusions of the research behind this thesis and makes proposals for an update of Senge et al’s (1990, 1994) model to encompass the model of a contracting organization in the construction industry. Furthermore, it makes suggestions for specific additions and/or augmentations to the five disciplines set out in Senge et al (1990, 1994) which are necessary for the model to fit the construction industry. These augmentations may or may not be necessary for other industries with similar operating models to construction. In this way, the thesis is seen to make a significant contribution to the literature.

In addition, the final chapter sets out recommendations for future research that may be necessary to answer some of the questions raised within this thesis that are beyond its direct scope. There also are key points which are explored within this thesis which might have been included had extra data or time been available. These points are also noted as being potential avenues for future research.

Finally, due to the nature of this doctorate being twofold in its significant contributions, there are recommendations to the construction industry for change and adoption. These recommendations are couched in as practical a style as the understanding generated from the research allows. It is the profound hope that these recommendations are adopted at least by the participants in this thesis research and hopefully more widely by the industry once this thesis is in the public domain.
2 Literature review, theory and related disciplines

2.1 Introduction

This purpose of this chapter is to review extant literature relating to the research topic. The chapter provides an analysis of the two theoretical frameworks which underpin the research herein reported. The first key framework is an analysis of the concept of the LO and how this might translate into the UK construction industry. As will be seen from this section, much has been written recently about the LO. This chapter aims to bring relevant literature together in a meaningful analysis to provide a framework appropriate for an understanding of the research question (and its subsets) for the case studies conducted with the construction contractors.

The second key framework (in section 2.6) is the concept of excellent first tier contractor performance within the construction industry. This concept is analyzed in order to provide the framework for the customer interviews conducted as part of the research process and which will give the performance targets for organizations in the UK construction industry.

2.2 The Learning Organization – Theoretical Base

Much has been written about the theory of the LO since Senge et al’s (1990) seminal text. Some of these writings have used the UK construction industry as a backdrop and are discussed at length in this chapter. Senge et al (1990) suggests that the most successful organizations are LOs and that the ability to learn faster than competitors is the only sustainable advantage.

It might, therefore, be reasonable to assume that being a LO would manifest itself in excellent performance, given that this must be a key area of competitive advantage. One strong concept of the LO involves the design of the organization so that it facilitates learning (Holt et al, 2000). The key to the research undertaken for the purposes of this thesis is to uncover such deliberate design to establish whether that design has contributed to competitive advantage.

Senge et al (1990) proposed that five disciplines comprised what he deemed to be a LO. Those disciplines are: Mental Models, Personal Mastery, Shared Vision, Team Learning, and Systems Thinking. Senge et al’s (1990, 1994) seminal texts on the LO are still drawn upon heavily within the recent literature. The five disciplines have remained as the core elements of the LO. There are, however, some areas where the
contemporary research strays away from or augments Senge et al's (1990, 1994) model. With respect to such departures or augmentations of the LO model, this research will remain framed within Senge et al's (1990, 1994) five discipline model. The detailed reasons for this position are examined herein. In addition, critical discussion of the framework is not carried out within 2.2, but can be found later in 2.3.

2.2.1 Mental Models – theoretical base

Mental Models are the assumptions and accepted norms which influence the way in which individuals and organizations view and interact with the wider world. These assumptions are ingrained to a point where the individual or organization does not realize the extent to which they influence behaviour. Senge et al (1990, 1994) proposes that LOs need to reflect inwardly to better understand these assumptions. They need to expose their thinking to external parties to allow them to influence it in order for them to grow and develop.

Senge et al (1990, 1994) proposes that organizations must implement change at the institutional level to enable their individuals to develop fresh outlooks and learn new skills. This means transcendence of internal politics that creates the incumbent Mental Models that can undermine any attempt to create change through the other disciplines of the LO. One of the key elements is the distribution of business responsibility more widely while still maintaining an excellent level of coordination.

2.2.2 Personal Mastery – theoretical base

It is postulated by Senge et al (1990, 1994) that in order for the organization to learn, the individuals within it must learn. This is not to say that individual learning guarantees the organization will learn, but that it is an essential element. Personal Mastery is about individuals being in a continual learning mode not just in terms of skills, but also in terms of personal vision and spirituality.

It is not meant as a destination or an achievement, but is defined as a continual journey (Senge et al 1990, 1994). In addition, those individuals with high Personal Mastery have awareness as to where they lack competence and knowledge and where there is scope for growth. This is demonstrated in Senge et al (1990, 1994) as holding a personal creative tension which is the gap between a person’s current reality and their personal vision. Addressing this tension is the concern of the Personal Mastery journey.
2.2.3 Shared Vision – theoretical base

Shared Vision is described by Senge et al (1990, 1994) as the capacity to hold a shared picture of the future that the organization is trying to achieve. He suggests that creating a vision in this way will encourage innovation and give members of the organization the feeling that the organization is focussed upon the longer term. This vision is kept well distanced from the standard vision statement issued often by senior management within some organizations. If individuals are part of a Shared Vision, they are much more likely to want to learn and develop rather than be instructed to do so.

Senge et al (1990, 1994) further states that the vision must grow through a process of continual reinforcement. This reinforcement occurs through the interaction of individuals growing the vision organically and thus fostering enthusiasm for the journey towards that vision.

2.2.4 Team Learning – theoretical base

Senge et al (1990, 1994) describes Team Learning as developing team skills to enable it to create the outcomes which the team members want. This is the skill set element of creating the environment for individuals and groups to be able to work together as a unit. In order to achieve this, individuals need to learn as part of a team rather than just as individuals. Senge et al (1990, 1994) promotes the concept of dialogue over discussion to allow the team to gain greater insight into problems and opportunities. Discussion, he suggests, involves the advocacy of solutions without the exploration of the assumptions behind them, an approach that derails the learning process.

2.2.5 Systems Thinking – theoretical base

Systems Thinking is the concept of the LO which integrates the others into the coherent body of theory and practice. Systems Thinking addresses the whole and examines the interrelationship between the parts, thus providing the means to integrate the other disciplines. Senge et al (1990, 1994) suggests that one of the problems with management is that simple solutions are applied to complex system problems. Standard solutions tend to focus on organizational parts rather than viewing the organization as an interlinked dynamic process. Senge et al (1990, 1994) therefore postulates that Systems Thinking leads to more appropriate managerial action.
Senge et al (1990, 1994) further postulates that managers tend to think that cause and effect are adjacent in terms of time and space. This thinking has driven the behaviour that when faced with a problem, solutions that are adjacent in time or space are focused upon. In particular, actions that create improvements in a shorter time span are generally adopted. Senge et al (1990, 1994) argues that short term improvements can create very significant long term costs. Cutting the training budget, for example, can create cost savings, but can also severely damage the organization in the long term.

Senge et al (1990, 1994) suggests that the problem is the feedback received from the initial action. Some feedback is ‘reinforcing’ – where small changes build on themselves. In the example above, cutting the training budget shows an immediate fiscal benefit with no short term visible outcome; so the manager seeks to trim another budget and gets the same result. In the short term there may still be negligible impact on the organization’s performance, but longer term the decline in visibility may have a detriment to performance. This is an aspect of the delay which Senge et al (1990, 1994) suggests means that some significant consequences of an action are not felt until some time after the action is taken.

Senge et al (1990, 1994) proposes the use of ‘systems maps’ which show the systems and how they connect. It takes effort to recognize the systems and map them within an organization. Failure to understand systems can lead to blame and self-defence actions. As cause and effect cannot easily be seen, someone else must have caused the problem.

2.2.6 Leadership – theoretical base

Senge et al’s (1990, 1994) considers that leadership is a triplicate entity comprising the leader as designer, steward and teacher. The designer element involves the integration of the five LO elements which will initially mean setting up the governing principles such as values, vision and purpose. This means developing the Shared Vision in the first place and creating the learning processes to support it.

The steward element then has the leader being the steward of that Shared Vision as opposed to the owner. As such, the leader is responsible for, and committed to, the vision and therefore has the role of managing it on behalf of the organization. They have to ensure that they remain open to others’ visions and allow them to influence their own.
From a teacher perspective, the leader’s role is to assist individuals with acquiring the most accurate understanding of reality in order to improve their level of empowerment. Senge et al’s (1990, 1994) position is that leaders can influence views of reality in terms of events, patterns of behaviour, systemic structures and the purpose story. The most important of these to the LO are the systemic structures and the purpose story, and the leader must teach the organization to focus upon these areas. Gaining focus in these areas allows all members of the organization to better understand the bigger picture of the structural forces within the organization and gain an understanding as to what they wish the organization to become. As such it is not teaching in its strictest sense, rather enabling individuals to learn for themselves. The leader creates the creative tension which allows individuals to see the gap between vision and reality and understand how to bridge that gap.

2.3 The Learning Organization – Extension and Critique

Most of the attempted departures from Senge et al’s (1990, 1994) model still tend to fit well within the overall five discipline model. Senge et al’s model appears to be the most often cited text in most of the LO literature. In addition, most models appear to subscribe to Senge et al’s basic rationale for such organizations, arguing that in situations of rapid change only those that are adaptive and flexible will excel (Senge et al, 1990; 1994).

For rapid and flexible adaptation to occur, it is argued, organizations must “discover how to tap people’s commitment and capacity to learn at all levels” (Senge et al, 1990: 4). Furthermore, much of the recent research appears to agree that successful organizations are continually expanding their capacity to create their future, such as Japanese organizational innovation (Jackson & Debroux, 2008).

Within Senge et al’s model, real learning makes individuals and organizations able to re-create themselves. For a LO it is not enough just to survive. Survival or adaptive learning is important – indeed it is necessary. But for a LO, ‘adaptive learning’ must be augmented with ‘generative learning’, learning that enhances the capacity to create (Senge et al 1990:14). Such learning makes employees into agents of their own destiny, able to act upon the structures and systems of which they are a part. The LO, therefore, is able to shape its reality, by moving from reacting to the present to creating the future (Senge et al 1990:69).

Chinowsky et al (2007) has conducted a LO maturity survey using the LEONARDO model. This model provides a useful source of questioning for the process maturity
element of this thesis. This model does not, however, look at the process level of the organization but simply the diagnostic level, the implications of this are that the model is not useful to inform the process level examination reported within this thesis. It does raise a useful perspective which is incorporated into this thesis; that of the entity. The entity is that level within the organization where a particular characteristic can be observed at work (individual, group or organization). This characteristic becomes particularly relevant when examining how very large organizations group themselves in order to create a learning environment in the case studies herein reported.

Thinking in these terms assists the identification of how well ingrained into an organization a certain process might be. It must, however, be remembered that the LEONARDO model may have been developed as a commercial product and therefore Chinowsky et al’s (2007) work was critically discounted from forming part of the framework as there is the possibility that it contains bias. Furthermore, the model is American based rather than UK and therefore its underlying process and cultural biases may not be directly transferable.

Other research, such as Jimenez-Jimenez & Cegarra-Nevarro (2006) and Jashapara (2003) have taken a highly positivist approach to the research of the LO in the construction industry. Their approach generally has been to establish the presence of LO processes through surveys using Likert scale scoring and then to correlate the findings to organizational financial performance.

Their approach suffers from three limitations. Firstly, the potential bias of those rating their own organization on the presence of LO processes without the need to explain what are those processes. Secondly, not taking into account the performance of the market when assessing organizational performance. Thirdly not making an attempt to understand cause and effect issues. The studies reported in this thesis attempt to overcome these limitations and thereby make a significant contribution to knowledge.

Senge et al’s (1990, 1994) original processes have been enriched through some of the recently published relevant literature, discussed in the paragraphs immediately following. These have been grouped under the relevant five disciplines as defined by Senge et al (1990) to allow their findings to be used to identify the processes at work. It should be noted that these processes should be mutually supportive in order to be successful elements of a LO (Love et al, 2004; Senge et al, 1990, 1994).
A large part of this thesis is to identify those processes promoted in the theory at work in the day to day running of a construction contractor and/or alliance. The aim of this chapter is to identify the key elements which are looked for and how they manifest themselves.

2.3.1 Mental Models

Mental Models are tacit assumptions around which the organization acts and which frame the manner in which the organization acts. Therefore the Mental Models within an organization are displayed during interaction even when they are not obvious to the organization itself. Organizational actions will be taken based upon these tacit assumptions. Whilst the correctness of the actions themselves is sometimes challenged before, during or after the event, the assumptions themselves are much more rarely examined. Within a LO, these assumptions can be constructively challenged without organizational defensiveness appearing (Senge et al, 1990, 1994).

An environment where experimentation is encouraged to a certain degree will signify ability for the individual and group to challenge existing Mental Models (Goh & Richards, 1998). A LO can be described as a 'laboratory’ where people at all levels get to experiment to a certain degree (Holt et al, 2000). In addition, the failure of such experimentation is not perceived as failure, but as part of the learning process itself (Holt et al, 2000).

A LO will continuously challenge its own Mental Models to ensure that it is continually doing the right things to achieve its vision. This will be evidenced by the challenging of the assumptions behind decisions. Such behaviour will manifest itself in day-to-day meetings through the use of dialogue and inquiry as opposed to discussion and advocacy (Senge et al, 1990, 1994).

In practical terms, individuals will spend less time advocating and defending their position on an issue and more time exploring each others points of view about the issue (Senge et al, 1990, 1994). Ortenblad (2002) raises the obvious criticism that in order for Mental Model theory to work effectively, the assumption has to be that all members of the organization are able to interpret organizational routines in the same way to a certain extent and that such interpretation is unlikely in reality. Nonetheless, within a LO, individuals are freer to state what they are really thinking rather than what they think might be expected. This shift of expression is a key source of data and learning (Senge et al, 1990, 1994). It will be an enriching observation to note
whether all sections of the organization (e.g. management and delivery) view the operation and success of processes in the same way.

Coupled to this challenge is the actual use of data. In order to challenge successfully or create a Mental Model, data should be collected rather than assumptions made. A LO will collect data and analyze it in as unbiased a way as possible to establish, insofar as is possible, what is the extent of a situation. In a non LO, it can be observed that the conclusion and Mental Model are reached first and then the data are selected to fit that model (Senge et al, 1990, 1994).

Scenario planning is another commonly occurring Mental Model technique within a LO. Such planning involves examining various assumed scenarios of the future and examining the best ways in which to manage in those scenarios (Harrald & Mazzuchi, 1993). This type of preparation has helped frame the Mental Models of some of the most successful organizations in the world. The technique allows managers to understand the logic within their decisions before they are faced with the scenarios for real (Senge et al, 1990, 1994).

An organization skilled in developing Mental Models will also be recognizable through its approach to fiscal matters. A traditional approach to creating budgets would be the proposal of a number by one party which is then disputed by another party and in the end a compromise situation is agreed. It may be that both parties know that their position (and each others) does not represent reality; but everyone ‘plays along’ with the accounting game. A LO is more likely to ask those setting budgets to present their assumptions and areas of uncertainty to be dialogued in order to reach a figure (or more likely range of figures) which fit the likely scenarios (Senge et al, 1990, 1994).

Love et al (2004) discusses the importance of mindset within the LO in respect of gaining an understanding of it. He points to learning being a social process and that how the collective mind is developed through learning will influence the way in which tasks are carried out. He suggests that the appropriateness of the mindset developed will influence the success of the LO. Interpreting new challenges in the same ways will not allow the organization to evolve culturally (Argyris, 1993). Such understanding lead to the design of a line of questioning in the case study interviews about the social element of the organization and how that helps the organization learn.
Love et al (2004) also states that this social element entails the development of shared beliefs which overcome any existing mental barriers and allows mutual learning to occur. Such development would require the organization to manage the natural mental defences of the individual which will resist the change of the Mental Model to allow double loop learning and the development of the LO (Argyris & Schon, 1978). The behaviour of the individual is then linked to that of the collective within the LO.

Management needs to appraise individual behaviour critically to ensure that the appropriate Mental Models are in place to support the organizational vision. Such appraisal ought to be done through the examination of subconscious signals (Love et al, 2004); although there appears to be little information on how this could be done by managers who may not be experienced in such areas. Practices which come from the shared Mental Models should be reasonably visible, such as empowerment, mobilization and motivation. These practices should penetrate the organization from top to bottom (Holt et al, 2000). This position will be tested in the case studies where the consistency of employees’ views of the way each contracting organization operates will be observed.

2.3.2 Personal Mastery

Personal Mastery concerns the curiosity of the individual and can therefore be identified as present or absent in an organization by individuals’ attitude to personal development. In an organization which encourages Personal Mastery, people will actively pursue their own training which benefits their personal vision and that of the organization. When people are allowed to unleash their personal vision, they will be totally committed to keeping the learning alive. Such a notion, of course, assumes that the organization has given individuals the opportunity to understand and then articulate their personal vision.

A LO will be recognizable by its members being able to articulate their own vision, how they are pursuing it within the organization, and how well their personal development is aligned to that vision (Senge et al, 1990, 1994). The key point from this discipline is that of opportunity. Research looking at the ability of the organization to become a LO must focus upon the opportunities afforded to the individual within. Senge et al (1990, 1994) makes strong points about the curiosity of the individual, but without opportunity such curiosity will surely be lost. Examples of such opportunities are sought during the case study research reported in this thesis.
Personal Mastery cannot flourish without the right approach by management. The manager should assist the employee with understanding what his/her own personal vision is and where his/her current reality is in respect of that vision (Senge et al, 1990, 1994). Goh & Richards (1998) suggests that managers should take the role of coach and provide feedback to employees regarding problems and opportunities. Coaching enables a more empowering approach and allows employees to shape their own destiny within the realms of what will improve the organization. Ortenblad (2007) argues that the strength of LO theory is the flexibility it affords managers in its implementation.

Such an approach by management must be an important enabler for the LO. It appears to link well to the ‘opportunity’ element noted earlier. It flows logically that there is the opportunity for Personal Mastery and then the encouragement to embrace the concept. Obviously management cannot force their employees into such an approach, but encouragement would have to be present if an organization wanted to be called an active LO. Within the case studies the element of flexibility in employee actions in terms of shaping destiny is examined.

Love et al (2004) states that in order to be a LO, continuous learning at an individual level must be present. It is, despite the name, about the acceptance that you can never completely master things and that individuals accept this and commit to a lifelong learning state. Love et al (2004) also accepts that without individual learning there can be no LO. He takes the position that it includes routinized operations which are learned incrementally and non-routinized actions which are a source of radical learning as they require the individual to make sense of such operations.

Cors (2003) notes the key weakness with the whole principle of Personal Mastery is that it assumes individuals are willing to undergo the potential suffering that is often part of personal development. This notion appears to assume that the organization is adept at identifying individuals who already have a high level of Personal Mastery.

Goh & Richards (1998) emphasizes that the organization needs to support Personal Mastery by making available ‘training experiences’ rather than merely on the job training. The training should be of a type that develops behavioural capabilities rather than technical competencies which tend to have a shorter shelf life. The key point which links to Senge et al (1990, 1994) is that choice of whether and how the individual improves themselves is important. Ortenblad (2004) refers to this as a
learning climate where the important issue is the time and space for learning rather than the control of it.

A lack of Personal Mastery will manifest itself by people compliantly attending whatever personal development programmes are suggested. Following these programmes, behaviour may alter for a short time but will soon return to what it was at the pre-training stage. This happens as the individuals being trained are not committed to the training they are receiving (Senge et al, 1990, 1994), or the training is offered at an inappropriate time. Formal training strategy is examined in the thesis case studies with reference to how this training feeds the Personal Mastery element of the organization.

These positions of taking Personal Mastery away from the simple realms of ‘do what you do better’ into a behavioural realm is interesting. It suggests that the organization is developing its employees for real change rather than treating them as cogs in a machine. Given the pace of change in business in the UK, it appears to be a clear advantage to provide this type of learning to complement the tools and techniques type training which is most prevalent in the construction industry.

LO theory suggests that without Personal Mastery, it is unlikely that individuals will assist in developing the organization’s Shared Vision. Appraisals which concentrate on Personal Mastery should therefore be a key identifier of a LO. By extension, Personal Mastery also suggests that motivation by fear or punishment will be negated. Personal Mastery will act as its own motivator as individuals will be working towards their own vision (Senge et al, 1990, 1994). From this position, the principles of how individuals are motivated, or motivate themselves, to learn is examined in the thesis case studies.

A LO supporting Personal Mastery will also display a commitment to transparent communication processes. That is, there will be no barriers to people raising and solving issues to allow them to become more self aware and self confident. In principle, such a shift sounds simple, but Senge et al (1994) relates many anecdotes whereby senior individuals within organizations deliberately ignore the reality of situations. Rejection of reality manifests itself as issues which everyone knows exist, but which remain unspoken assumptions.

Alternatively, the organization commits to speak only the acceptable rhetoric and act as though that represents reality (Senge et al, 1990, 1994). Within the herein reported case studies, this issue will be identified through the comparison of the
opinions of senior management compared to that of employees. In situations where the rhetoric does not match the reality, cognitive dissonance sets in and individuals under these circumstances cannot operate at their full potential. The outward appearance of a LO, therefore, will be one where issues can be freely discussed and solved by individuals on their route to realize their vision (Senge et al, 1990, 1994).

The process of Personal Mastery involves individuals challenging their current assumptions. This sometimes occurs through dialogue with other members of the organization. The challenge to their assumptions can change their perception of the organization and the meanings to which they give observed events (Love et al, 2004; Senge et al, 1990, 1994). For this process to be successful, the individual has to be receptive to new learning and be given the opportunity to reflect upon it (Holt et al, 2000). This reflection is looked for during the case study work. Although it is seen to be difficult to question directly, the level of reflection afforded is identified through the discussions on personal training and learning.

Whilst the author accepts the theory which Senge et al (1990, 1994) proposes for Personal Mastery, it appears at first glance to be a little idealistic. The concept of ‘truth’ tends to be emotive and can be a matter of individual opinion. Undiscussable issues are a reality of business and in some cases issues which are not raised may be left this way for good business reasons. For example, the discussion in the media about whether the current recession has been brought about by the endless debates about recession is, ironically, a debatable point. Therefore it would not be a wise move for a business to discuss any inconvenient truths publicly to the extent that it might bring about the downfall of the business itself.

The structure of the organization needs to be correct to support Personal Mastery. If individuals within the organization try to pursue their own vision within a structure which blocks such an approach it is likely that they will move on from the organization to pursue their goals (Senge et al, 1990, 1994). A LO will redesign its structure in order to accommodate Personal Mastery and retain its most visionary thinkers. Personal Mastery is not something that can successfully be passed into the control of a human resources or training department (Senge et al, 1990, 1994). Goh & Richards’s (1998) work focuses upon the notion of the Strategic Architecture of the LO. He suggests that the organization should be flat, decentralized and with a minimum of formalized procedures. This position informed the later stages of the research, when it was noted that many of the excellent contractors possessed such structures.
Drumm (1995) notes the potential problems with such architecture, not least the issues of span of control, lack of central control and accountability. He suggests that a lack of central control can be combated through the provision of central supervision providing support to strategic considerations. The wider spans of control for the managers should be enabled through the selection of managers with a wider knowledge and ability set and the ability to self motivate. In addition, better interface management supported by Information Technology will be necessary to make such a decentralized structure work. Such a consideration created the question in the case studies of Information Technology support to the organizational structure in order to promote learning within.

A high level of Personal Mastery within the organization is also identifiable through the interdependent orientation which its members display. Individuals do not display an attitude that they are subservient to the system; nor do they feel they have total influence over the parts of the system by which they are affected. They display an understanding that they are part of a greater system which they can affect, but that affects them equally. Their behaviour reflects this understanding that they are an active part of a system which can provide their personal vision whilst they assist the system in achieving its goals (Senge et al, 1990, 1994). The position here suggested that the research underpinning the case studies herein reported must examine individuals freely exchanging knowledge and influencing change within the organization.

The structure and system are points which pervade much of the LO literature across each of the five disciplines. Interestingly, none of the research appears to suggest a best practice structure for a LO to follow. Goh & Richards (1998) is the only one who appears to come close, as noted above. This is probably sensible as there will be many drivers which dictate the organization’s structure. What is clear is that those within the structure need to feel that it is conducive to their Personal Mastery if this element is to be a success. The lack of a rigid LO structure was useful in allowing freedom to understand why the case study organizations adopted their structures.

Taking these perspectives from Cors (2003), Goh & Richards (1998), Love et al (2004), Ortenblad (2004; 2007) and Senge et al (1990, 1994), the key themes which present themselves as the main building blocks to the Personal Mastery element of the LO may be identified. A commitment to lifelong learning from the individual appears to be the catalyst for this element. This in itself, however, is not enough for an organization to possess a high element of Personal Mastery. The organization as a
whole must at the very least support such individuals and this is examined in the case studies by way of a direct semi-structured interview question.

2.3.3 Shared Vision

From Senge et al (1990, 1994), it is clear that a Shared Vision cannot be dictated by management and that all members of the organization must be given the opportunity to contribute to its development. It is also a given that the vision will not remain static; as the organization changes and the individuals who are part of it change, so will the Shared Vision change. In order for an organization to work towards its vision, the commitment of each individual is paramount. Commitment is at the crux of the Shared Vision principle, as individuals who have a vision, be it organizational or individual, thrust upon them are unlikely to give it their full commitment (Senge et al, 1990, 1994).

An organization which has a clear Shared Vision will tend to demonstrate that vision through a community-like atmosphere. When Shared Vision is present or being created, there is the presence of individuals freely discussing their personal vision and how it fits within the organization. Informal networks will be apparent around key issues within the organization, almost like communities of practice, although participation will be willing and voluntary rather than coerced. Such networks will tend to be more powerful at bringing about necessary change to the organization than can any managed change programme (Senge et al, 1990, 1994). Goh & Richards (1998) takes the position that a Shared Vision will link to employee empowerment. The taking of decisions by employees will enable them to support the organization’s vision through their own actions rather than how they are instructed to act. These positions developed the questions utilised in the interviews for the herein reported case studies on the cultural background of the organization in an attempt to understand whether there was some consistency between the excellent contractors.

There are many criticisms of the Shared Vision approach that Senge et al (1990, 1994) proposes. A Shared Vision negates the unique experiences of the individuals in the organization (Fenwick, 1998). Fielding (2001) argues that the theory excludes the possibility of a difference of visions by relying heavily on the dialogue process. In addition, the theory assumes that all conflict between visions can be resolved through the discovery of common interests (Brown, 1996). It suggests a free and open forum where disagreement, even with that of senior management, can be voiced openly and is encouraged (Coopey & Burgoyne, 2000). It was therefore necessary within the
case studies herein reported to enquire about the alignment of visions between the individual and the organization.

Raiden & Dainty (2006) uses the term 'organizational consciousness' to describe how the organization creates a collective vision in order to drive change. She suggests that this comes from the alignment of culture with organizational strategy and policy which drives a spirit for continuous improvement within the organization. Coherence between the formal organizational structure and informal culture, and between organizational goals and individual employee needs is central to Raiden & Dainty's (2006) view of the LO. The subject of coherence of culture and structure is therefore a direct question in the case study research underpinning this thesis.

Love et al (2004) too suggests a link between organizational culture and Shared Vision. Love et al's (2004) view is that of synergy developed through collective actions and shared understanding. Given a Shared Vision between separate parts of the organization, learning from one part of the organization can be disseminated easily across others (Goh & Richards, 1998). Culture is an interesting link to Shared Vision and this issue surfaces many times in the case studies herein reported despite there not being a direct question about the notion. The questions within the case study centred more on the functionality described in the literature such as the dissemination of learning.

It is also important that the sharing of learning and learning itself becomes part of the day to day process of work. The shared environment must be one where procedural revolution is kept to an absolute minimum. Love et al (2004) further points out that the structure of the organization must be such that it supports this state of affairs. He postulates that this would require finding a delicate balance between too little centralization causing a lack of direction and too much centralization resulting in overambitious targets. This was a further position which informed the line of questioning on the structure of the organization for the herein reported case studies.

A Shared Vision should be obvious during case study research as employees ought to be able to articulate the concept. In addition, they will freely state that they are committed to it and that they were a part of its creation. If individuals were not around at the creation of the Shared Vision, they will still be able to say that they have an influence over its continual updating. Senge et al (1990, 1994) appears to suggest that employees are excited about being part of the team because they can
align behind the vision. The commitment to the organizational vision and how it was updated informed development of the case studies reported in this thesis.

Furthermore, an organization with a Shared Vision will have a leadership model which operates at the co-creating end of the leadership spectrum according to Senge et al (1990, 1994). This will mean that a significant amount of leadership will have to be shown by the employees themselves. Individuals will be less reliant upon the titular leader for a telling and selling type of leadership (Senge et al, 1990, 1994). This should be one of the easier to recognize manifestations of a LO which can be identified through case study examination. The question of non-titular leadership is asked in the semi-structured questions in the case studies.

2.3.4 Team Learning

Senge et al’s (1990, 1994) position on learning is that no one type of learning is superior to another and both single and double loop learning are needed within the LO. The type of learning to best be employed depends upon the task itself and the environment in which it is undertaken (Love et al, 2004). It should be remembered, however, that Team Learning in itself is not a destination and does not have the goal of improving individual skills. It is more about making the team align better, function as a unit and think synergistically. Therefore, there is no single outcome of Team Learning, such as reduced delivery times, but an alignment of individuals which becomes self sustaining (Senge et al, 1990, 1994).

Armstrong (2000) critiques Team Learning on the grounds that the incentive to share knowledge with other individuals in times of high or looming unemployment is low. This is due to the presumption of competition for scarce positions within the organization. Ortenblad (2002) extends this criticism to a more radical point by suggesting that the theory therefore assumes permanent positions within the organization for all employees.

Organizations which employ Team Learning will display a greater element of dialogue than those that do not. This will come through in the form of meetings which do not hinge mainly around the traditional model of debate and decision. Team members will tend to use more dialogue, and the exploration of individuals’ assumptions, in reaching decisions. In doing this, individuals will first accept that they have differing views of a topic and examine the nature of the origin of those views (Senge et al, 1990, 1994). This position led to a case study question on the value of meetings within the excellent contractor organizations.
Furthermore, such dialogue will tend to be open between all levels and professions. There is a notable absence of ‘them and us’ or suspicion between different groupings within the same organization. Ideas will tend to be discussed on merit rather than on an advocacy basis based upon the rank and influence of those who champion the ideas. There will be an absence of one-upmanship during meetings and discussions (Senge et al, 1990, 1994). Chinowsky et al (2007, 2007a) views this as a cultural issue with receptiveness to new ideas and the support and encouragement for all to get involved in the ideas and change process being they key issues. The question of identification of good ideas is explored by some of the questions in the case studies.

Senge et al (1990, 1994) espouses several techniques and tools for excellent dialoguing, including the use of facilitators and good listening techniques. It is beyond the scope of the research herein reported to examine the presence or the use of this range of techniques. The aim of these techniques is to prevent the advocacy approach to discussing options and solutions and to encourage an inquisitive approach instead. Therefore, there will be no in depth examination of these techniques in this section as they are clearly set out in Senge et al’s (1990, 1994) work.

Suffice to say that a LO will use one or more of the dialoguing techniques suggested. What can be examined is whether any of the techniques are being employed and whether they are indeed driving Team Learning. This is researched in the case studies herein reported through the observation of team meetings.

Team Learning will also manifest itself in the absence of ‘pointless’ meetings. Teams which have learned to function effectively will have gone through a process by which they will have screened the performance of their meetings. This process will ensure that only issues important to the individuals and the team are discussed. Those which serve little purpose other than to take time and energy from the team are removed from the process. Meeting attendees may call for periods of reflection should meetings reach an impasse, thus avoiding the need for strong advocacy when opinions are divided. Meetings will therefore appear to flow well and work to the task from the point of view of an observer (Senge et al, 1990, 1994). The value of organizational meetings is therefore explored by the case study questions.

Furthermore, an organization with an advanced level of Team Learning will have few or no ‘undiscussables’. These are issues which everyone knows exist, but collectively decide not to discuss even though they may be the key to the progression of the
organization. Often, a formal exercise has been carried out in order to collect data about these undiscussables which has been externally facilitated in order to bring them to the surface and manage them out. In LOs, the culture pervading ensures that there are no undiscussables of note (Senge et al, 1990, 1994).

Other researchers (c/f Chinowsky et al, 2007, 2007a; Goh & Richards, 1998) have taken the slightly less dynamic perspective in that they suggest that the organization should remove barriers to communication. This is probably a more realistic approach than that of Senge et al (1990, 1994) as there are likely to be undiscussables at all levels of society to a certain degree. Given the depth of the case studies being undertaken it was not possible to identify the ‘undiscussables’ issue in the case study organizations. To identify such issues was beyond the scope of the herein reported research. This is a minor limitation to this thesis but not material to the understanding of the workings of the organizations in question.

A LO’s individuals will also tend to be clear about their role within the team. This role is not one assigned by rank or profession, but by an individual’s position with respect to a particular proposition or action. Senge et al (1990, 1994) describes four clear roles which people adopt at various times depending upon their position on a subject. They are: Mover – the person who initiates a position or direction; Opposer – the person who acts as a sceptic and challenges the mover; Followers – those who follow either the mover or opposer; Bystanders – those who critically assess and reflect upon the others. He makes it clear that all roles are necessary in order for a successful learning team.

It ought to be that when researching a LO, those team roles will be clearly visible and supportively functional within the team environment. In addition, the roles will not appear rigid and people will shift easily between roles depending upon their perspective on an issue. A LO will value the diversity of its teams and be aware of the way in which diversity improves the team. This type of diversity is an acceptance that without respecting the fact that individuals are more than just people who work for the organization, they will not be fully a part of the organization. Furthermore, it is clear that individuals must be made aware of their own personal filters when dealing with others and how that might affect their reactions.

The acceptance and self management of this element is a key part of an excellent learning team. Senge et al (1990, 1994) discusses this notion as being the abandonment of the expectation of how someone will speak and act and treating
them how they actually speak and act. This position again links well to the cultural perspective of Chinowsky et al (2007, 2007a). The issue of ‘culture’ is another explored in the case studies herein reported during the observation of team meetings and the messages from the interviews.

Acceptance of diversity will extend to the way in which individuals are asked to learn within the team. A LO will accept that individuals learn in different ways. Such an organization is therefore likely to provide a number of learning options to its employees to ensure that they get the most out of their individual learning experience. Senge et al (1994) provides an overview of these learning styles without going into the detail of how they might manifest themselves within an organization. The case study research reported herein contains questions on how personal development is supported within the organization.

Raiden & Dainty (2006) examines Team Learning from the perspectives of ‘flexibility’ and ‘continuous transformation’. Given the construction industry’s project based nature, the first tier contractor will often have to deal with different customer-specific specifications on each project it undertakes. In addition, each project almost requires the setting up of a temporary mini-organization around the project itself. These projects will be delivered through a variety of vehicles such as traditional competitive tendering and contracting, framework agreements, Public Private Partnership (PPP) and Joint Ventures (JV) to name a few of the more popular ones. Coupled with the relatively uncontrollable physical environment under which the organizations work, this situation means that first tier contractors have to learn to react to and solve problems as a team as they arise.

In addition, Raiden & Dainty (2006) incorporates the learning process as taken from Nevis et al (1995) and Huber (1991) as another LO process. This Team Learning process relies heavily upon double loop learning at its core. The new meanings uncovered by individuals during their Personal Mastery journey are disseminated through the whole team. This dissemination of knowledge changes the organizational norms and thereby assists a change in the culture (Love et al, 2004; Senge et al, 1990, 1994). The process therefore becomes one of collective reflection and reaction to the situations encountered which then become part of organizational memory (Love et al, 2004).

Single loop learning happens when members of an organization respond to their environment by detecting errors and correcting them whilst maintaining existing
organizational norms. This type of learning will not encourage any further inquiry or reflection. The focus is on solving problems without examination of the behaviour or the mindset that produced the problem.

Double loop learning not only deals with existing processes but also involves the modification of organizational culture, policies, objectives, strategies and structure. Double loop learning involves changing the organization's knowledge base, competencies and routines (Holt et al, 2000). By contrast, the concept of being able to implement single and double loop learning within the same organization is viewed by some as being too idealistic (Ortenblad, 2004).

There is also discussion on how a LO can be outwardly recognized without going into the underlying processes in great depth. This is useful to the case study element of this thesis as it informs the initial signals to identify. Raiden & Dainty (2006) suggests that a LO can be identified by its ability to reconcile the often conflicting elements of organizational and individual development; and formal structure and informal culture. She puts forward three elements which the employees might experience by being part of a LO. They are: challenging work; support and provision of opportunities for learning; and partnership between vocational education, formal training and informal Human Resource Development (HRD).

These three points are interesting and potentially logical manifestations of a LO. It will be potentially enriching to the studies herein reported to understand how and whether these things are mentioned during the author's case study phase and in what context they relate to Team Learning processes and added value to the customer.

From the literature, it is clear that Team Learning is something that must be driven as part of the LO. The point about no one type of learning being superior is useful as it is not so descriptive as to exclude the different forms of learning that might be needed in different business situations. Given the varying complexity of business problems that may be seen to exist within the construction industry, such flexibility gives the best scope for the creation of a Team Learning approach which can cope with these situations. Senge et al's (1990, 1994) position of more dialogue than discussion is a little less practical. Particularly given the current economic climate, it appears unlikely that the relative ‘niceties’ of dialogue are to be preferred over discussion. Nonetheless, it still appears from the LO literature that a move towards a
more dialoguing form of meeting should at least be a part of an organization attempting to be a LO.

The more practical points from the literature such as making Team Learning a journey, facilitating the movement of knowledge through the organization, and importing learning from without the organization appear to have a better chance of being a part of a tangible LO in the construction industry. They represent implementable processes that can be included within any organization almost regardless of the pervading culture. This understanding helped shape the questions asked in the interviews by providing a practical grounding to some of the more theoretical parts of Senge et al’s (1990, 1994) writings.

Furthermore, Raiden & Dainty’s (2006) perspectives are useful in that they are also relatively practical. A commitment to flexibility and the transformation of the organization can be implemented and identified. The key question from these points is that the flexibility and transformation are focussed in a way that transforms the organization to better respond to or manage its environment. The changes coming from these processes must demonstrably make the organization industry leading. In addition, the double loop learning process which is required for these changes can be identified through the three indicators Raiden & Dainty (2006) suggests.

2.3.5 Systems Thinking

A lack of Systems Thinking may seriously inhibit any move towards the state of the LO as Senge et al (1990, 1994) describes this discipline as encompassing the other four. A key element of Systems Thinking is the commitment of senior management to the LO approach. Senge et al (1990, 1994) and Love et al (2004) both state that whilst Systems Thinking has to be embraced by the organization as a whole, senior management must lead by example. They will need to implement a cultural change whereby senior managers lead by example.

An organization which understands system thinking will demonstrate it through their problem solving and opportunity taking processes. They will tend to map the impact of the issues and the proposed changes required to deal with these issues. They will try to model and anticipate the impact of these issues on the organizational systems directly or indirectly linked to the changes. The obvious criticism of this suggestion is that this might also be described as simply good management practice within a non LO rather than evidence of an ingrained Systems Thinking culture. Ortenblad (2007) notes that one of the weaknesses with Senge et al’s (1990, 1994) work is that it is so
all-encompassing that it almost becomes difficult to identify anything that might not be part of a LO.

As such, when researching for this thesis, it was important to gain an understanding of to what extent Systems Thinking was part of the organizational culture. In addition, in developing a best practice model for the LO in the UK construction industry, the real examples of Systems Thinking were seen to be worthy of consideration. Such examples were envisaged as those that lead to more intelligent decisions at every management level based on the operation of the whole business. It was considered that there would be fewer decisions made in isolation which impact negatively upon other departments. Such considerations may also be seen to extend to understanding the impact of their decisions upon their supply chain and client base (Senge et al, 1990, 1994).

Appelbaum & Gallagher (1997) suggests that Systems Thinking should be used to develop systems that make the organization more flexible and responsive to change. He suggests that many organizations do not live as long as people due to their inability to adapt to change. He includes the negative perspectives of a lack of Systems Thinking and what this means for the survival of the organization. Such issues generally involve individuals or groups within the organization ‘hiding’ behind the current system and using it to justify their actions. In this thesis’ case studies it was considered to be useful to identify how much of this type of behaviour exists within the best performing contractor organizations. This insight will provide an understanding of the ‘absence of LO negatives’ alongside the presence of positives.

The application of Systems Thinking will result in an organization that is still far from perfect in the decision making stakes. There will, however, be an absence of repeated mistakes and there will be less evidence of internal departments blaming each other for making their jobs more difficult. In addition, there will be less ‘quick fixes’ employed as it will be understood that these are likely to cause as many problems as they solve. Senge et al (1994) lays out five archetypes of how such fixes tend to backfire on organizations and how to diagnose and repair the consequences of such fixes. Again, as part of this thesis, evidence of such approaches will be examined in order to construct the best practice model for the construction contractor.

Systems Thinking is the understanding of the subsystems of the organization and how they interrelate and act individually and collectively to produce the results created by that organization (Holt et al, 2000). Raiden & Dainty (2006) describes this
understanding as ‘connectivity’ within her research and that it is found lacking within the organization which she examined. Raiden & Dainty (2006) states that the organization she was studying was divided into separate profit centres. This organization was only viewed in its entirety by those at top management levels. Her research conclusion was, however, silent on how this structure in fact creates the lack of unity she describes. Senge et al (1990, 1994) is not prescriptive about the ideal structure for Systems Thinking and therefore the LO and Raiden & Dainty (2006) does not link back to previous research to explain how she reaches her conclusion. Within this thesis, therefore, an open position about the best structure for a learning construction organization will be maintained when proceeding into the case study phase.

In addition, the organization should use Systems Thinking in order to align itself better with its internal and external environment (Appelbaum & Gallagher, 1997). Appelbaum & Gallagher’s (1997) position assumes an open system theory of the organization as opposed to a closed system. The open system is a necessary starting point of the LO as the organization must understand how it is connected to its world. The stance is critiqued by those who argue against the dichotomy of the internal and external environments, but Appelbaum & Gallagher’s (1997) perspective is the most useful to adopt for this thesis as the organization is the subject of the study rather than its place in part of the wider environment.

Love et al (2004) proposes that in order to transform the performance of the whole organization the critical path runs through senior management redefining the roles, responsibilities and relationships of all individuals within that organization. Senge et al (1990, 1994) makes it clear that any such realignment must be done with a view to the operation of the organization as a whole rather than the operation of individual departments, and that all employees and not just management should be involved. Love et al’s (2004) approach ensures that all departments maintain a stake in the new organizational structure as a whole and therefore have a chance to adapt systemically.

Love et al (2004) and Senge et al (1990, 1994) can both be accused of idealizing the process of business transformation. Both their perspectives are silent on the issues of unequal power and organizational politics which pervade organizational change (Ortenblad, 2007). Given that the herein reported research is of an exploratory nature, it is unlikely that such issues will be uncovered to any great extent. Therefore this oversight in the LO model will not be addressed within the scope of this thesis. It
will, however, need to be commented upon when developing the construction LO model.

Employing Systems Thinking also has the effect of making the organization more self aware. Assuming that the organization has a Shared Vision by ensuring that all facets of the business are aligned behind it would be a natural step. As such, the potential to over focus on one element of performance will be reduced. Love et al (2004) notes that whilst the quest to prevent quality failures is a useful cause, it cannot be driven at the expense of other facets of the business. Such a conclusion may appear at first to be rather obvious and easy to fit into the wide ranging concept that is Systems Thinking (Ortenblad, 2007). However, the ability to avoid such business process myopia is examined in this thesis’ case studies given the potential problems it may cause to an organization.

Learning loops are an important part of the Systems Thinking mix. It is unlikely that what is learned initially by an organization will be able to provide the ideal systems result. Learning loops provide insight into what has been learned, what its affect was, and what still needs to be learned (Holt et al, 2000). This suggestion would appear to be a practical application without which any organization would struggle to become a LO. The presence, or otherwise, and operation of learning loops is therefore specifically examined in the case studies herein reported.

Systems Thinking appears to be the most practically implementable of all the five disciplines in its complete state. Taking decisions holistically is something that any business should be able to implement. Senge et al (1990, 1994) appears to have identified a key behavioural trait which may separate the excellent organizations from the weaker ones. Organizations where two, or more, departments have misaligned or have conflicting goals can end up hindering each other’s progress. An example in construction might be a contractor’s tendering department being targeted with winning contracts; the project management department being targeted with keeping customers delighted. If the tendering department wins so much work that the project managers become too stretched, they may be unable to achieve their targets. This would in turn drive down the contractor’s reputation and make it harder for the organization to win or retain customers.

Furthermore, organizations should have a practical understanding of how their actions affect their environment. Some construction organizations can be contractually harsh with their supply chains, usually financially, which can cut the
number of suppliers who are willing to collaborate. Such a reduction in potential suppliers can then end up hindering them when their existing supply chain becomes stretched. This suggests that Appelbaum & Gallagher’s (1997) suggestion of understanding the organization’s position with respect to the environment also has a useful practical perspective for business excellence. This is a further area which is examined within the case studies in this thesis; that is, consideration is given to how the excellent performing contractor interacts with their environment.

The quick fixes noted by Senge et al (1990, 1994) as potential sources of greater problems than the ones they are designed to alleviate is another useful area when examining the construction industry. In the current recession, many organizations are, for example, cutting back on training and development of staff. This protects capital reserves but may have the effect of deskilling the organization as a whole for when the industry expands. In addition, it may reduce the loyalty which individuals feel to the organization, which may make it harder to retain them once the job market reinvigorates.

2.4 How the five disciplines informed data gathering

Each of the five disciplines of the LO requires an element of unlearning and adaptation to change. Changing existing Mental Models is perhaps the one where this is most relevant. Particularly within an alliance environment, the organization must move away from the hierarchical and rigid structure to encourage this unlearning. Indeed, the greatest unlearning will be behavioural in nature due to the cooperative approach of an alliance environment (Holt et al, 2000). It is for this reason that the workings and structure of the organization are examined in the case studies.

The experimentation perspective within this element is potentially interesting as the construction industry is not one seen to be particularly experimental with its service models. The traditional model for the industry has often been for experimentation in delivery to be driven from the customer position rather than the contractor. In addition, given the low margin returns, the allowance for experimental failure is slim. Therefore, whether this forms an integral part of a construction LO might have been questionable. It is however examined in the case studies.

The use of dialogue is another questionable position from a practical perspective. Meetings within the industry are based around advocacy, possibly from the adversarial nature of the underlying contractual models. In addition, data only tend to be collected when required and when needed to support a particular position. So
whether data are being collected in order to challenge underlying business models within the industry is questionable at this stage.

Scenario planning, however, appears to be a practical tool which can be implemented by organizations. Scenario planning involves learning about the future through understanding the impact of various driving factors (Senge et al, 1990, 1994). In fact, such tools may be used as part of the risk management process. Scenario planning is directly questioned during the case study interviews to establish the depth and breadth of the use of this management technique.

The organizational mindset perspective is an element which would have to be aligned in any organization if it was to change its Mental Model. It is also one that could be, and indeed appears already to be, driven by senior management to create tangible change in industry organization. Contracting organizations do change the way they project their culture to the industry. Such changes may be able to influence the assumptions under which the organization acts. Such assumptions and actions are revealed in the case studies through the use of various cultural indicators, such as the language used to describe the ways of working.

The organizational mindset changes within the construction industry may be practical through the changes in programme and project delivery structures. The move which the industry is undertaking currently from adversarial contract based delivery to an alliancing model is a practical example of mindset change. The growing popularity of alliancing signifies that the industry may indeed be trying to unlearn its past and move to a new mindset. Therefore this perspective may be a more useful one for changing Mental Models within the industry and thus the nature of business relationships is discussed in the case studies.

### 2.5 Related discipline – The ‘chaordic’ organization

The chaordic organization is a concept taken from Raiden & Dainty’s (2006) paper on the LO in the construction industry. Within this work, it is suggested that tier one construction contractors fit the quoted description of a ‘chaordic’ organization (p 64), described by Raiden & Dainty as:

"A complex and dynamical organization that operates in a complex, non-linear dynamic environment of which it is a central part."
The concept comes from a combination of chaos and complexity theory taking heavily from the principle that individuals employed by an organization act upon that organization and its systems whilst at the same time being an integral part of the organization and its systems. Raiden & Dainty (2006) goes on to state that much recent research has established the UK construction sector as dynamic and complex, the makeup of which is largely custom built individual projects.

In addition, the industry suffers from more widely fluctuating demand than other UK sectors which impacts upon geographical need for resource (Raiden & Dainty, 2006). The outcome of such fluctuation is that temporary organizational structures prevail which can often be remote from central leadership and management. Furthermore, whilst things never quite happen in exactly the same way on any given project, there is enough commonality of input, process and output to prevent the organization from entering disarray (Raiden & Dainty, 2006).

Raiden & Dainty (2006) goes on to say that the style of working and market landscape coupled with the high usage of a temporary and subcontract workforce creates a requirement for management to be more highly skilled and experienced in order to achieve project success. It would not be unreasonable to extend this proposition such that an organization facing such situations may have to become a LO to survive. The impact of the fluctuation of the industry and therefore the organizational structure and the effect this has on the business is discussed in some depth during the case studies herein reported.

2.6 Defining excellent first tier contractor performance

This section of the literature review is an analysis of how the recent literature has defined excellent contractor performance. This is not a central element of the LO research and as such is only touched upon in this chapter. The main reason for the analysis is to provide a framework for the customer interviews described later in chapter 4. As such what follows in these sections refers to the data gathering phase rather than serving as an analytical review of the literature around construction contractor performance.

In order to establish with the customer group which are the better and worse performing contractors, initial definitions of what elements represent excellent performance were used to frame the interviews. The following was seen to be a list of the contractor performance headings which come up in industry research (Egan, 1998; 2002) most frequently and which are used to define performance in the
research undertaken for this thesis. Each of these elements are tested during initial interviews with customer organizations to establish the final full definitions used within this thesis. The following is provided at this stage by way of a guide:

2.6.1 Time
An oft-stated bane of the industry is that projects rarely finish within their originally planned timescales (Egan, 1998; 2002). A contractor who can consistently deliver projects on time or can deliver them more quickly than his/her peer group could be highly valued. The quicker a customer can have his/her asset, the quicker he/she can generate income and profit. Lam et al (2007) provides an argument as to how time is best considered as the completion of projects within timescale, the reduction of the number of overruns, and the average duration of types of project.

2.6.2 Quality
Another area of variable standards in the industry, as noted by Egan (1998; 2002) is quality. The industry has been criticized for poor finished qualities of product. A contractor who can provide a quality product which requires a minimum of ‘snagging’ should be a high performer in his/her clients’ perception. Snagging is an industry term for defects correction that is carried out post the handover of the product to the customer. The quality of product tends to be the key point for which customers will return to a contractor. Lam et al (2007) advances two definitions of quality from previous works which is examined to provide guidance during the interviews. The word quality is an emotive and imprecise one and this area is the one most clearly defined by the contemporary research for discussion at the customer interview stage.

2.6.3 Capital cost
Capital cost is often viewed by customers, wrongly, as the only differentiator between contractors in the construction industry (Egan, 1998; 2002). It is, however, still a key element of contractors’ performance and those who can deliver at lower cost than their competitors provide added value to their customer. In addition, capital cost is no longer the only financial consideration; contractors who can deliver a product which is economic to operate will also add value to their customer. Chan & Chan (2004) proposes that customers will also consider certainty of cost and absence of variations as key performance elements. Such understanding informed the shape of the customer interviews conducted for the purposes of the research herein reported.

2.6.4 Innovation
An area criticized as being lacking in the industry for some time (Egan, 1998; 2002), innovation is a key issue for many of the author’s clients. If they cannot see excellent ideas and improvements, no matter how small, coming from their contractors then they may look elsewhere for services. Thus questions relating to innovation also were included in the interviews conducted for the purposes of the research herein reported.

2.6.5 Customer relationship

Customer relationship concerns the ease of working with a contractor. It has been observed that contractors who are achieving their ‘hard’ Key Performance Indicators (KPIs) can be replaced by the customer because of poor or aggressive customer relations/soft skills from key members of their team. Relationships can often depend upon how good a cultural fit a contractor is for a customer. Chan & Chan (2004) discusses such psychological success factors and draws upon earlier writers’ works to provide examples. Chan & Chan’s (2004) examples helped inform the discussions with the customers about contractors’ emotional commitment to the programme of works.

2.6.6 Health and safety

Health and safety is very much a focus of the industry since the passing of the Construction Design and Management (CDM) regulations in 1994 and their updating most recently in 2007. A poor health and safety record on site may reflect badly on the customer and customers do not wish to have their name associated in the press with major incidents on site (Egan, 1998; 2002). There have been many news articles in relevant industry publications such as Building Magazine in recent years referring to such incidents. Beatham et al (2004) points out that these incidents often form a key element of contractor performance criteria as there is a legal requirement to measure safety. This understanding provided a frame of reference to discuss the impact of health and safety upon the perception of contractor performance in the interviews conducted for the purposes of the research herein reported.

2.6.7 Sustainability and whole-life cost

Sustainability is a cause celebre in the national media at the current time and is also rising to prominence within the construction industry. Industry press, such as Building magazine, frequently notes that construction customers are increasingly aware that to be able to meet their own environmental commitments, their contractors must also be so inclined. One customer has recently stated during
organization meetings that he believes that company accounts will one day have to
measure turnover and profit per carbon usage in addition to financial terms. The
contractor who could bring design and construction solutions which improved the
sustainability and whole-life cost position for their customer tends to be well valued
element which is examined further for the customer interviews undertaken for the
purposes of the reported research.

All of the above elements appear in the Constructing Excellence forum’s
recommended set of KPIs (www.constructingexcellence.org.uk/zones/kpizone). This
group includes many of the larger construction customers in the UK and therefore
their output should be a reliable initial barometer as to what represents good
performance from the customer’s perspective. Many larger customers already have
adopted the above constructs as supply chain standard KPIs.

2.7 Conclusion

The contribution to knowledge and practice made by this thesis is to start to fill the
void between the theoretical works which have framed the concept of the LO (Argyris
& Schon, 1978; Senge et al, 1990, 1994) and the mainly positivist studies which
have followed (Bhatnagar, 2006; Garcia-Morales et al, 2007; Jimenez-Jimenez &
Cegarra-Navarro, 2006). The theoretical works have created a detailed framework
upon which the model LO is constructed; whereas the positivist studies have shown
that organizations which possess the LO processes and are close in makeup to the
theoretical model LO tend to perform better on such items as turnover and profit.

This thesis provides an understanding as to whether these processes really are in
existence within contracting organizations. In addition, there will be a greater
understanding of what direct impact a LO has upon the way the organization
performs from the customer’s point of view rather than the point of view of the
accounting data. The reason for choosing this approach is that figures such as
turnover and profit could be distorted by wider economic conditions which may drown
out the impact of the LO processes. Customers’ perspective of performance may be
less reliant upon the market and more reliant upon the organization possessing LO
processes.
3 Research Design and Approach

3.1 Introduction

This chapter discusses the research outline which was planned at the start of the research. It sets out the reasoning behind the original methods and what was anticipated would be discovered. It then demonstrates how and why the approach changed as the research progressed. This chapter has been included so that insight may be gained into how the research actually changed during its course as various problems, opportunities and learnings were encountered.

This chapter is divided into six key areas which give detail as to how the research was structured. Section 3.2 provides an outline of the research methods and key steps carried out within this thesis. Section 3.3 describes the initial work done in establishing a preliminary framework for excellent performance with respect to construction contracting organizations. Section 3.4 outlines the approach taken to researching the customers in order to understand fully what excellent performance means to them and to find out which organizations provide such performance. Section 3.5 is about establishing a framework of LO processes, but does not go into much depth as the bulk of this framework is established in the literature review in chapter 2. Section 3.6 then describes the case study process for researching the nominated contractors. Finally, section 3.7 describes the use of data coding and analysis – NVIVO as the data analysis tool for the research reported in this thesis. Section 3.8 provides the research design and approach leading into data collection and analysis.

3.2 Outline of the research methods

At the outset of the research an outline plan for the steps necessary to answer the research question was developed. Table 3.1 below, entitled process matrix of key milestones, and designed for the purposes of this thesis, shows the milestones that were anticipated during the research herein reported and the concomitant actions required to achieve those milestones.
Table 3.1: Process matrix of key milestones

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Action Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish a preliminary model for excellent contractor performance from the customer’s perspective</td>
<td>Examine key writings such as Egan (1998) and (2002) to establish key performance indicators for construction industry contractors.</td>
</tr>
<tr>
<td></td>
<td>Examine other contemporary literature about contractor performance in the construction industry.</td>
</tr>
<tr>
<td>Agree contractor performance criteria from the customer’s perspective (to inform the customer semi structured interviews)</td>
<td>Speak to Constructing Excellence Forum members regarding the performance criteria uncovered. Establish what excellent contractor performance really means to them given the key writings cited. Interview customers to the UK construction industry who interact with a number of ‘first tier’ contractors on a consistent basis and who view their capital construction spend as a significant part of business expenditure.</td>
</tr>
<tr>
<td>Researching the customers – semi structured interviews</td>
<td>Speak to Forum members and customers noted above to gain nominations for case studies. Nominations to be gained for contractors who perform excellently and poorly against performance criteria previously agreed.</td>
</tr>
<tr>
<td>Establish a framework of LO processes (to inform the contractor case studies)</td>
<td>Examine key writings to establish LO processes. Senge et al (1990, 1994) are the base texts used for this exercise.</td>
</tr>
<tr>
<td></td>
<td>Examine other contemporary literature about LOs and their financial performance (current positivist research). This provides research to follow that has already established how to identify LO processes.</td>
</tr>
<tr>
<td>Prepare data analysis and coding</td>
<td>Set up NVIVO coding structure in preparation for case study examination of contractors, based upon emergent themes from literature.</td>
</tr>
<tr>
<td>Researching the contractors – case studies</td>
<td>Research key members of the contractors nominated to establish the presence and maturity of LO processes.</td>
</tr>
<tr>
<td>Carry out comparative study of case studies</td>
<td>Make comparison between the case study organizations with respect to the presence and maturity of LO processes, thereby creating a theoretical model for the excellent performing construction contractor.</td>
</tr>
</tbody>
</table>
This chapter describes in more detail the steps and actions shown in table 3.1 and expands upon where changes were made to the initial approach. These changes were either from a practical perspective following the discovery of a more useful method of achieving the required output; or from an affected perspective, where events external to the control of the researcher required a change in approach.

### 3.3 Establishing a preliminary model for excellent contractor performance

There was first of all seen to be a need to establish a preliminary model for excellent contractor performance because a benchmark against which such performance could be assessed was required. In addition, this model was required in order to inform the customer interviews. An extensive literature review was carried out in order to develop an initial framework which would be used as the basis of the customer interviews. This was not done to bias the interviews towards a certain model for excellent performance, but simply as a prompt to be used in the interviews. It was anticipated that the customers would depart from the initial model and speak about what to them was really important.

This approach was chosen as it gave the researcher a framework based upon recent research already carried out and thereby a starting point from which new knowledge discovery could springboard. In addition, it was envisaged that it would enable the customers interviewed in the next phase to establish firmly in their own minds what excellent contractor performance means to them before they came to nominate excellent performing contractors for case study purposes.

### 3.4 Researching the customers

#### 3.4.1 Selection of Participants

Once the excellent performance models had been created, the customer interviews were the next step in the research. Initially, these were designed to be mainly for the nomination of excellent performing contractors for the case studies to follow. The establishment of a model for excellent performance was a secondary element of the research compared to the LO work itself. As it turned out, these customer interviews would uncover just as much of a contribution to understanding as the contractor case studies.

A purposive sampling approach was chosen for the customer interview element of the research (following Cresswell, 2007). Purposive sampling involves the deliberate
selection of members of a population based upon the researcher’s prior knowledge of that population. In this case the population was all customers placing work with the UK construction industry. Given the size of this population and the specialist nature of the information required, a random sampling approach of any description was out of the question. A random approach would have potentially included, for example, members of the general public employing a local builder to construct a garden wall. The author wanted to obtain as rich a data set as possible from the smallest possible number of interviews.

As suggested by Guarte & Barrios (2006), it is accepted that purposive sampling can be a source of bias due to the researcher selecting participants who would give the responses wanted. Therefore, the decision was taken to approach an educated industry body to nominate the customers for research. The original strategy was to approach the Constructing Excellence Forum to establish from their members what excellent performance meant. Unfortunately, this was not possible due to the vast amount of research already being undertaken by that body. As such, they felt that they would be unable to give the research the support it deserved.

As this research required the understanding of what excellent performance meant to construction customers, this step could not be abandoned. The author has critically examined some of the previous works on the LO in the construction industry (see chapter 2) and had critiqued that work on the basis that they were almost exclusively inward-focused. The author’s analysis was that most of that research was based on an assumption that the LO was a beneficial concept without discovering whether the organization’s customers noticed any change in performance (Love et al, 2000; Nesan, 2004).

Therefore it was decided to approach the larger organizations within which the author had existing contacts. Customers with large programmes of construction works were chosen as they were seen to be likely to have a lot of experience of dealing with tier one contractors and were considered to be the most likely to understand what excellent performance to them means. In addition, some were members of the aforementioned construction industry body. Given the size of their construction investment, the views of these customers can therefore be treated as being as valid as any other.

Approximately thirty customers were approached and six finally agreed to be part of the research. Thus, a snowball sampling approach was also utilized, following Welch
This means that those customers most interested in excellent contractor performance and the potential of the LO have probably been identified from this list. Such identification has always been the aim of the initial phase of the research. The six customers interviewed cover six sectors of the UK construction market. These organizations will not be named within this thesis due to the confidentiality agreements signed between the participants and the author. For the purposes of this thesis, however, the following customers pseudonyms are used, and these are listed alongside their nominated contractor for ease of reference:

<table>
<thead>
<tr>
<th>Customer Organization</th>
<th>Excellent Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minnesota</td>
<td>Chicago</td>
</tr>
<tr>
<td>Houston</td>
<td>Tennessee</td>
</tr>
<tr>
<td>Miami</td>
<td>Indianapolis</td>
</tr>
<tr>
<td>Oakland</td>
<td>Kansas</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>Cincinnati</td>
</tr>
<tr>
<td>Washington</td>
<td>Dallas</td>
</tr>
</tbody>
</table>

Fortunately, the six customer organizations who originally accepted were from sufficiently diverse sectors (finance, communications, information technology, retail and utilities) to allow the author to accept them without the need to approach further customers to diversify the sample. Therefore, the possibility of obtaining data representative of the industry views was greater and the trustworthiness of the data was improved. In addition, the number of participants, six, was viewed as being sufficient to give a wide range and depth of view. There was seen to be a wide ranging discussion in the literature of the number of participants considered appropriate for a study of a type similar to that herein reported. The number of participants for such research ranges from two to fifteen (c/f Cresswell, 2007; Flick, 2006; Silverman, 2006; Yin, 2003). As such, the author was satisfied with six because this satisfied the suggested number range and covered sufficient market sectors to be reasonably representative of the industry as a whole.

Most specifically, heads of property services departments were asked to participate in the initial phase of this study. They were approached as they were considered most likely to be the people who make the decision of who is included in their supply chain.
They were also seen to be most likely to have the best overview of their programme of construction works and its overall performance. They were also considered to be those organizational members most likely to be able to understand which of their first tier contractors provides the best performance.

3.4.2 Semi structured interviews

There is a range of interviewing techniques available to a researcher working within the chosen post-positivist framework. Those techniques include structured interviews, semi structured interviews, and unstructured interviews (Flick, 2006; Silverman, 2006). From this array of interviewing techniques, semi structured interviews were chosen for the following reasons.

The goal of the interviews used in the herein reported research was to identify a model for excellent tier one contractor performance, and which organizations are seen as is providing it (and therefore who would make the best case studies for the furthering of this research). Given that this piece was an entirely deductive piece of work, it was envisaged that the present framework for excellent performance held within the previous research could be utilized and a set of pre planned questions derived therefrom. In addition, the author could explore any areas of interest which arose during the interview and was therefore not constrained by the excellence model or the questions. It was decided that this was the best way to discover what was truly important to the participants and to avoid biasing their responses.

Following the guidance in Silverman (2006), face to face interviews were chosen over the other options of questionnaires, focus groups and telephone interviews. A questionnaire approach was rejected as it was considered that it would not be able to capture the depth of information required for this element of the research. An open question questionnaire that would capture the same depth would require an unfeasible amount of writing on the part of the respondent and was considered to be too time constrained for the participant. Further decision making processes are explained in the following paragraphs.

In addition, the author wanted to be able to see the reactions of the respondents to certain areas such that it would be easier to understand what to them was really important. It is acknowledged that this may be apparent from the words spoken, but it was felt that personal observation would enrich the information gleaned from the words alone. Furthermore, in the author’s experience, it is easier to gain rapport and the confidence of the interviewee when sitting in the same room as opposed to over
the telephone. It was therefore decided that the likelihood was that more information would be forthcoming in a live environment.

A focus group approach was rejected as the research was targeting one specific individual within the participating customer organizations. Heads of property services’ teams may have been able to add more depth in a focus group environment. However, the author wanted to know specifically what was important to the person making the strategy decisions on construction and therefore it was concluded that there was no need for the input of their team. In addition, the strategy of keeping to one level of participant was also seen to ensure that the level of influence of the participants was constant, thus increasing the rigour and trustworthiness of the data (Garcia-Morales et al, 2007). A telephone interview approach was rejected on the practical basis that they could be difficult to record without expensive equipment.

The participants were given an informed consent statement (see Appendix A) which made it clear that they had full control over this element of the research in terms of location (Flick, 2006; Silverman, 2006). The suggestion was advanced that the interviews took place at their own offices. This suggestion was made so that the author would cause minimum disruption to the working day of the participant. In addition, participants had control over the direction of the interview to a certain extent in terms of what information they divulged. The author had to accept the limitation that some information which the participants were in possession of may have been withheld due to confidentiality issues. There was also the possibility that participants gave answers that they thought the author wanted to hear rather than what they really wanted to say. Given the number of interviews, and the ability to cross-check answers against each other, this risk was considered minimal.

The participants were briefed on what the research as a whole was about and what precisely would be their contribution. The questions (below) were pre-issued verbatim, to the participants in order to allow them to gather their thoughts about the subject in advance of a meeting. In addition, the participants were informed that they would receive a copy of any papers written on the subject of excellent contractor performance which included information given at their interview. Such information gave them an idea of what they might receive in return for their contribution. Silverman (2006) discusses the ethics of ‘reward’ for participation in order to secure more participants. This offer was, however, merely an exchange of information in which both parties, researcher and participant, would receive knowledge from their participation.
3.4.3 Interview background (performance criteria) and questions

The case studies have been developed in conjunction with interested academics and customer representatives (following Garcia-Morales et al, 2007). This approach ensures that the questions are significantly rigorous for the study and that they discover the issues most relevant to customers. It is accepted that having the influence of industry leaders in developing the case studies may encourage them to add things which they are interested in rather than what is relevant to the study, thereby possibly adding bias (Garcia-Morales et al, 2007). This limitation was guarded against in this research through an element of controlled research development by way of literature review and academic supervisor influence.

Below in Table 3.2 entitled excellent performance factors, developed for the purposes of this thesis, is a list of tier-one performance criteria around which the customer interviews were shaped. The list represents an initial inventory of factors of excellent performance in UK construction contractors from the point of view of the customer and was gleaned from various research papers published over the last ten years. The list represents the key individual factors where excellent performance is expected which translates into overall excellent performance. It should be noted that the research itself included below is not solely UK based.

Participants were provided with the following list in advance of the semi structured interview in order to prepare them and stimulate the interview. Participants were asked to keep these factors in mind during the interview, but were told that they could depart from them, or set them aside completely if they so wished. This freedom gave the participants a greater amount of control over the interviews than if they had been fully structured. The factors and questions are as follows:

Table 3.2 Excellent performance factors

<table>
<thead>
<tr>
<th>Time performance (Yeung et al, 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Time overall (Bassioni et al, 2004)</td>
</tr>
<tr>
<td>• Time predictability (Bassioni et al, 2004)</td>
</tr>
<tr>
<td>• Of design (Martin, 2004)</td>
</tr>
<tr>
<td>• Of construction (Martin, 2004)</td>
</tr>
</tbody>
</table>

Cost performance (Yeung et al, 2008)

| • Cost overall (Bassioni et al, 2004) |
| • Cost predictability (Bassioni et al, 2004) |
| • Of design (Martin, 2004) |
| • Of construction (Martin, 2004) |

Quality performance (Yeung et al, 2008)

| • Conformance to specification (Yeung et al, 2008) |
• Functionality (Lam et al, 2007)
• Defects (Martin, 2004)
• Aesthetics (Lam et al, 2007)

**Relationship (Chan et al, 2006)**
• Top management commitment (Yeung et al, 2008)
• Trust and respect (Yeung et al, 2008)
• Effective communications (Yeung et al, 2008)
• Claims & disputes (Lam et al, 2007)
• Professional image (Lam et al, 2007)
• Drug/alcohol test results (Crane et al, 1999)
• Team satisfaction (Lam et al, 2007)
• Cultural alignment (Chan et al, 2006)

**Flexibility (Bassioni et al, 2004)**
• Impact upon customer business (Chan & Chan, 2004)
• Ability to manage ‘chaos’ from other sources (Lim & Mohamed, 1999)

**Innovation (Yeung et al, 2008)**
• Learning demonstrated (Lam et al, 2007)
• Value management (Crane et al, 1999)

**Health, Safety & Environment (Martin, 2004)**
• Health (Lam et al, 2007)
• Accident rate (Lam et al, 2007)
• Waste (Lam et al, 2007)
• Environmental complaints (Chan et al, 2006)

Source: developed for the purposes of this thesis

### 3.4.4 Interview questions

The following questions then loosely formed the structure of the interviews with respect to the factors in the table above:

- How would you rank and weight the above performance factors when you are assessing the performance of your current (or selecting new) first-tier construction contractors?

- How have you arrived at these factors?

- What do you understand the semantic interpretations of these factors, which are most important to you, to actually be?

- How would you assess performance against these factors for new and current contractors?

- What would you consider excellent performance against these measures to look like?
The excellent performance factors themselves were developed from the previous research, as referenced. At the interview stage, it was made clear to the participants before the interview formally began that this framework should not be considered a boundary. Participants were encouraged to speak about the issues that really mattered to them rather than feel tied to the factors listed. The list was merely to give the participants a prompt, which was based upon academically tested previous research, should they require. They would also, however, possess the freedom to set aside the text and speak from the heart if they so wished (following Yin, 2003).

The results of the interviews follow within the results and analysis chapter, chapter 4. However, the culmination of the interviews was a recommendation from each customer organization of the tier one contractor which provided the best example of excellent performance based upon the criteria important to each customer. The reason that this step was left until last and that the nominations for case studies were acquired in this way is that the exploratory research undertaken for this thesis is attempting to uncover whether a LO in the UK construction industry provides excellent performance through their processes. In order to understand whether this is the case, it was deemed necessary to first understand what excellent performance actually means to those who purchase from the construction industry.

This approach has also been taken in order to give this research a practical application. Much of the research to date has been quite theoretical with little emphasis upon what is the business driver for being a LO. This research is focussed upon what the actual benefit to the customer is of seeking out and employing a LO, and how best to recognize such an organization.

3.4.5 Interview procedure

Each of the six customer representatives was interviewed once, with each interview lasting approximately fifty minutes. The interviews were conducted at the business premises of the client, which enabled some clients to show the author pieces of confidential information which could not otherwise have been viewed. Before commencing the recordings, two copies of the confidentiality statement were signed by both researcher and participant. One copy was retained for the participants’ own files and one copy remained in the possession of the researcher.

In addition, it was made clear to the participants that the interview would be digitally recorded, transmitted to a third party transcriber and transcribed for my use. It was also made clear that no-one other than me, the participants and my thesis supervisor
would have sight of the transcription. Nor would the digital recording be made available to anyone but me and my thesis supervisor. The option was given to the participants to completely withdraw from the interview if they so wished at any point in the research process.

The questions were posed largely as set out above, but given the freedom the author had given to the participants, many of the interviews quickly departed from the text. The issues that arose are noted in the results and analysis in chapter 4. Furthermore, a broad question requesting any further points, opinions or questions surrounding excellent contractor performance was posed at the logical conclusion of each interview. This question occasionally yielded some further opinion and insight into customer views of their suppliers, which is also captured herein.

Some questions were asked in a different order than set out in the list above due to the natural flow of the interview. This was not deemed to be an issue as the order in which the questions were posed was not considered to be a key element of the output. In addition, the author found himself answering almost as many questions as the participants. This was due to clarification issues, contextual issues, or the participant wishing to understand what the author felt represented best practice in the industry from the current literature.

Where this latter scenario was the case, the author was careful to only put such input into the interview once all the interview areas had been covered so as not to bias the participants’ responses. This was handled by diverting such questions, as the author felt they might influence the participants’ responses, into an ‘any questions for the interviewer’ slot at the end of the interview. This in itself became an interesting discussion section which the author reviewed carefully to establish whether any useful statements which had not been ‘put in the participants’ mouths’ could be used in the research.

Just before this section, the author allowed an open section of ‘any further points the participant wished to make’. This was to cover any further areas not covered by the questions but that were important to the participants. It also afforded the participants the opportunity to revisit or augment any comments made earlier in the interview.

As soon as practical after the interview, the audio recording was transcribed and anonymized through the use of pseudonyms for the organizations named in the text. Copies of this text were then sent to the participant for review, potential alteration, and finally approval. No participants withdrew from their interviews, although some
made amendments to their transcripts to either remove business-sensitive data or to revise any estimations or approximations made during the original interviews. Such amendments were considered to be part of the ethical guidelines followed for participation and were not seen to detract from the quality of information obtained.

3.5 Establishing a framework of LO processes

Establishing a framework of LO processes was seen to be a step necessary for carrying out the case study work on the nominated contractors. The process followed was to use the framework of the LO as the basis for the case studies. The research then centred around attempting to identify and classify LO processes present within the excellent performing contractors.

It was decided at the outset of the research that the framework for LO process was likely to come from the seminal work of Senge et al (1990, 1994) and the work that has followed from others. The framework would therefore be based upon the ‘five disciplines’ set out by Senge et al (1990, 1994), assuming that it could be reasonably mapped on the construction industry.

The processes for examination were drawn from previous constructs utilized in recent research. Those processes are discussed in more detail in the literature review and data analysis chapters. The research is aimed at advancing the recent research from its current, positivist perspective which has looked mostly at statistical correlation relating business performance to questionnaire answers (c/f Bhatnagar, 2006; Garcia-Morales et al, 2007; Hsu & Pereira, 2006). The research herein reported comes from a post-positivist perspective to understand whether LO processes influence the organization’s performance from the point of view of the customer.

It became clear during the literature research element of the herein reported studies that the model would indeed fit the industry. As can be seen from the literature chapter there appears not to be a vast amount of work on the LO in the construction industry. The research which has been done, however, has either followed Senge et al (1990, 1994) or has tried to depart from it and actually ended up merely enhancing it. Therefore, there was no real departure from the originally planned strategy for this element of the study.

The questions used for the case studies developed from the literature research can be seen in Appendix B.
3.6 Researching the nominated contractors

3.6.1 Selection of Participants

The sample population for this element of the research is the UK construction industry supply chain ‘main contractors’; although only those with whom the customer has direct contractual relationships. These are commonly referred to as first tier suppliers within the industry. The reason for this restriction is that part of the value added through the supply chain may come from the interactions between customer and supplier (Egan, 1998; 2002). Given the nomination approach to sampling from this population, this can therefore be deemed to be a snowball sample (Creswell, 2007). This sample was seen to follow logically from the purposive sampling used to identify the customer organizations.

A snowball sample was deemed the most appropriate approach for this work as the author needed to identify the best performing contractors in the most convenient manner. It is accepted that snowball sampling has the potential to introduce bias, but given that only excellent performing contractors are required for this research, it was considered to be the most appropriate technique for this work (Flick, 2006).

While it is accepted that sub-contractors will also add value to the customer, they were excluded from the population for the purposes of this study. This decision was taken for two reasons. Firstly, to focus the research on one level of business respondent. Secondly, it was anticipated that sub-contractors would be less likely to form strong relationships with the construction customer due to their general need to contract through the first tier contractors.

Those main contractors nominated by the customers were examined through case studies to establish to what extent they were employing the LO processes noted earlier. The strategy of keeping to one level of participant – main contractors only – was seen to ensure that the level of influence of the participants was constant, thus increasing the rigour and trustworthiness of the data (Garcia-Morales et al, 2007). This approach was seen to parallel the customer interviews which were kept to one level of participant in the same way.

It has been argued that each case study should be bound in time and place (Creswell, 2007). As such, in this thesis, each case study was bound by the confines of the organization in question. Therefore, only individuals under the direct payroll of the main contractor being examined were chosen for interview. It was accepted that
bounding in such a way assumed that the organization was a closed system (Burrell & Morgan, 2006).

The contractors nominated by the customers were contacted and informed of the nature of the research and that they had been nominated as excellent performers. This was initially either done by the author or the nominating customer representative. The customers who made first contact generally did so because they were trying to emphasize their support for the research to the contractors. The telephone was chosen as first point of contact as it was considered more personal than e-mail and provided the opportunity to respond to any initial questions from the contractor. For each contractor, one or two key contact names were freely given by the nominating customer along with relevant contact details.

The potential problems and ethical issues of gaining access to organizations for the purposes of conducting field research (Alcadipani & Hodgson, 2009) was noted. As such, the same process was followed for making contact with each organization. The potential ethical dilemma was that the contractors may have felt compelled to take part in the research due to the involvement of their customer. At all times the contractors were made aware that participation was entirely voluntary and that they could withdraw at any time without penalty. This was made explicit in the informed consent statement, a copy of which can be found in Appendix A.

The initial telephone call to the contractor was followed up with an e-mail confirmation of the conversation and a copy of the research proposal paper written as part of this research study. This information was promised as part of the initial telephone conversation and it allowed the contractor to gain a full understanding of what the research was about and what it was trying to achieve. This e-mail was followed up with a further telephone call from the author to clarify any further questions and to gain confirmation of agreement to participate in the research.

The actual participants for the case study interactions were senior members of the contracting organizations who work on the nominating customer’s programme. The reason for this choice was because the aim of the research was to identify those LO processes which impact upon the customer in question. It was further pertinent to understand whether they permeated the whole organization or were just unique to those particular customers’ service teams. In addition, it was seen to facilitate an understanding of the reality between what processes senior management were trying to put in place and what was the reality at the service delivery point.
There was a disruption to the contractor research during this engagement stage of the work. In the time between the customer interviews and the initial engagements the current recession started to impact upon the construction industry. All of the customers who were part of the research began to contract the size of their programmes of works in response to cost cutting measures required by their wider businesses. Such contraction in turn impacted upon the turnover and profitability of their first tier contractors to a greater or lesser extent depending upon what proportion of their business related to this one customer. In addition, given the market conditions, it was likely that other customers of these contractors also reduced their investment.

There were impacts to an extent on all of the nominated contractors and all included in the research talked about the effects of the recession during the case studies. For example, all had to make redundancies and/or release consultant, contract and temporary staff. Whilst this information was not directly related to the study at the outset (the author obviously was unaware that such financial conditions would prevail), the ability to cope with the recession was commented upon. The methods used to cope with such disasters give an insight into the contractors' abilities to scenario plan and cope with huge enforced flexing of workload.

3.6.2 Case study procedure - generally

In order to reduce the risk of bias, the research conducted for this thesis was always intended to be carried out on a range of organizations and/or alliances, but not at too in-depth a level. Yin (2003) provided guidance used as a starting point for the case study element of the research: interviews, documentation review and personal observation form the bulk of the research methods. The analysis of the case study material was on an embedded analysis basis, as suggested by Yin (2003).

Carrying out multiple case studies across different organizations provided the case-based themes, which was seen to give the research a greater credibility. By definition, the method was therefore one of a collective case study (Creswell, 2007), where several cases were brought to bear on a single issue. The potential problem here was that the study could become unwieldy and unmanageable. This problem was guarded against through good usage of thesis supervisors to ensure that the mass of data acquired did not become an exercise in quantity over quality; and through regular reviews of the thesis writing as it progressed.
The final procedure for the case studies assembled was based heavily around the process envisaged at the outset of the research. The following was the process put forward to each contractor in a second e-mail communication:

- Digitally recorded semi structured interview with the CEO/principal of the organization – say one hour.
- Digitally recorded semi structured interview with the lead customer (who nominated your organization) contact. This assumes that this is a different individual than the CEO/principal – say one hour.
- Digitally recorded semi structured focus group with four professional members (e.g. project manager, designer, quantity surveyor, procurement) of the customer delivery team – say two hours.
- Examination of your written processes and procedures – say one day. It was made clear that this element of the works would not impact upon their business operations. This step was deemed unnecessary due to the depth of the information gleaned from the interviews and the quality of the written information supplied during the visits to the contractors’ offices.
- Observation of, and the opportunity to digitally record, one team meeting. During this meeting, the interactions between the business leaders were observed to establish how learning was exchanged informally within the organization.

The timescales stated above were an important part of the overall strategy for two reasons. Firstly, the time available to devote to field research was limited by the fact that the author was in full time employment. Secondly, the people proposed for interview were likely to be busy and therefore unlikely to want to commit extensive time to the research when they needed to be running a business in a time of economic instability.

The above time and process restrictions meant that a maximum of five visits were planned to each organization between February and November 2009. This meant maximum flexibility in arranging the visits which would allow them to be as convenient to each contractor as possible. The overall strategy was devised to balance the need to obtain research information with the need to make as minimum an impact as possible upon the contractors’ business. Such an approach was seen as more likely to receive acceptance of the research by the contractors.
The studies themselves took the form of embedded case studies (Yin, 2003). An embedded study was seen to be where the case study subject was not analyzed as an entire entity, but individual areas were studied separately with the potential to link the findings at a later stage. This approach was chosen due to the need to examine several individual units of analysis within an organization, such as the management team, the commercial team, and the project management team. The expected outcome was to identify key issues around the LO framework within each case and to understand common processes which transcended the individual cases and embedded studies.

A further source of data discovered for the case studies was process documentation (Flick, 2006, Silverman, 2006; Yin, 2003). Official documentation detailing any LO processes was the easiest to find, but the most revealing documentation was that which supported the day-to-day delivery model. Items such as historic client feedback forms, client workload allocation and internal organizational charts can all demonstrate how the organization has evolved its service to the client. It can then be established to what extent this evolution has been in line with model LO development.

### 3.6.3 Case Study Process - detail

The detailed process for carrying out the case studies themselves was developed from Yin (2003). The five steps decided upon were as follows. The first element was a semi-structured interview with the principal of the nominated business. This interview was designed to gain an understanding of the workings of the organization from the perspective of the person at the top. It was accepted that in some cases, particularly very large organizations, it was not always possible to gain access to the principal for the purposes of the study. Where this was the case, the most senior person possible was interviewed.

It is accepted that this does introduce the potential problem that having slightly differing levels of participant might introduce unevenness into the research. The author has attempted to guard against this as much as possible by approaching as senior a person as possible. Given that these individuals are all at or near the top of their respective organization charts, they should all be able to articulate the overall business vision relatively well. Given that the organizations in question are excellent performers, the author does not consider this too unsound an assumption to make.
The second step was a semi-structured interview with the main point of contact for the contractor team which dealt with the nominating customer. This was done to establish the link between the views from the strategic head of the organization and those of the strategic head of the customer delivery. The third step was a focus group with the customer delivery team. For this, the organization nominated individuals to be part of that group. Recognizing that such a method had the opportunity to create a biased response, a preferred cross section of individuals was suggested to the organization. This cross section included a project manager, a quantity surveyor and a designer – with other professions being optional, but with a preferred maximum of five in total. The fourth step was the observation of the same team (and possibly others) in a normal meeting which focused upon the nominating customer. This meeting was recorded with the permission of the team. The fifth step was an examination of relevant organizational documentation to establish a contextual background to the discussions based upon the common writings within the organization.

In reality, all of steps one to three and five were carried out in all six contractor organizations, but only two organizations were able to accommodate step four. Given the relatively low level of new information gleaned from step four within the two organizations which could accommodate, this was not viewed as a major weakness in the research.

### 3.6.4 Case study procedure - questions

Case study interviews were originally intended to be conducted around three question groups: Gateway, Lead and Lag. Gateway questions were used to examine what processes existed within the organization in the opinion of the participant. They followed the format of: “What is your process/policy/procedure for achieving x?” This allowed an understanding of whether, even if the processes existed in written form, employees were aware of them and used them. Lead questions examined the nature of the processes themselves and sought to understand how these various processes actually worked. Lag questions seek to understand what are the observed effects of these processes. These questions are along the lines of “How does this process improve your performance in the area of x?”. Gateway, lead and lag questions are standard research procedure for the author in his employment and have proven to be an excellent technique in gaining an understanding of an issue or process.

Note that these questions were all open, so as to draw out not only facts but also opinion and insight. Use of the word ‘why?’ was avoided unless absolutely necessary.
The wording of question can draw a defensive response rather than a constructive one. Yin (2003) gives guidance on this and other issues for carrying out a best practice semi structured interview and this guidance was used as a basis for the case study interviews. Views garnered from this line of investigation differed and provided a tapestry of insight into the workings of the organizations.

However, once the literature review had been completed, it became clear that examining the LO elements from this three question depth would be too onerous for a single study. As can be seen below, the questions finally settled upon for the case studies were sufficiently open to give depth around the existence, operation and effect of the organizational processes. Had each of these questions been asked specifically in three parts, the interviews and focus groups would have become too unwieldy to manage.

The questions asked in the semi structured interviews and focus groups were based around the Senge et al (1990, 1994) LO model and were as follows:

**Mental Models**

- How are employees encouraged to experiment within their service delivery to customers?
- What is the organization’s process for evaluating and implementing new employee ideas?
- What planning for potential upcoming scenarios is undertaken by the organization?
- What is the organization’s innovation strategy?

**Personal Mastery**

- How are employees encouraged to commit to lifelong learning within this organization?
- What support is available to those who do commit to lifelong learning?
- How can, and do, employees raise any problem issues from their perspective and implement solutions within this organization?
Shared Vision

- To what extent is there coherence between organizational goals and individual employee needs?
- How is the organization’s vision kept up to date?
- How do employees’ create internal networks or communities of practice?
- How is leadership demonstrated by employees other than senior managers?

Team Learning

- How does the organization motivate employees to share tacit knowledge and create explicit knowledge?
- What systems has the organization put in place to aid assist employees with knowledge sharing?
- How does the organization import learning and experiences from outside the organization by learning from other organizations and industries?
- How is the usefulness of internal meetings assessed with respect to what is being learned that can improve the business?

Systems Thinking

- How does the organization exploit the interconnections between processes and departments to improve the way the organization operates?
- How do you ensure that individual roles and responsibilities within the organization are aligned to the overall business vision?
- What learning loops are in place within the organization to ensure that lessons learned become implemented in service delivery?
- What is the procedure for implementing business or process change/improvement within the organization?
- To what extent is there coherence between the formal organizational structure and informal culture?
• How does the organization flex when confronted with changes in the business environment?

• How is benchmarking and measurement deployed to improve the way the organization operates?

The above questions were used during the interviews with the contractors’ CEO/chairman and the main customer point of contact. They were also used during the focus groups with the customer delivery team. The reason for the use of the same questions throughout was that the author wished to understand whether the processes being discovered truly permeated the organization. Furthermore, it was necessary to understand whether all members of the organization experienced the processes in the same way. In other words; whether the processes which organizational leaders professed as contributory factors to the organization’s excellent performance operated in reality.

Gaining an understanding of the processes at these three levels allowed the author to create a framework for excellent performing contractors based upon what actually occurred within these organizations. This understanding was opposed to any model which might have been developed from their leaders’ potentially idealized views of the workings of the organization. The idealized view of the LO has already been written by Senge et al (1990, 1994) and others and remains an aspirational target. This research provides the reality of the current best practice model for the LO in the UK construction industry.

3.6.5 Case study procedure - critique

It is an accepted criticism that the approach of doing multiple case studies dilutes the depth of knowledge which can be obtained (Creswell, 2007). This criticism is defensible within the realm of this study as a great depth of knowledge about each case in itself is not considered critical to understanding the processes at work. What was required was saturation of understanding about what the LO processes at work are and how they influenced excellent performance to the customer.

The aim of this research was not to provide an exhaustive insight into one particular organization’s implementation of the processes. Rather, it was to provide an overview of what LO processes were prevalent in excellent performing contractors and how they might be implemented by others to improve the performance of the industry in
general. In addition, the themes identified in the case studies were related to the literature which enriched the data and provided a framework for interpretation.

Case study research has been criticized for lack of scientific rigour (Yin, 2003) and this can been seen in some of the contemporary research on the subject area. Savolainen & Haikonen’s (2007) work on Six Sigma and organizational learning’s effect on organizational performance purports to be case study work. It, however, lacks much insight within the article into the methodology and data behind the conclusions drawn. By contrast, the research herein reported provides as great an insight as possible given the restrictions of time, money and research methods.

Semi structured interviews (Flick, 2006; Silverman, 2006) form the largest part of the contractor case studies, carried out from a phenomenological perspective (Creswell, 2007). By phenomenological is meant gaining an understanding of several individuals’ experience of working within their organization. The reason for this perspective was to obtain qualitative data from several individuals within each organization who have first hand experience of working with their service delivery processes.

The intention was to establish, insofar as was possible, the reality of the extent to which organizations employ LO processes. This approach of bracketing out a single phenomenon and acquiring several individuals’ understandings of it in order for the researcher to understand the nature of the phenomenon can be more specifically described as transcendental phenomenology (Cresswell, 2007). Transcendental methodology includes reducing the research into significant statements and then combining them into themes.

3.7 Data coding and analysis - NVIVO

The qualitative analytical tool, NVIVO, was employed to code the data based upon the categories noted previously. The author could then more easily look for significant statements and recurring themes therein. This information could then be subdivided to give a textural (what is being experienced with respect to LO processes) and structural (how are the processes being experienced situationally and contextually) understanding of the individuals’ experiences.

At the outset of the research, it was not assumed that the data collected would triangulate and support the same conclusions. Whilst data convergence was anticipated, there was the possibility that the evidence uncovered from the various
data sources would be divergent. This was an issue that the author considered at an early stage and was ready to deal with as the research progressed.

The underlying strategy for the coding and analysis of the data was that of using the current theory to provide the framework (Flick, 2006; Yin, 2003) in a deductive approach. As can be seen from the areas of questioning, there already exists a theoretical model about the potential processes which influence performance taken largely from Senge et al (1990, 1994) and subsequent research stemming from this seminal work. Yin (2003) states that perhaps the most difficult elements of the case study approach are the coding and analysis of the data collected. As such, he proposed a simple initial approach taken from Miles & Huberman (1994) which contains six steps to get the data into order for further analysis to take place. It involves putting the data into different arrays and then creating a matrix of categories within which to place the various data collected.

The theoretical headings which were used to formulate the interviews form the basis of the data analysis matrix and flowcharts. The data collected through the case study research was coded into the headings discussed in the literature review section. This approach allowed a code to be developed before commencement of the field research itself. In addition, such an approach helped keep a consistent framework running through the work. A deductive approach was chosen over an inductive approach for several reasons: firstly, given that the hypothesis was to test the presence of what was already a relatively well researched phenomenon in industries outside construction, it was felt that in order that this thesis could provide a level of comparison for the operation of the LO model in construction against other industries. Secondly, this thesis was based upon a theoretical discussion between the researcher and one of the participant customer organizations and therefore the research herein reported started with a theory and a hypothesis as its starting point.

It is accepted that part of the field research behind this thesis involves the observation of the operation of processes within the subject organizations, and therefore there is an argument that an inductive research methodology would have been an equally valid approach. An inductive approach does have the advantage of being open ended and allowing greater exploratory freedom, but was rejected based upon the lack of key advantages, set out in the paragraph above, which a deductive approach provides.
The risk with taking a deductive ‘pre-coding’ approach, however, was that the author may try to shoehorn data into one of the LO process headings rather than accept early on that there may be other factors at work (Yin, 2003). This risk was reduced by the fact that the theoretical framework was partly based upon existing research which already suggested the existence of the processes under study (Bhatnagar, 2006; Garcia-Morales et al, 2007; Skerlavaj et al, 2006). Following the establishment of a theoretical framework, the key categories were then placed into flowcharts and interdependency matrices and the frequency of occurrences of these themes could be mapped onto these charts.

NVIVO was used as the primary case study database as much of the data collected was qualitative in nature. NVIVO lent itself to easy coding and recoding as necessary as the data were collected. The bulk of the qualitative data were the interview transcripts and documentation, which could be coded relatively easily. Therefore the content of NVIVO was coded not only by the subject headings noted earlier, but by the source of the information itself. This aided efforts to triangulate the data collected within the theoretical framework.

Yin (2003) states that the database is an often ignored element of case study research which provides the background evidential data for the final report. In addition, the principle of being able to provide a chain of evidence which can be followed by anyone reading this work is adhered to as NVIVO allowed all data for this thesis to be visibly coded and linked (Flick, 2006; Silverman, 2006). Using NVIVO to provide this chain gives this thesis more visible credibility when read. Credibility is another key criticism of case study research (Yin, 2003) and the good documentation of the processes and research material should allow someone else to replicate this research should they so choose.

The author must also accept that research bias is inevitable within this work. The author takes the position that it is impossible to be completely objective about all aspects of the research. In addition, the mere fact that a researcher interacts with individuals during interviews and focus groups may mean that they are influenced in some way. This influence may be seen to be particularly evident as the interviews are not conducted in a fully structured paradigm (Flick, 2006; Silverman, 2006). The aim of this aspect of the research is always to remain as independent from the subjects under study as possible.
3.8 Research design and approach leading into data collection and analysis

The following chapters describe the data collection and analysis of the two stages of the research – the customer interviews and the contractor case studies. These will give the reader the practical application perspective of the research design described in this chapter.
4 Data Analysis and Discussion – The Customer Interviews

4.1 Introduction

Understanding what excellent construction contractor performance is from the perspective of the customer is an important area when attempting to improve the industry as a whole. Given that customers fund all works within the industry, it is important to keep abreast of what they expect from their first tier contractors. Previous works have largely centred around the achievement of quantitative KPIs and on the ‘golden triangle’ of quality, time and cost (Wang & Huang, 2006). In addition, much of the previous research has concentrated on large projects; whereas it is as important to understand excellent performance on a long running programme of works. Gaining such an understanding at programme level will inform contractors what ought to be their targets for continuous improvement over the lifetime of the programme.

This chapter analyses what excellent first tier contractor performance looks like and identifies who is the provider. It details the findings of the customer interviews, and reflects these against the previous research. The last section discusses the culmination of the interviews, which was the nomination of those six contractors, one from each customer, who demonstrated excellent performance.

4.2 Defining excellent first tier contractor performance

This element of the research is divided into those factors which are minimum performance requirements to prevent customer dissatisfaction and those which are excellent or differentiating and create customer satisfaction.

The factors have been divided by sections based upon the original framework used for the interviews. The analysis in each section demonstrates where this research either departs from, or enriches, the previous research reported in the literature. The overall aim of the data analysis in this chapter is to produce a relatively generic framework of excellent contractor performance based upon the views of the customer organizations interviewed. The original framework is retained to make the process of allocating the results in themes simple to understand (following Yin, 2003).

Whilst the themes themselves remain as the framework set out from some of the previously reported research, it will be argued that the perspectives and the depth
beneath the themes helps create a new paradigm. The results are this way grounded in the previous research, but extend and renew the thinking around these positions. This grounding in previous research improves the credibility of the study (following Yin, 2003).

4.2.1 Minimum requirements of contractor performance

4.2.1.1 Time performance

Yeung et al (2008: 282) explores a highly complex set of quantitative analyses to reach the conclusion that time performance is a ‘variation of actual completion time expressed as a percentage of finally agreed completion time’. Martin (2004) too emphasizes the predictability of time as being the key performance element under the banner of ‘time’.

Whether a programme focuses greatly upon time of output depends upon the customer's changing internal drivers. The strongest example of the importance of delivery time came from the customer from the retail market who suggested that having retail outlets open (or reopen) on time was of paramount importance. Opening or re-opening on time was of particular pertinence at the Christmas period where loss of sales could potentially be huge from a late completed project.

Customers interviewed for the research herein reported wanted the certainty that the handover date would be achieved, but were also interested in projects being delivered ahead of time. Some customers were happy with such an outcome as long as they could then make use of their premises and/or gain a financial return out of an early delivered project. An early handover of the project for a retailer was viewed as a bonus as this translated into extra sales. Washington’s Property Director stated:

"...suppliers that bring in the developments before time and assuming that quality and everything else is correct are pretty well regarded for doing that, if you can gain an extra sales week...”

In addition, they needed to be kept informed of an early delivery date well in advance in order to be able to take advantage of that new date. Given such a customer perspective, it may be argued that although the compliance with an end date was seen to be required performance, consistently beating it, whilst keeping the customer informed, was viewed as excellent performance.
What emerges in this thesis and may be seen to extend the work of Yeung et al (2008) is that customers who stated that time was the key output actually welcomed time variation, in terms of achieving completion before the agreed time. Therefore, it may be argued that the key measure of performance was a combination of time predictability and reduction in delivery time.

The research participants in the herein reported study also placed time as being the key output delivery factor ahead of cost and quality as customers were realizing the opportunity cost and potential gain of time saved in the construction process. This perspective also may be seen to extend Yeung et al’s (2008) work which appeared to focus upon the construction as the end in itself. It is here argued that a more commercially informed position is one which focuses upon a wider understanding of the impact on the customer’s business following the construction project. Time as a key performance element is therefore confirmed as a minimum performance output (of varying importance) by the customers interviewed for the purposes of this thesis.

4.2.1.2 Cost performance

Yeung et al’s (2008) research suggests that they key deliverable for cost performance is performance against original budget, as was concluded with time performance. Specifically he concludes that it is the metric of actual cost of a project as a percentage of the agreed price. Lam et al’s (2007) perspective is a little narrower being the completion of the project within the original budget.

Again, capital cost was raised as an output deliverable by the customers interviewed for the research herein reported. The key difference found within this research was that performance against a budget was not always the key deliverable from the customers’ perspective. Customers interviewed did make the point that predictability of cost was a requirement for their measurement against how their projects had performed within their KPI suite. However, when actually selecting contractors, lowest cost was the key driver, due to the construction department being ‘managed by the accounting department’. The ‘lowest capital cost’ driver does demonstrate a slight duality in the performance suite. Given the results of the research herein reported largely aligning with the recent research (Chan, 2006; Lam et al, 2007; Yeung et al, 2008) it is not proposed to examine this element of performance further as there is little extension or augmentation available from the interviews undertaken for the research reported in this thesis.
Two points, however, were repeatedly made during the interviews. First, predictability of cost was important at project level to ensure funding was managed well within the customer organization. Second, the key driver at programme level was often cost reduction to ensure that a predictable saving could be tracked and returned to the business at points in the programme. These two points extend the recent research on the strength that the participants were discussing programmes of works rather than projects.

4.2.1.3 Quality of product

Lam et al (2007) describes quality as the degree to which the project’s established requirements of materials and workmanship are met. He also suggests that quality can be expressed in terms of compliance with technical specification, function and appearance. Martin (2004) expresses quality, at least partially, as the project’s freedom from defects and minimization of the impact of any defects upon the customer.

Number of defects at handover point was perhaps the most consistent ‘output’ measure mentioned by the participants interviewed for the study reported in this thesis. It appears that the defect measure was important because all aspired to the position of having zero defects at handover point. However, from the interviews it appeared as if none of the customers was achieving such an outcome on their programme. It may be argued that such underachievement may be seen as likely to be due to the unpredictable nature of construction projects and the continuing issue that projects were not constructed under anything like controlled conditions.

The aspiration of zero defects was indeed a useful goal for driving behaviours and was clearly at the forefront of construction customers’ minds during the interviews. The likelihood of achieving zero defects on a programme of construction works, however, was in their collective opinion, highly unlikely. What would, however, set an excellent performer out from other first tier contractors would be an organization that did not have defects caused by making the same mistake more than once.

Interestingly, none of the customers interviewed currently measured their defects by the business impact of those defects. Although customers did confess that such impact would be perhaps the most important perspective on defects from their business’s position. Miami’s Property Director commented:
"…what we should probably do is say... I don't know, if one snag, was the front door wasn't there that would probably be more important than fifty snags you couldn’t see if you were a customer."

It was seen not to be done this way because of the difficulty of acquiring data to support a quantitative measure. Defects were generally measured by number and time to rectify by all participants interviewed. Whilst number and time outcomes were easier to measure it was unlikely to give the business the visibility of how they were affected by defects.

It may be argued that such a disconnect was an interesting extension to Martin’s (2004) work given the later discussion in this chapter about excellent performers really understanding their customers’ businesses. It was discussed in the interviews that an excellent performer would make a deliberate attempt to avoid one defect that would impact negatively upon their customer’s business. If such avoidance was done at the expense of two very minor defects, an ironic result would be the contractor incurring a worse KPI score for an intelligent action designed to protect the customer’s business. Exploring such disconnects between popular KPIs and what genuinely matters to the customer’s business was beyond the scope of this thesis, but needs to be borne in mind when establishing the true nature of excellent contractor performance.

### 4.2.1.4 Health, safety & environmental considerations; through employee health and site accident rate, reduction of waste and reduction of environmental complaints

Chan & Chan (2004) discussed excellent performance in health and safety as the completion of a project without major accidents or injuries. He noted the limitation in the industry standard method of measurement. Calculating accident rates required an accurate record of the number of accidents and the number of workers engaged on the project or programme. Such rates were seen as difficult to obtain where a complicated sub-contracting system and a rapid flow of labour prevailed.

Lam et al (2007) suggested that excellent performance for waste reduction could be identified by the difference between the amount of the total delivery of materials to the site and the amount of work completed. This metric appeared to be one of the more popular metrics used to measure waste in construction amongst the several employed across the industry. The finding was seen to be consistent with Chan et al’s (2006) position of demonstrating excellent performance through the reduction of
environmental complaints. Such complaints may be driven through the generation of excess waste.

Again, those customers interviewed for the research herein reported viewed these elements as minimum requirements. Many of them were now legal requirements for compliance, although customers may put more stringent compliance requirements on their contractors than were required by law due to their own internal policies. Such requirements tended to be the case in the environmental element rather than the health and safety element, possibly due to the already very tight health and safety regulations (CDM Regulations) already in force in the industry.

The elements of environmental complaints and waste reduction were discussed during the interviews, although not to the extent anticipated. Environmental complaints were generally considered from the perspective of the customer organizations’ own customers rather than the general public. In some cases these two groups were broadly the same. The key issue to the customers was again generally tied up in their contractors' understanding of their business, discussed later herein, rather than any quantitative measure.

Waste reduction was only really discussed by one of the customers, which was a surprise, given that the customer organizations interviewed were known to have a waste reduction policy. The opinion was offered that in the future all listed companies will have to report figures against carbon impact as well as financial expenditure. One analysis of the lack of discussion of the waste issue was that it had now become such a ‘given’ for all organizations to need to reduce waste due to media and popular pressure, that it was almost at the point where there was no need for such specific discussion between contracting organizations. This view may explain why such a seemingly important aspect of contractor performance was not brought up during the interviews.

From the analysis of interviews for this thesis, there was seen to be little, therefore, to extend the previous research in this area.

4.2.1.5 **An absence of claims & disputes**

Lam et al (2007) and Chan et al (2006) most recently placed a lack of disputes as being an indicator of excellent performance. In fact Chan et al (2006) suggests that such absence was a perceived benefit of using the partnering route to construction contracting. He noted that having researched various sectors of the industry, the one
(infrastructure) which used partnering most extensively was perceived as having the fewest disputes. He did not, however, define a dispute within his paper.

Claims and disputes were stated as not recognized or not experienced by the participants interviewed for the research reported in this thesis. It was not that disputes were dismissed out of hand; rather it would appear from the interviews that good communication may have replaced the need for dispute and litigation in these customers’ large programmes of works. First tier contractors who preferred a litigious route to deal with contractual and project problems were not welcome members of their supply chains. Other customers did not mention claims or disputes at all. Such reticence may allude to there being an absence of disputes and claims, but does not really touch upon the level and effectiveness of communication.

It may therefore be argued that this later finding may be seen to extend Chan et al’s (2006) work in that claims and disputes, once common in the industry, have moved through decline and to the point where they may now be seen to be the exception rather than the rule with the biggest customers.

4.2.2 Differentiators and demonstrators of excellent performance

4.2.2.1 Excellent relationships; through top management commitment

Yeung et al’s (2008) perspective that key performance may be shown by the percentage of top management attendance in partnering meetings may be extended. From the interviews conducted for the study herein reported, it was difficult to see how Yeung et al’s (2008) measure demonstrated excellent performance. Wang & Huang (2006) advanced his research from a Chinese perspective where top management relationships (or guanxi in Chinese culture) were of paramount importance to the perception of success in construction.

Percentage of management attending was seen to be an easily measurable metric, although having people in a room may not demonstrate commitment in the way it was described in the interviews for the study reported in this thesis. Attendees at meetings may not be committed, they may be disruptive in terms of trying to impose their views, or disinterested in terms of not demonstrating a cognitive and/or an emotional attachment. Therefore having the wrong type of people at top management level may actually remove effective performance from a contractor’s delivery offering.
Top management commitment was discussed during interviews as an intangible quality provided by the better contractors which was not measured in any clear way. Washington’s Property Director asserted:

”...top management commitment, absolutely, crucially important. If we can’t have a relationship with the principle director of that company...then quite simply it’s just not going to work...”

The research reported herein uncovered the need to purchase first tier contractor management capability as part of the overall package provided. Customers saw such commitment as adding value through the management of practical delivery and planning. In such a delivery model the responsibility for the delivery of the programme rested with the first tier contractors rather than the customer. It may be argued that such an approach will require a greater deal of first tier contractor management commitment than if they were simply delivering projects which were allocated to them by the customer.

This argument may then be seen to extend Wang & Huang’s (2006) position, even accepting that Wang & Huang’s (2006) position was from a different cultural background. Relationships and top management commitment did indeed appear to be key excellent performance indicators. Furthermore, top management need to bring not only commitment but also expertise for tangible benefits to accrue.

4.2.2.2 Excellent relationships; through emotional intelligence

Butler & Chinowsky (2006) sets the position that Emotional Intelligence (EI) and effective business leadership in the construction industry are positively correlated, and a model for EI is proposed. The model suggests five areas which leaders need to be proficient at in order to demonstrate high EI; these are: interpersonal skills, intrapersonal skills, adaptability, stress management, and general moods. Given that the work of Butler & Chinowsky (2006) is set in the construction sector, the model for EI used within this thesis will reflect this model.

EI was raised as a major differentiator between first tier contractors in terms of management commitment. Miami’s Property Director identified those contractors who treated the programme of works given to them as merely as "...just another income stream..." and those who were seen to have an "...emotional engagement to what Miami stand for". One customer suggested that similar engagement was one of the roots of first tier contractors understanding of what they want as a customer.
Furthermore, such engagement was seen to be a key input factor in creating excellent performance as the contractor could align themselves to delivering what the customer required from their overall service delivery package. It was considered that a less than excellent contractor would tend towards providing a standard service based upon what they were used to doing for other customers.

Stating an emotional attachment as a differentiator between contractors was seen to be an interesting perspective as it suggested an emotional commitment was being made by the contractor’s management. Such commitment was seen to be an extremely difficult element to measure but emerged from the experience the customer had in dealing with the contractor. Given the emphasis that the participant placed upon their point during the interview, it was clear that such commitment was clearly something they were looking for in their first tier contractors.

4.2.2.3 Excellent relationships; through trust and respect

Yeung et al’s (2008) understanding of trust and respect was measured using a Likert scale of satisfaction scores. Chan et al (2006) noted trust and respect as being a critical success factors in a construction partnering environment. He suggested that trust was critical for commencing a project or programme with a reasonable budget and programme. Ngowi & Pienaar (2005) noted the link between the level of trust in a construction relationship and the level of co-operation or competition undertaken by the parties.

Participants in the study reported in this thesis were noting an increasing ability to trust their first tier contractors with the delivery of the programme. In addition, they were becoming trusted to comply with key outputs without the need for customer intervention. For one participant, trust was seen to be a key element of excellent contractor performance. This participant was the same customer who stated that he was starting to impart trust to his first tier suppliers to deal directly with his own stakeholders on his behalf. Excellent performance in the trust area had removed a potentially wasteful communication step, thereby adding value to all parties.

It may be argued, therefore, that the research reported in this thesis may be seen to extend the recent research where trust reaches the point of customers not needing to examine and/or interfere in the delivery provided by their contractors. Trust and respect were seen to be what excellent performing contractors shared with the customer when the customer knew that his programme of works would be delivered without the need to worry. Oakland’s Property Director stated:
“Excellent performance to me is almost about not having to worry about whether those things [project delivery] are done.”

4.2.2.4 Excellent relationships; through effective communications

Yeung et al (2008) asserts that excellent communication is a requirement of excellent performance, suggesting a Likert scale measure of key stakeholders’ opinions of the effectiveness to differentiate contractor performance. Similarly, Chan et al (2006) suggests that effective communication is a primary strategic weapon in countering problems. He argues that the better communication that comes with a partnering approach helps to avoid disputes and contributes towards making partnering a more dispute free vehicle than traditional construction procurement.

Participants in the study reported in this thesis discussed performance improvements being a function of good dialogue between customer and contractor. They spoke of the detailed engagement required to establish long term development plans with their first tier contractors in order to achieve the goals of both organizations. Creating a formal alliance with their first tier contractors was seen to involve communication at many levels. Further, some participants stated that there was a need to engage with their first tier contractors as soon as possible in the project process regardless of the level of communication at the programme level.

Some participants further stated that effective and consistent communication was taken for granted within these construction relationships. In fact, many of the comments made about poor performers appeared to centre on the issue of communication. To some customers, the ability of the contractor to listen was a big differentiator between excellent performers and the rest. Miami’s Property Director suggested:

“[poor performers] think they know what I want and say ‘yeah yeah yeah, we’re listening to you’ but they’re not really…”

Ability to listen was an interesting perspective that appears not to have been discussed in depth in previous literature. The finding also strongly alludes to two way communication being a real differentiator, whereas previous research has tended to focus more upon how the contractor transmits messages to the customer.

Through excellent communication, excellent performing contractors were seen to show an aptitude for quickly understanding and aligning themselves behind the
message coming from their customer. As stated earlier, the output priorities may change (often from between quality, time and cost) through the life of a programme of construction works depending upon the needs of the customer.

Assuming that the customer was informed from a construction perspective and was able to articulate the message about what was important to them, the excellent performer was seen to be able to pick up that message and deliver accordingly. The excellent performing contractor was as much about customers giving the correct message as the contractor themselves interpreting that message. Other customers had stated annoyance at contractors who joined their supply chain and tried almost to dictate what should be important to the customer rather than listening to that message. It may be argued that such an outcome may again be seen to allude to the importance of two way communication.

One element of communication from contractor to customer which was seen to emerge as an indicator of excellent performance was the propensity to challenge the customer organization to improve what they were doing. Washington’s Property Director stated that contractors who acted as ‘yes men’ when the customer was making an obvious error were not excellent performers, adding:

*The ones that have got the balls to stand up and say ‘actually Washington that’s wrong, you’re doing that wrong, that’s stupid, that’s building cost in’. The ones that simply just do what we say we don’t place a huge amount of value in that...*

Lack of assertion was seen to be distinct from dictating what was important to the customer; it was seen to be more along the lines of acting as a consultant to help the customer deliver what was important without making a mistake whilst so doing. The finding again highlights the importance of a link between top management relationships and open and trusting communication.

From the interviews, it appeared that communication between customer and contractor had moved from being a vehicle for avoiding negatives such as disputes (Chan et al, 2006) to a proactive vehicle to provide consultancy. The view of more enlightened customers of ‘contractor as consultant’ was mirrored by the contractors. In the contractor case studies the point was made that the ‘old order’ of the Architect receiving most deference from the customer and the contractor receiving almost none was long gone.
4.2.2.5 Excellent relationships; through attitude and cultural alignment

Lam et al (2007) talks about satisfaction being a primary success criterion in terms of the happiness of the project participants. Lam et al’s (2007) position extends across all stakeholders from the customer to the subcontractors. Chan et al (2006) refers to a commitment to a ‘win-win’ attitude, but also refers to the commercial pressure which can compromise such a partnering attitude between customer and contractor.

Such satisfaction or attitude in itself was not raised in the interviews for this thesis. What was uncovered from Oakland was that excellent performing contractors possess a ‘commitment to constant dissatisfaction’ as indicated by the Property Director:

“...I’d also expect them to be committed to constant dissatisfaction; this idea that they may do a great job tomorrow, how can I do it better the day after?”

This comment suggests that satisfaction is viewed by customers today as a journey with perhaps no ultimate destination. One participant made it clear that excellent contractors are those who know that no matter how well they have done something, they should always be dissatisfied with it and look to perform better next time. This is not to suggest that customers wish their supply chain members to be unhappy in themselves.

One key observation here is that the perspective of the customer of satisfaction is that of ‘programme outputs’ which differs from Lam et al’s (2007) position of satisfaction being happiness in the job. It is entirely possible that the two are one and the same, but further investigation of such a link is beyond the scope of this research. It does however suggest that attitude towards performance itself is another element which customers are now looking at when considering excellent performance. Such a view takes a step further from Chan et al’s (2006) ‘win-win’ perspective, taking it more toward the tangible. It is not viewed as customers only wanting to work with first tier contractors who are the same as them in their outlook to business, but clearly it can help. There are several key attributes which have been mentioned during the interviews: a strong sense of integrity, the desire to create transparency in terms of their performance and their business, commitment to constant dissatisfaction, a strong desire to learn from other people, and an ingrained culture of relationship building.
On the cultural side, Chan et al’s (2006) position is that partnering for construction excellence relies partly upon a shared culture and approach to business without organizational boundaries. His proposal is that these should be brought out at initial partnering workshops which are likely to go smoother if the correct contractors are selected to begin with. He goes on to state that the whole industry needs to develop a better culture to focus upon delivering continuous value improvement. Kagioglou et al (2001) takes internal contractor cultural change as assessed through employee feedback as an internal performance success factor, but does not link it back to the customer’s culture.

The customers who organize their first tier contractors into an alliance delivery route mention the desire to learn and relationship building consistently. These customers understand that their first tier contractors are part of a community, or even several communities. How those communities work as stand alone and interlinked communities is vital to them successfully delivering the output of their programme. It appears that appropriate attitudes and behaviours are keys to making long term programmes and alliances successful.

It has become clear from this research that customers are looking increasingly for attitude and behaviour as deciders when they are hiring individuals for their organizations. There has been a departure from hiring on pure competency as there is an understanding that with the correct attitude and behaviour, competency can easily be trained in.

This was a clear position set out by the interviewees and it appears that rather than looking to develop the correct cultures in workshops; customers are actively looking for contractors who come to them with these qualities already demonstrated. Such behaviour is becoming evident in customers’ hiring of first tier contractors, as the questions being asked are beyond the traditional procurement question of ‘how many similar projects or programmes have you delivered?’ Obviously delivery is still important, but without the required attitude and behaviour they will not carry as much weight in the current market place. Excellent performance is therefore also being defined as an organization staffing its delivery team with key personnel with the required attitude and behaviour.

Following on from the attitude and behaviour perspectives, characteristics such as consistency of message, purpose, and ‘business personality’ were also directly mentioned by customers as characteristics of excellent performance during the
interviews. These issues centre around the potential disconnect between the message given out by the business leaders of first tier contractors and those who actually provide the service to the customer. Customers who take on first tier contractors based upon the message about what their organization can deliver can be disappointed by what the organization actually provides. Oakland’s Property Director stated that:

"...I have learned about suppliers, there tends to be, in some instances a big gap between the people you get coming in talking to you about what they can do and the people they then send along to deliver...”

The extension to the previous research (Chan et al 2006, Kagioglou et al 2001, Lam et al 2007) is that excellent performance in attitude and culture is simply about organizations keeping their promises. Oakland’s Property Director asserted:

"...delivery and accountability are not negotiable. They have to do what they say they do. They have to keep their promises."

Perhaps this assertion could be seen as a worrying identifier of excellent performance as it suggests that the norm is for the construction industry to promise more than it can deliver. The disconnect appears generally to be between the delivery levels promised by contractors’ senior management and the actual delivery provided by the organization. This ‘credibility gap’ appears to suggest a break in communication within the contractors as organizations. Either management are not grasping the complexities of what the delivery staff have to do, suggesting a two-way communication problem; or there is a culture of over-selling within the industry. The excellent performing contractor, therefore, will have to ensure that no such credibility gap exists.

4.2.2.6 Professional image or the maintenance of the customer’s image; requiring an in depth understanding of the customer’s business

The recent research has been relatively quiet on the subject of the image projected by the contractor whilst he/she is working for the customer. Lam et al (2007) and Chan et al (2006) touch upon it as a potential KPI or performance measure but do not discuss in great depth. This is an interesting oversight given the high priority customers interviewed for this research gave to 'image'.
This suggests that a predominance of construction customers are understanding that those organizations they contract with that are visible to the wider public are being associated with them in the eyes of the public. Miami’s Property Director advised:

“...[the contractor] produced a 3D visual of what this new Miami was going to look like for ourselves. They built a little hut, almost like a bus shelter inside the hoarding, put a flat screen TV in there and they were putting on a loop what the Miami was going to look like...for [Miami’s] customers”

If their construction contractors create poor publicity for them then there is the potential that this could impact upon their own business. This discussion during the interviews tended to lead into a point of view about excellent performing contractors being those that most deeply understand the customer’s business.

Beyond providing delivery of a construction programme, the excellent performing contractor will tend to take account of the customer’s wider business. Miami’s Property Director stated:

“I want [contractors] to be retailers first and actually know how to build a Miami second...”

A key deliverable will be for the contractor to safeguard the customer’s reputation and interaction with his/her own customers. Interaction is especially important if those customers are the general public, even more so if the interaction is in a face-to-face environment, such as high street retail. Some construction customers are even going as far as to educate fully their first tier contractors on their own strategy for interaction with their own customer base.

What these construction customers consider as their own customer base varies from the public, to large external organizations, to other departments within their own organization. The business risk to the customer of allowing this interaction between his/her contractor and his/her stakeholders is acknowledged. Therefore, excellent contractors will be those who understand their customer’s business well enough to be able to handle that interaction to the same standard as the customer him or herself. In addition, allowing this interaction enables the customer to extend the interaction with their first tier contractors so that all understand the goal to which the programme of construction works is aligned. It also removes a potential problem intervention from the customer if they can trust their contractors in this way.
The element of understanding of the customer’s business has been greatly emphasized by participants from retail outlets who stated that excellent performing organizations needed to be retailers first and contractors second. The point being made is that whilst the construction works are necessary, the customer wishes to maintain their own image with the public. Image maintenance becomes difficult during such works as Miami believes that some contractors give the impression to the public of being "...hairy arsed builders...". What construction customers require is a contractor who will act as if they are an extension of their own business and maintain the same pride in that business. Oakland’s Property Director asserted:

"The issue for me is the ability of the provider of the service to understand what those [Oakland business] fundamentals are...”

An understanding that first tier contractors are an extension of their customers’ business appears to be the one area where first tier contractors can bring innovation to bear as well. Customers interviewed for this research became visibly animated when talking about such issues. Contractors who seem to always go beyond the call of the contract and project scope to ensure that the customer’s stakeholders are delighted appear to be most highly regarded. Customers generally have no KPI for contract exceeding behaviour as such things are described as hard to measure. Given that customers used examples of this type of behaviour to illustrate to the author the gap between excellent performing contractors and the rest, indicates that the lack of a current defined measure or protocol is interesting and may be worthy of future exploration.

4.2.2.7 Flexibility – through being able to minimize the impact of construction upon customer business and the ability to manage ‘chaos’ from other business sources.

Given that flexibility was mentioned by many participants in this thesis research as being one of the top behaviours they needed from their contractors, makes it somewhat surprising that it does not feature very much in the recent research. Chan et al (2006) mentions a lack of flexibility being a problem to implementing partnering arrangements, but Chan et al’s (2006) view is from a public sector customer perspective. Atkinson (1999) discusses the management of projects in itself requiring flexibility, but does not examine it in depth. Crane et al (1999) has flexibility and responsiveness as part of mid level (between outputs and relationships) performance profile measures. Beatham et al (2004) discusses the ‘Satisfaction of Service’ KPIs developed by the top intelligent customers of the construction industry which
included flexibility within its measures. Further research reveals that the website for this set of KPIs (www.soskpis.com) no longer exists so it is difficult to establish what happened to this tool.

According to participants, flexibility and agility, whilst becoming central requirements of excellent performance, are elements that cannot be delivered immediately. Almost as if trying to turn a juggernaut, customers appear to understand that a period of time is required between their change in message and the change in direction from their excellent first tier contractors. Customers have stated that if they explain what they want done differently on the programme they expect excellent performers to be able to respond within a reasonable time.

Conversely, a prolonged inability to respond to a changed message may result in churn, which shows how important this performance factor is to customers. Flexibility and agility are also required in order for the contractor to be able to successfully flex to the ebb and flow of work during a long programme of construction works. Flexibility is clearly necessary as some of the customers' programme spends are being reduced significantly during 2009, for various reasons. From the interviews, it is clear that the ability to flex when workload increases significantly is also required of excellent performers.

The fact that flexibility appears to be in the forefront of customers’ minds gives credence to a statement made during the interviews: If you measure first tier contractor delivery by the more ‘traditional’ measures of time, cost and quality – you are only measuring a snapshot in time. Which of the three is at the forefront will change as the customer’s own business drivers change and good flexibility is what will give the ability to respond to that change. It could be speculated that what has caused the problems reported as endemic in the construction industry (Egan, 1998, 2002; Latham, 1994) is the tendency of customers to select suppliers on lowest cost tenders based upon that snapshot in time.

At the point of tender, the contractor who priced lowest was offering to do the work at that point at the lowest cost. However, this price will give no guarantee that as the programme requirements change, cost will be the main driving factor, or that the contractor selected on that basis will be able to react to change successfully. Oakland’s Property Director stated:

"...if you explain what you want to try and do differently and you give people a period of time to respond, if they can respond then you retain them."
There is also no guarantee that the lowest initial tenderer will be the cheapest contractor following any programme change; even if cost is still the greatest driving factor from the perspective of the customer. This might be a particular issue where the contractor has design responsibilities and can influence the extent of scope as well as the price of the individual scope items.

The position set out in the previous paragraph gives further weight to the opinion that looking at a set of KPIs will only give a thin slice in time view of the performance of a contractor. Therefore the only way to identify continually excellent performing contractors is through looking at input factors rather than outputs.

The excellent performing contractor will also understand that no customer actually wants a construction project; they want a finished product with as little hassle incurred as possible in getting there. Construction customers have noted during the interviews that the construction of their business premises is subservient to the operating of the business itself. Therefore the potential savings made by employing a contractor on the basis of price alone may be more than offset by the impact upon the customer’s business. Miami’s Property Director said:

“…running a Miami is like running a marathon every day, it’s really quite a tough thing to do. And my team are in there, doing heart-and-lung surgery while you’re still running the marathon!”

The above quote gives context to the fact that excellent first tier contractors have to flex their service to take account of their impact upon the operation of the day-to-day business of their customer. Business impact is an interesting point, because construction price is still a highly ranked performance measure with customers (rather than, say customer revenue protection). The ranking of cost is understandable as certainly in the current business environment, all departments have to be attuned to the need to save capital; and it is an easy measure to obtain. Measuring business impact, is somewhat harder.

The minimization of the impact upon the customer’s business of the programme of works themselves is not one which emerges in recent research to any great extent. Chan & Chan (2004) and Atkinson (1999) talk more about the positive impact of the finished product upon the customer, which is not an insignificant element, but not one noted as a differentiator of excellent contractor performance during the interviews. This omission was due to the customers interviewed for this research being informed construction-wise which was seen to give them an understanding of
the business impact of the project and programme before making the investment decision.

The ability to minimize impact on the customer’s business of the construction programme was one of the most highly discussed measures of an excellent performing contractor. This ability appears to link well to the need for the excellent performing contractor to have a good understanding of the customer’s business.

The customers interviewed also had an appreciation of the difficulties and complexity of construction and that ‘problem’ projects sometimes occur. Washington’s Property Director stated that:

"...we accept the fact that there might be some difficult jobs for contractors and some jobs are more difficult than others...”

The fact that such projects occasionally occur does not affect the opinion of customers about their contractors. What appears to be more important is how they manage and deal with such projects when they do occur. In addition, there is the issue of how they learn from them and how such learning might prevent such projects from occurring or having a negative impact when they do occur. Customers are making allowances for their first tier suppliers to deal with the ‘chaos’ of construction and those that can are the excellent performers.

Again, an ability to deal with chaos is not a KPI itself, albeit it does appear to be considered against the hard KPIs if they are being used to evaluate contractors. For example, a ‘problem’ project may cause a contractor to miss a quality, time, or cost KPI, or possibly all three during a period in the programme. The interviewed customers talked about accepting such things as part of the nature of the business rather than penalizing contractors because a KPI may have been missed. In addition, they appear to understand that such projects and the management of them are where the key learning which can be used to improve the whole programme often originates.

Crane et al (1999) notes that process measures generally struggle to take account of the context or environment within which the process takes place. Lim & Mohamed (1999) talks extensively about understanding external factors when evaluating the performance against any goal. These perspectives are clearly becoming part of the educated customer’s requirements when evaluating the excellent performers.
Customers are also starting to appreciate the ability of the excellent contractor to deal with chaos that may come from within the customer organization itself. The ability to deal with the customer's wider business flexing or even stopping the programme of works altogether is necessary for the excellent performing contractor. Customers recognize that managing chaos was a very real issue, likely because the construction programme tends to be a support element to the customers’ main business. If other business considerations dictate a change, the construction programme will have to respond. The issue has come to the fore in recent times due to economic pressures, meaning some customer organizations were being forced to shrink their construction programmes.

### 4.2.2.8 Innovation through learning demonstrated and the ability to value manage the project solution

Yeung et al’s (2008) perspective on innovation is that the cost saving resulting from innovation is the key measurable. Yeung et al’s (2008) perspective assumes that cost is the most important output to the customer. However, given that one of the key points of the herein reported research is that the main driving output of the construction programme can switch between time, quality and cost, such a perspective for innovation requires widening. Beatham et al (2004), for example examines from the EFQM model which looks for continuous improvement through innovation and learning.

Yeung et al’s (2007) position appears to be more akin to value management which was not mentioned in any great depth by the interviewees in this research. ‘Designing out waste’ can mean cost, but it could also mean time or elements of design that compromise the function or functional requirements of the finished product. This understanding reinforces the point that the excellent performing contractor needs to understand the goals and the business of their customer.

Those customers who do still carry out the bulk of measurement at an output and/or project level do appear to understand the power of learning as a performance differentiator. Customers are starting to demonstrate an understanding that output measures are fallible due to the uncertain nature of construction works. Customers acknowledge that mistakes will be made during projects and that these can be created by the customer themselves. Kagioglou et al (2001) suggests that the ability to learn from experience as an organization is a measurable part of a process/performance measurement scorecard although it must be driven in alignment to overall vision and strategy.
Innovation is viewed by the participants in this thesis research as a way that a first tier contractor can add value to the construction process that is beyond the contract or project specification. In this way, innovation can be viewed as a key differentiator which does not always have its own KPI. Some have described innovation as the ability of the first tier contractor to think on their feet when encountering issues on site. Alternatively, innovation can manifest itself as being able to give input at the design development stage which assists in designing out waste at a project level. Innovation in terms of wholesale changes in the way things are done appears to come from the materials or building technology arenas rather than the first tier contractor level; according to, for example, Washington and Miami, who are starting to employ timber frame technology as an example.

The above position on innovation extends the recent research of Beatham et al (2004) and Kagioglou et al (2001) suggesting that innovation cannot simply be measured in financial terms. Although financial assessment of innovation is still a key area, the ability of contractors to innovate ‘on their feet’ links with the previous section which notes that the ability to deal with chaos is an excellent performance indicator.

4.2.2.9 Self management and stability

Construction customers with large programmes of works are looking to be able to have the confidence that their suppliers will deliver their programme requirements without the need for intervention. Customers of today’s UK construction industry expect their first tier suppliers to be able to react to changing drivers through the life of their programme as a matter of course. Albeit that, from the case study with Oakland, it appears such an approach requires the supply chain itself to demonstrate that it is still providing the best outputs available from the market to the customer.

The stability of delivery without the need for intervention is not just a representation of excellent performance, it is a necessity should customers need to destabilize and change other parts of the capital delivery process. Such change may include their internal processes/business, the wider supply chain, or their relationships and methods of interaction with their own stakeholders. It is very difficult to continue to operate with more than one element of your business model destabilized at any one time according to Oakland’s Property Director, who commented that:

"...any organization doing what we’re doing now in Oakland have got three constituencies: your employees, your customers and your supply chain. I
couldn’t have changed the supplier structure...without having a reasonable, stable customer relationship. Because in my view you can only run with one of those destabilized...”.

The reality of business is that change is continual and that such destabilizations are necessary and may need to be managed often during the flow of a multi-year programme.

Construction customers are also starting to look beyond the perspective of the delivery of construction projects. The advent of delivery vehicles such as alliancing has brought forward the need for the first tier contractor to display management capability. Customers are buying the contractors’ ability to manage practical delivery more effectively than they can themselves. The excellent performer will therefore display excellent management and planning ability at a programme level and will be almost capable of acting as a consultant to the customer as well as a ‘builder’. This ability is an example of extra added value which customers expect from their excellent performers.

‘Contractor as consultant’ is an area that has received little, if any, attention in the construction industry research, even though self management of a programme of works might seem to be the logical extension of the current trend for alliancing. Whilst it is beyond the scope of this thesis to examine this issue in great detail, it is clearly something that more advanced customers are looking at from their first tier contractors and represents a future line of investigation for the industry.

4.2.2.10 Self driven business analysis and improvement

Customers are becoming happier to employ first tier contractors who will open up about their strengths and weaknesses honestly with the proviso that they can also demonstrate their improvement strategy and timetable. The understanding of where strengths and weaknesses lie should be demonstrated through a research process of the contractor’s own initiative in an honest attempt to examine themselves against their peer group. This perspective of excellent performance makes logical sense as any contractor who states that they are the best at everything is unlikely to be being honest with themselves. Oakland’s Property Director commented:

“If I was going to appoint a first tier contractor and they came in to see me and they could tell me, and they were happy to tell me, warts and all, how they stood against the rest of their sector, that’s what would impress me.”
In addition, it allows the customer real comfort that the business he/she is dealing with is not content with its status quo and is looking to actively improve itself. Self improvement is a demonstration of excellent performance as it is the first step in being able to improve contractor performance to their customers – commencing with knowing where they are to begin with. A demonstrable ability on the part of the first tier contractors to challenge themselves to improve their position is another key area of excellent performance. Oakland’s Property Director stated:

“...if [the contractors] weren’t at the top of the game they’d be able to explain to me why and what they were doing to get there. That’s the most important thing to me.”

Self improvement is a further expected behaviour that should be self generated by contractors without input from the customer organization. First tier contractors should be demonstrating that they are continuously adding value through their business interactions with their customers beyond simply what any KPI suite may state. Such proactivity is becoming a required state of the excellent performing first tier contractor, as noted from the above quote.

Customers, such as Oakland above, know that understanding what contractors are doing to improve their own business gives the best insight about how they operate and how they ought to be managed. Such knowledge allows the customer to assist the contractors in adding increased value to the delivery process. Excellent performing contractors will have such a demonstrable plan in place for improving their own business. Customers are becoming accustomed to working only with organizations who can actively demonstrate an ambitious desire to improve themselves.

The notion of honesty and integrity about strengths and weaknesses brings into question the traditionally accepted procurement process of the UK construction industry. The process traditionally requires contractors to jump through preset hoops to demonstrate that they are excellent at everything. Responses to procurement questions rarely come with a list of organizational improvement areas volunteered by the tenderer. Customers who understand that it is not possible for any one contractor to be excellent in every area compared to their peer group will be looking for more intelligent procurement responses from tenderers.
4.2.2.11 Self driven widening of the service offering

In many instances, the customer’s department which interacts directly with the first tier contractors may only be responsible for the delivery of capital construction projects. Many first tier contractors are extending their market offering to such areas as facilities management, waste management, and management consultancy; to name three popular examples.

A first tier contractor who shows an aptitude for understanding the wider business of their customer may develop the ability to provide services to wider departments within that customer organization. The research behind this thesis has demonstrated that such a procession of events not only demonstrates an excellently performing first tier contractor, but also shows faith in that contractor from the customer organization. In some cases, this development is actually suggested and driven by the customer. The ability to then successfully deliver this paradigm shift in service delivery becomes excellent performance in itself. Customers may view such broadening of service provision as excellent performance due to the bundling effect of services and the potential economies of scale that can generate. Washington’s Property Director indicated:

“...what we might have then in year one is building a small Washington, year two building a big Washington in steel and then year three they build a big Washington in wood. So what you do is you look to create that capability over one or two or three years...”

Some customers have excellent performance criteria at the business strategic level. Excellent contractors are viewed as those who can expand their business offering strategically in line with their customer’s business expansions. With such contractors, a multi year plan can be put in place for the first tier contractors to achieve which can involve establishing the ability to take on different types of projects. Either this or the contractor can be expected to develop the ability to deliver similar projects in a wider geographical location. Washington’s Property Director suggested a need to:

“...get used to working in that region, get used to establishing a supply base, maybe go and employ a project manager who lives in that region...”

Performance against such a strategic plan can be benchmarked and can be used as a quantitative measure of an excellent performing contractor.
The contractors selected for such development by customers tend to be selected, however, on a subjective basis which hinges upon the relationships and the ‘ability to work together’ which the customer experiences with the contractor. Washington’s Property Director stated that:

“...it’s more subjective that objective, you get close to these guys and these companies by working with them on a day to day, week to week basis.”

This assertion suggests a qualitative input driving a quantitative output for excellence, which is similar to a scenario discussed with Oakland during their case study. An enabler of such a strategic growth plan therefore is the senior management relationship and commitment to the plan which is a key driver to the process. Relationships and commitment are not a measured element, but customers do insist on having key contractor personnel in place with whom they can work.

Customers employing the strategic growth plan also state that compliance with and performance against output KPIs was used as a way to divide up future workload. This compliance however would simply allow contractors to expand their workload within their existing sphere of competence. This was seen to be an excellent example of the difference between complying with ‘output’ KPIs demonstrating good performance and being rewarded; and excellent performance against the ‘satisfaction’ elements which really impresses the customer and results in true business changing rewards.

Furthermore, compliance with measured KPIs is treated by customers as merely a signifier that a contractor is ready to become part of a more strategic group. The contractor can then be assessed and potentially progressed from a strategic performance perspective. Customers have stated that there have been contractors being managed and interacted with at the strategic level who have fallen away from a strategic group level. Such falls are often due to poor performance against their measurable items, demonstrating that the basic output deliverables of the programme are still required for a contractor to remain part of the programme at all.

These organizations which fell foul of output KPI performance have had to re-examine their business model before attempting to return to the level of strategic partner.

Customers are becoming increasingly aware that such improvements will not be delivered immediately upon appointment of contractors. Drawing benefits from
excellent performing first tier contractors requires a relationship of two to three years according to Oakland’s Property Director, He said:

"...we’d get up to optimum productivity from that supplier, optimum relationship position some time after you’ve outsourced. So I’d say it takes two to three years to get to optimum performance”.

This awareness demonstrates that customers are willing to exercise patience in the development of their first tier contractors. The short term focus on delivering time, cost or quality whilst still important is becoming a given element of contractor performance. Customers are realizing that the way to achieve the necessary outputs is spending the time to manage the excellent performance driving inputs.

4.2.2.12 Sharing learning

What has also become clear from this research is that contractors working together on large programmes of work need to exchange learning that drives excellence. Oakland’s Property Director asserted that:

"...there’s increasing evidence that [the suppliers are] talking to each other. There’s some very tangible evidence that they’re exchanging best practice, because they are standardizing...”.

If one contractor on a large programme is performing excellently and others are falling behind then this adds less value to the customer than if all are performing excellently. Therefore, excellent performers are those who learn and share learning with their peer group to advantage their mutual customer. If there is performance improvement by all contractors on a programme, they can take this improvement and spread it to other customer work streams. This way all contractors who take part in learning and sharing gain something whilst the customer also gains.

4.2.3 Role of the customer

The above excellent contractor performance aspects should not go without a mention of the role of the customer in the construction programme. The comments that came from the customers were that they have to be giving the correct messages about the above issues. Oakland’s Property Director stated: “If you’re constantly talking to the supplier about the carpet tiles, then he’ll focus on the carpet tiles” Customers understand that excellent performance will only be delivered following excellent leadership from the customer themselves. If customers do not act in such a way that
demonstrates and encourages excellent performance, they are unlikely to receive it from their supply chain.

4.2.4 **Overview of the results and analysis**

The aim of the data analysis for this section of the research was to identify and understand the common ground under which customers of the UK construction industry viewed excellent first tier contractor performance. The focus of this analysis was, therefore, the factors themselves rather than the organizations or the participants in the interviews. Such focus was seen to be in direct contrast with the later case study work where the focus was initially upon the case itself to inform the common processes.

From the interviews with the customer organizations, several interesting elements emerged in terms of what excellent performance from their first tier contractors looked like. The interviews revealed that many of the traditional performance measures, such as time, quality, cost, and health and safety were treated as required performance in the current environment rather than indicators of excellent performance.

These factors were still generally seen on KPI scorecards. KPI scorecards were commonly used to measure all aspects of output performance on programmes of construction works. Such standard KPI suites can be found on the Constructing Excellence website at www.kpizone.com. The analysis of the interviews suggested that excellent scores against these factors were now seen to be the minimum requirement to continue to work for large customers.

These KPI suites of output factors appeared to be used in today’s market as factors for contractors to ensure against the dissatisfaction of their customer. In other words, those who were not seen to perform well against their KPIs were those who tended to find themselves not working for the customer for very long. This was a view expressed explicitly by the customers interviewed. The suites were not used in order to identify organizations for immediate dismissal from their programme, but to identify problems and to ensure that rectification quickly followed.

Some customers had established their KPI suites so that measures which ensured against dissatisfaction and factors which drove satisfaction were both recorded. Again, there was seen to be a set of factors which were to be complied with as a minimum, and which were generally output factors. The excellent performance
factors were more consistent with input factors, such as high performing teams, learning, cultural issues and team integration. The customers who had these two level KPIs in place appeared to understand that improving input elements would also drive the output measures. These input elements appeared to be what set excellent performing contractors apart from their peer group.

With such a two-tiered approach, customers tended to place the statistical output (prevent dissatisfaction) measures at a project level, and the qualitative/input (create satisfaction) measures at the programme level. The programme level indicators appeared to be the ones which were dealt with at a very senior management level by all parties concerned. The fact that the input issues were dealt with at programme level suggested a further understanding that those first tier contractors who nurtured the input drivers were the excellent performers at programme level and at the output level.

KPIs which measured the regular construction programme outputs were still maintained by all customer organizations that participated in the interviews for the research herein reported. Issues such as time, quality, cost and health and safety were still measured rigorously and were still seen to be of great importance to customers of the construction industry. What was uncovered was the extension beyond these KPIs to rating first tier contractors by the more 'leading' or 'input' factors. These factors may not be measured in the statistical sense, but were seen to be a demonstration of the difference between the ordinary service delivering contractors and the excellently performing ones.

4.3 The nominated excellent performing contractors

The culmination of the customer interviews was always intended to be the nomination of the one contractor by each customer who demonstrates the above qualities more than any other. Each customer interviewed had several first tier contractors working for them and each was asked to nominate just one for case study purposes. This approach was chosen to ensure that in each case, only the premium performer was being studied from each construction programme.

The contractors nominated as excellent performers were very different in terms of their structure. This fact in itself brought richness to the research as the variety of ways of constructing an excellent performing organization could be examined. The differences in research subjects’ structure took the research slightly beyond the original premise of understanding to what extent LO processes were employed within
contractor organizations. There was also seen to be the opportunity to understand how LO processes were employed within the various different types of contracting organization and whether there was any significant advantage to any of those organizations.

One contractor nominated was an instantly recognizable name in construction contracting and one of the largest contractors operating in the UK. Another was a Special Purpose Vehicle (SPV) JV operating as a legal entity in its own right and consisting of employees of two legally separate companies who had been transferred through the TUPE regulations into the JV.

A further nominated contractor was part of an alliance of a handful of small regional contractors which had framed themselves through their collaborative interactions as a single entity delivering a national programme of works. Two were medium sized contractors acting in a regional capacity which, in both cases, simply stood out from the larger peer group of contractors that were providing the customer with their nationwide programme of works. Although as discussed in the Research Design and Approach chapter, the alliance was dissolved due to decline in workload and one of the members going into administration.

The range of delivery methods suggests initially that there is no one best model for a contractor to adopt in terms of the vehicle itself. This question of the best delivery vehicle is made particularly pertinent by two comments made during the customer interviews. One customer stated that he found it difficult to state that any of his contractors were actually ‘excellent’ and that the one he nominated was the best performer out of the group that he employed. The nominated contractor is the largest of the group and the most recognizable name nationally.

Another customer stated that in his experience, the best performing contractors are ones who concentrate on the sector in which their key customer operates. This suggested that learning created from operating within many sectors either does not happen, or does not appear to be transferred adequately through contractor organizations. Based upon this particular customer’s comments it appears that having a presence in many sectors actually decreases performance.

Both of these perspectives were surprising given the literature that had been examined on the LO. Senge et al (1990, 1994) particularly suggests that the ability to learn from varying experiences and share them across departments in the business is a key element of the LO. Sharing indicates that having a larger number of
‘touch points’ would be an advantage to learning. A failure in this way suggests a lack of Systems Thinking (Senge et al, 1990, 1994), and in turn suggests that an organization learns best when it is perceived and managed as a whole system of interdependencies rather than as individual silos. These two points made by the customers are explored as part of the Systems Thinking questions which are an integral element of the case studies.

The further question that the variety of nominated contractors raises is whether the extent of alliancing effects the LO performance. One of the factors raised in the recent research (Maqsood et al, 2007) is the ability for organizations to be able to learn from their peer group. Maqsood et al (2007) discusses ‘learning chains’ albeit as vertical chains (i.e. coordination down through the contractual chain) as opposed to horizontal chains (i.e. coordination across a peer group of contractors), but the principle is the same. Those who can successfully share knowledge between organizations will have an advantage over those who cannot.

The JV delivery route is also interesting because individuals who are part of the case study may struggle to align themselves to the JV and their original employer. This interesting alignment perspective is explored in the Shared Vision (Senge et al, 1990, 1994) element of the research.

In the following paragraphs, more detail on the case study organizations themselves is given, but at no time will information be given which would enable the contracting organization to be identified. Rather, names used are pseudonyms. Therefore, no reference to the exact metrics of the organization is given, only guidance as to the size and industry area of specialism. This information is provided to demonstrate the variety of the industry covered by this work and to support the proposition that it is sufficiently representative of the construction industry as a whole.

**4.3.1 Case study one – ‘Tennessee’**

The first case study, nominated by customer Houston, conducted was on the largest of the nominated contractors, a relative household name in terms of contracting entities. For the purposes of this research, this contractor will be referred to as ‘Tennessee’ throughout. It is a relatively large player in the construction market and operates in a variety of sectors with a turnover approaching £1,000 million per annum. The public face of the organization from their website and literature is that of a contractor who is a member of the community as well as an employer. In addition,
they appear proud of their roots and the life story of the organization is prominently displayed in the foyer of their head office and on their website.

The regional director, who was interviewed as part of this research, stated that he was often happy to participate with this type of research as he had been grateful to those who had supported him during his researching days. He had been with the organization for many years and genuinely believed that his organization was different from other contractors in the way that it put trust, the community, ethics and respect for the individual and environment before accounting considerations. The organization states the belief through its literature that in acting in such a way it will deliver a profit and grow as a business.

4.3.2 Case study two – ‘Cincinnati’

This case study organization was a JV of two legally separate contracting organization who had come together in order to bring their relative strengths to bear in providing service to a single customer, Pittsburgh. Both organizations were medium sized organizations with an engineering construction base. This setup gave the author cause to consider how best to tackle such a case study. For example, for the purposes of the JV, the effective Managing Director (MD) was the head of the JV in the customer facing role, albeit he was employed by one of the two parent companies and was answerable to the management and culture of one of the organizations.

This meant the author had to approach this case study slightly differently from the others. The opportunity to get a feel for the culture of the organization was not so readily available, being co-located within the customer's premises and alongside other contractors. The JV in question was part of an alliance of the customer and these other contractors which was designed in such a way that the alliance had a single identity. This meant that field observations were of less relevance and use than with other case study organizations.

In addition, processes and procedures adopted were those of the customer and alliance rather than specifically that of the JV. This meant that the research had to focus more upon the influence of the JV over those procedures and how they delighted their customer by improving those procedures. This approach was seen to be different from the other case studies which focussed upon the operation of internal processes employed in order to delight the customer. Furthermore, any processes internal to the JV would have come from one of the parent organizations and therefore they needed to be examined in that light.
4.3.3  Case study three – ‘Indianapolis’

Case study three was a small contractor and perhaps the most focussed of the organizations nominated for research, nominated by Miami. It possessed the narrowest customer base of all the organizations in this work. It felt, however, that this was a strength in terms of quality of customer service as Indianapolis might have been at risk in terms of potential exposure to market fluctuations. This organization concentrates almost exclusively on the retail sector, which is clearly another risk to their business due to the potential of a single sector entering recession. Indeed, casual discussion with the MD of the organization confirmed that they had been probably the hardest hit by the prevailing economic conditions of all the organizations studied.

The impression received from this organization during the study was very much one of a ‘family’. Indeed, this word comes up frequently in the transcriptions of the interviews and case studies. All people spoken to during the studies, or informally, spoke of the need to ensure that people working for the organization were right for the organization culturally as well as professionally. The MD had clearly agonized over the need to make redundancies during the prevailing recession and discussed informally his personal pain at having to impact so negatively upon the lives of people he had come to know personally. The only positive thing for Indianapolis from the prevailing recession was that they had been able to better focus their remaining workforce towards the culture they felt was right for the business.

What really struck the author was the fact that redundancies had been made and the remaining workforces had taken a double digit percentage pay cut, but that the only person to mention the pay cut was the MD. Even in casual discussion, there was no hint of bitterness or resentment towards the organization or the customers who had reduced their workload. If anything, the individuals researched within this case study came across as being prouder to work for their organization than any of the others. This sense of pride and belonging appears to have a good deal to do with this organization’s propensity to deliver excellent performance to their customer base.

It is beyond the scope of this research, but it would have been interesting to understand whether the collective adversity faced had driven them to band together more strongly, or whether such a culture was prevalent as a matter of course. As this research represents a ‘slice in time’ view of these organizations, the author will not have the opportunity to discover this specifically. There appears, however, to be an area for future research embedded in this contemplation.
4.3.4 Case study four – ‘Dallas’

Dallas is similar in makeup to Indianapolis in terms of the size of organization, focus and markets served, and was nominated by customer organization Washington. Its customer base is relatively narrow, but not as narrow as that of Indianapolis. This means that they have not suffered as badly during the recession as Indianapolis. They are, however, historically relatively regionalized in their customer base, although as emerges in the case study this reality is evolving.

It became clear that the MD was very proud of the organization and very willing to discuss the organization at length. His interview was easily the longest of all conducted in the case studies. In addition, there was a clear level of passion in the way he discussed the organization. This organization also demonstrated a strong commitment to the customer who had nominated them, despite the inevitable recessionary drop in workload coming from that customer. It had in fact been the most supportive (in their opinion) of the customer in terms of looking for ways that they could weather the storm together. Their MD suggested that others in the customer’s supply chain had taken more of a ‘sob story’ approach and complained that the reduction in workload would cripple their business. The MD felt that this was already standing Dallas in good stead for the anticipated upturn in work.

It will be interesting to observe from afar as the recession ends and growth returns as to whether this organization continues to grow at a quicker and more sustainable pace than its peer group.

4.3.5 Case study five – ‘Chicago’

Chicago is the only ‘sole supplier’ involved in the case study research, because they were the only main contractor working on the customer’s programme of work, that customer being Minnesota. Their performance was deemed to be so good by their customer that they have never needed to bring in competition. The customer has instead adopted a model of ensuring that Chicago’s performance is benchmarked against industry norms using the input of a third party consultant.

In addition, Chicago is probably the most ‘specialist’ of all the contractors interviewed in that it operates mostly within one sector of the industry. It is a relatively small organization with a turnover of just under £100million which operates almost exclusively in the UK. As is noted later in this thesis, Chicago operates perhaps the riskiest model in terms of business operation due to their alignment with a relatively
small number of key customers. One customer, Minnesota, represents almost 40% of its total turnover, which is an obvious business risk should that customer cease to trade with Chicago. Minnesota is a private organization in the technology field and not, say, a government body; for which a contractor might be comfortable having a 40% exposure due to relative customer stability.

In terms of expansion of the service offering, Chicago is working internationally employing an affiliate network rather than operating under its own identity. In addition, it is moving further into Facilities Management (FM), something which it is using to innovate its construction offering to the wider market, as discussed later herein.

4.3.6 Case study six – ‘Kansas’

Kansas is by far the smallest of the contractors studied for this thesis, employing only around 100 direct employees. It is also relatively unique to this research in that it is the only one of the contractors which acts as a materials supplier to the same extent that it is a contractor. In addition, Kansas is almost as specialist in its field as Chicago is in its field, meaning it too is in a more business risky position than some of the other organizations in this research. Kansas does have the most enviable geographic location, with its offices being in the same city as the head office of nominating customer Oakland. It was not explored in this thesis whether Kansas felt that this position gave it any advantage over its peer group.
4.3.7 Summary of the six contractors

The below provides an overview of the different nominated contractors in metric terms, where known.

Table 4.3.7 – Summary of the six contractors

<table>
<thead>
<tr>
<th>Name</th>
<th>Nominating customer</th>
<th>Construction industry sector nominated in</th>
<th>Turnover (if known)</th>
<th>Direct Employees (if known)</th>
<th>Offices (if known)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tennessee</td>
<td>Houston</td>
<td>Communication</td>
<td>£800 million</td>
<td>2,300</td>
<td>25</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>Pittsburgh</td>
<td>Civil engineering</td>
<td>Unknown (Joint Venture)</td>
<td>Unknown (Joint Venture)</td>
<td>Unknown (Joint Venture)</td>
</tr>
<tr>
<td>Indianapolis</td>
<td>Miami</td>
<td>Retail</td>
<td>£200 million</td>
<td>200</td>
<td>2</td>
</tr>
<tr>
<td>Dallas</td>
<td>Washington</td>
<td>Retail</td>
<td>£280 million</td>
<td>1,500</td>
<td>13</td>
</tr>
<tr>
<td>Chicago</td>
<td>Minnesota</td>
<td>Information Technology</td>
<td>£90 million</td>
<td>Unknown</td>
<td>2</td>
</tr>
<tr>
<td>Kansas</td>
<td>Oakland</td>
<td>Financial</td>
<td>Unknown</td>
<td>80</td>
<td>1</td>
</tr>
</tbody>
</table>
5  Data Analysis and Discussion – The ‘Mental Models’ Element of the Contractor LO

5.1  Introduction

This chapter, and the four following, represent the outcomes of the construction phase of the interpretive process suggested by Denzin (1989) and Sheehan (2000) and here applied to the Mental Models discipline of the LO model. The responses from the contractor case studies were analysed with respect to their changing the Mental Models within their organizations. Senge et al (1990, 1994) proposes changing existing Mental Models which may be based upon outdated processes or hierarchies as being essential to the LO. In order to assess the presence of changing Mental Models, the research herein reported looked for the contracting organizations to be able to engage in culture change, working practices (through experimentation and innovation), and to be prepared to adapt and change the way they deal with the business environment through scenario planning.

The participants themselves were not asked to create their own definition of Mental Models or its constituent elements. The experiences analyzed within this chapter have been developed from the case studies and ordered into the headings highlighted above based upon the model proposed by Senge et al (1990, 1994). The author had brought his own interpretation of how the various sub-disciplines go into constructing the five disciplines suggested by Senge et al (1990, 1994) in assembling the overall model from the participant responses. This was not viewed as a limitation in the research, because this level of interpretation had been a feature of previous LO research (Ortenblad, 2007).

5.2  Culture Change

Before discussing culture change, it was necessary to provide an understanding of organizational culture. For the purposes of this thesis, a useful definition of culture can be taken from Lakomski (2001). He defined organizational culture as the instrument used by management to shape and control the beliefs, understandings, and behaviours of individuals, and thus the organization, to reach specified goals. It can therefore be reasonably extended that culture change within the organization will be the alteration of these existing beliefs, understandings and behaviours. This alteration may be necessary either to improve the ability of the organization to achieve existing goals, or to move towards new goals.
Senge et al (1994: 267) provided the following definition of culture in respect of Mental Models: “An organization’s culture can be seen as its members’ collective Mental Models…”

He went on to assert that in order to create change within the LO, the organization must be able to address and change its culture through changing these collective Mental Models. Therefore, the case studies in this thesis have been examined for evidence of the willingness and ability to address culture change.

5.2.1 Tennessee

Tennessee stated that it had changed the way that the central core of the organization shared information. This was done specifically to lead a culture change of knowledge sharing and to alter the mindset of the organization. The MD stated:

"We picked this up quite a few years ago now as an issue. With the sort of headline behind it "Nobody bloody tells me anything in this company."

The mindset change was an expansion of individuals’ views of working for a local office to viewing themselves as working for something greater. Jackson (2000) noted that systemic problems can emerge from a lack of understanding of the ‘whole’ by the individual. Senge et al (1990, 1994) discussed the ‘tragedy of the commons’ scenario being a symptom of this condition.

Culture change was viewed by Tennessee as a long term (five year) plan and was targeted at removing the ‘the way things are done around here’ attitude. Individuals were encouraged to challenge why things were done at all which established the value of actions to the business.

In addition, Tennessee had changed the mindset in the organization from viewing itself as a builder working for professional consultants to being a provider of professional service itself. Tennessee’s MD suggested it operated every bit as professionally as the customer’s consultants, saying:

"...the professionalism within our own company was on a much higher standard than some of the professionalism that we encountered…"

Tennessee therefore felt every bit justified in this mental model, particularly as it suggested this mindset as an industry wide shift in the UK.
Tennessee’s position fits with Cors (2003) who suggests that managers need to challenge employees to think constantly and creatively about the needs of the organization to give employees the stewardship to challenge the organizational ‘steady state’. Tennessee was approaching the end of its journey and reported to have passed the resistance to change phase and have entered the acceptance phase of cultural change.

5.2.2 Indianapolis

Indianapolis, on the other hand, was still attempting to create culture change within their organization. It was trying to move from a model where the titular leaders were encouraging ideas from their teams to a point where ideas start to flow as part of the normal course of things. Until now, management had incentivized the flow of ideas and this was something it did not want to have to do in the future. To do so, it was trying to become more relaxed and informal about the way managers interact with non management personnel.

Indianapolis was trying to initiate ideas from the point of view of encouraging the person who lays the bricks to feed back expert knowledge. Thus, Indianapolis was trying to move away from the more traditional hierarchical view that the experts were the designers and those doing installation were “...lower than low...” who need to be controlled. The aim of this approach was to even out the perception of each role’s level of importance to the overall project. Ortenblad (2002) noted that creating the culture within the organization to generate learning was much more of a challenge than the traditional model of controlling individuals.

Indianapolis, in line with Ortenblad’s (2002) position, was struggling with such culture changed because of the way their professionals were educated. Its position was that the current system which supplied new graduates into the industry teaches them to position themselves in terms of what their profession was and to draw clear boundaries. Indianapolis believed that this leads to an initial uncooperative approach from team members when they first join the organization. Indianapolis was trying to change this existing culture for one of more collaboration. In particular, it was looking for different design areas, such as Architecture and Engineering, to collaborate on developing innovative design solutions, suggesting a ‘collective’ approach to learning (Ortenblad, 2001) similar to a symphony orchestra of different instruments learning to play together.
Indianapolis had more success in changing the culture of the relationship with their customers. What it had done was to move its relationship from being a contract and letters relationship, to being truly one where Indianapolis and customers sat alongside each other. This change had been helped by having an educated customer in the form of their nominating customer, Miami, who had encouraged and welcomed this approach. The Miami team suggested:

"We do things with Miami's that we wouldn't do with other people..."

Indianapolis suggested that this encouragement had been a big part of improving the trust and communication over time between themselves and their customers which had led to more successful projects. This approach was in line with Flood (1998) who suggests that discourse was the best vehicle for culture change.

In addition, Indianapolis had had success in changing the cultural acceptance that construction sites were dirty. It has strived to provide clean, tidy and efficient sites for all the trades working at those sites. The tidy approach had extended to trying to ensure that those sweeping the floors on site were instilled with a sense of pride about the level of cleanliness of the site. Such order was likely to lead to a more efficiently working site. Indianapolis’ MD stated:

"...why should a building site be a dump? You know, why should people work in mud, in dirty, unlit sites with bad canteens and no proper drying space? You know you have drying space but why shouldn’t it be factory conditions?" "...the plasterer is plastering the wall and if he's in the dark and walking in mud because he’s got mud in the room, how on earth is he going to get the plastering great?"

There have been some struggles in terms of extending this culture to more senior recent hires and subcontractors, but the recession had actually allowed Indianapolis to trim back its workforce and supply chain to a core of people and organizations who have embraced their culture changes.

### 5.2.3 Chicago

Chicago was working to change the blame culture within the industry through their interactions with the customer. The Minnesota delivery team was starting to understand that customers were becoming weary of their construction team
members, such as consultants, contractors, and suppliers, not taking responsibility when things go awry on projects:

"...you know everyone is pointing fingers at everyone else, no one takes responsibility..."

Chicago had started to take it upon itself to understand its customers, particularly Minnesota, better than anyone else in the supply chain and thereby take the responsibility lead. This had led to them taking responsibility for making sure everything was as they knew the customer liked it.

Chicago’s position was similar to the learning supply chain as set out in Maqsood et al (2007) where the entire chain attempts to be better than its peer group as opposed to organizations in the same chain competing against each other. Chicago’s approach impressed Minnesota as a customer and Chicago suggested that other customers were beginning to approach their projects in the same way as Minnesota. Reichstein et al (2008) postulated that much learning and innovation in the construction industry flows from interaction with 'intelligent' customers.

5.3 Experimentation

Experimentation can be defined as the 'learning by doing' element of challenging existing Mental Models. Such areas as using a new team structure, employing a new process, and adopting a new belief in service delivery would fall under this definition (Bessant, 2005). Chinowksy (2007) defined experimentation as an essential element of the LO; it was discussed by Senge et al (1990, 1994) as being one of the ways in which the existing Mental Models of an organization can be challenged. Areas of, and approaches to, experimentation, and in the following section innovation, have been identified within the case studies as examples of LO thinking.

5.3.1 Cincinnati

Cincinnati encouraged experimentation with a "...let’s have a go and see if it works...” attitude towards ideas. Generally, they were ideas imported from other sectors within the business, so it was not taking the risk that such an approach might suggest. It suggests that one of the key issues here was that those carrying out experimentation were supported by the business which provided them with a safety net should things not work out.
Maqsood et al (2007) asserts that experimentation was one of the five supporting elements to learning and innovation. Cincinnati noted that experimentation did, however, have to have the support of the customer which unfortunately was not always forthcoming. This issue was not dealt with in the aforementioned research. Chinowsky et al’s (2007a) and Maqsood et al’s, (2007) assumption in this area appears to be that of an organization free to experiment on its own terms.

Furthermore, Cincinnati was prepared to flex its rules in order to ensure that it helps the customer to best effect. The focus group agreed that small areas such as constricting design and pricing programmes were relatively minor:

“...if I was to stick by the rules, that what I should [say is] ‘No, that's three months.’ But we've always tried to sort of help...”

But demonstrate an empowerment at the delivery level to depart from the rigid standards in order to deliver excellent performance. At this level it was stated that although such services were provided, the customer was not always willing to reimburse the extra cost incurred whilst providing the extra service.

This was still an area of concern for Cincinnati, albeit its relationship with its customer Pittsburgh was good enough that it withstands these relatively minor issues. It was noted that this type of approach was not taken with customers where the relationship was not strong enough, or that the customer culture was not supportive enough of the potential mistakes which may occur when flexing an understood process.

Delivery level experimentation within Cincinnati extended to the installation of new technology, but this had tended to be at the behest of the customer according to the focus group:

“...[customer] came down yesterday and said 'I've got this new technology I'd like you to trial...we'll have a look at that and see what we can do, put it on one of the jobs...”

This experimentation was made possible by the quality of Cincinnati’s people to gain an understanding of new technology and how it could be made a successful part of a project. It was useful to again note the departure from the assumptions of previous writers (Chinowsky et al, 2007; Maqsood et al, 2007) that experimentation was free from the need for support external to the business.
5.3.2 Indianapolis

Indianapolis’ employees have the freedom to experiment with their service to their customers particularly as Miami expects it. Miami runs a Centre of Excellence for its contractors where such experimentation was meant to be brought to the table. The Centre of Excellence is a knowledge exchange forum where best practice processes and technology can be (and is expected to be) exchanged between Miami key suppliers, for the benefit of all participants. This did not reveal whether Indianapolis had become excellent at experimentation due to becoming a LO or whether their customer had led them to the point they were at now. Although the Miami director did view its contribution at this forum as unique to this forum:

“…we have a centre of excellence for Miami and my agenda’s totally different to everyone else’s…”

It did suggest that Indianapolis was adept at working in communities of practice (Maqsood et al, 2007) which supports peer to peer knowledge exchange.

Experimentation from Indianapolis’s perspective was moulded through understanding Miami’s time-cost-quality triangle (El-Rayes & Kandil, 2005). It understands that with time being the key driver within Miami, it was likely that changing something that actually increased capital cost but reduced the time taken to execute the project, or part of the project, will be accepted. An example of this from the Miami director was the modular build units: “...we know Miami’s been very keen on components of modular build...” which Indianapolis had started to install which get delivered on the day they were meant to be installed, adopting a ‘just in time’ principle (Akintoye, 1995).

Indianapolis’ innovation position was tempered through one individual in the focus group mentioning that their customer, Miami, was willing to let them “...experiment, as long as it works...” which was an interesting comment suggesting that Indianapolis did not have carte blanche freedom to experiment and make mistakes. Holt et al (2000) made it clear that in order to be a true LO mistakes must be treated as learning opportunities.

It was, however, suggested that Indianapolis’s own MD was generally displeased if the products they produce were the same each time. It was stated that his attitude was: "...don't stand still, continue to evolve, continue to change." This statement appeared to indicate that when experimentation occurs there was potential to not get
it right every time. Senge et al (1990, 1994) continually tied the need to become a LO with the need to change and adapt to the changing environment. In addition, he postulated that those that can create the change were those who were working within the organization and were empowered to do so. This insight suggests a duality of drivers within the construction LO.

Indianapolis did acknowledge the risk associated with experimentation in the construction arena. Doree & Holmen (2004) and Sidwell & Budiawan (2001) set out the difficulties and risks of innovation and experimentation under a traditional contract-led customer-contractor construction relationship. Under a traditional contract, the contractor might be expected to carry disproportionate risk which would discourage experimentation. Indianapolis did, however, tend to try and work with its customers, particularly Miami, to ensure that a proportion of the risk and reward for experimentation was understood and placed with Miami:

"We do things with Miami that we wouldn’t do with other people. Because they appreciate that we’re taking a risk on certain things..."

In order to do this, Indianapolis had made itself adept at carrying out risk to reward analyses for the benefit of their customers. This approach had only been possible due to working for such an educated customer as Miami.

The more risky experiments that were not successful were described by Indianapolis as: "...failing innovatively...". This comment suggests that it was drawing learning from failures and thereby making the term failure a bit of a misnomer in these cases, similar to the situations set out in Ajayi & Smart (2008) and Kreigsmann (2005). Indianapolis was also safe in trusting that Miami will not use a contract to attack them for such failures when both parties understand that experimentation was taking place.

5.3.3 Chicago

Chicago was trying to encourage experimentation within their service, particularly with respect to quicker project delivery. Faster delivery had been relatively successful, but had largely been driven through customer necessity. Furthermore, it had improved its site setup through experimenting with the layout of the hoardings. This had been driven from Chicago’s desire to improve its image in the eyes of the customer and public, something which the industry had struggled with for many years and with which it was still struggling (Galloway, 2009).
5.3.4 Dallas

Dallas’ MD encouraged its project managers to experiment through senior management asking the “Why are you doing it that way?” questions to challenge the assumptions behind decisions (Cors 2003; Senge et al, 1990, 1994). In addition, Dallas’ ‘Align’ team was designed specifically to look for solutions to customer problems before their projects reach site. When working for Washington, the delivery of the product was treated as an absolute, but how it was delivered and how problems and opportunities were treated was a matter for Dallas’ project managers. These project managers were then encouraged by senior management to reflect upon what went well and what did not which aids learning from the experimentation carried out (Senge et al 1990, 1994).

5.4 Innovation

The definition of innovation for the purposes of this thesis was distinct from that of experimentation, in that it can be defined as a more deliberate developmental process. Bessant (2005) noted organizational innovation requiring the following four phases: Searching (or scanning the environment), Selecting (the decision process), Implementing (translating into something new) and Learning (from the previous three steps). The output of the innovation process must be purposeful, as stressed in Na Lim et al (2010: 569), who defined innovation as: “the purposeful search for new knowledge and the systematic application of this knowledge in production”. Pellicer et al (2010: 104), however also defined innovation by its “…success once introduced to the market” which emphasises the need for innovation to have a business-enhancing outcome in the construction industry and not just a business-enhancing purpose.

The above distinction is necessary as in order that innovation provide excellent performance to the customer, the result must be success from the perspective of the customer. Therefore innovation which is not successful in the market place cannot be termed as successful LO processes within the context of this thesis.

5.4.1 Tennessee

Tennessee’s MD prided himself in taking its lead from the more innovative industry bodies, such as ‘Movement for Innovation’. It had followed the model of this body in order to drive excellence within the organization:

“So lo and behold, T4E which is Tennessee for Excellence”. 
The model had prizes for innovation, but it suggested that the approach really changed the culture to help them become a more innovative organization. Tennessee’s approach, however, was tempered by the realization that there was not always the need to ‘push the boundaries’ when providing service in the construction industry. Oftentimes, the tried and tested approach was what was required and innovation, when driven, was done so in a focussed and needs driven basis (Ivory, 2005).

Tennessee also noted that its move into more innovative states had followed the lead from their customer base. This was particularly the case for customers who have acquired senior personnel with experience from outside the construction industry and brought them in to manage their construction programmes according to the MD:

"...the ideas that he had coming from the car industry he brought into the [customer names] scenario."

These personnel appear to bring the drive and ideas from their previous careers and attempt to drive the same thinking within the construction programmes. This outcome suggests that organizations such as Tennessee appear not to have an ‘innovation epiphany’ but were brought to innovation gradually through interactions with the most advanced customers.

5.4.2 Cincinnati

Cincinnati’s approach to innovation was wider and more proactive than that of Tennessee. Being a JV organization, it carried out regular ‘trawls’ of the parent organizations through its leader, who commented: "Basically, cast your net out, trawl in, have a look at it..." to establish what had been developed during customer service and then bring such innovation in centrally. In addition, Cincinnati had listened to the ideas of graduates coming into the organization and thus improved their induction processes. The graduate process had given visibility to the fact that innovative ideas were heeded within the organization no matter where they came from which appeared to have encouraged the flow of ideas. Interestingly, few of the writers on innovation in the construction industry note recruitment as a source of innovation. Gray & Davies (2007) noted the necessity of human resources to recruit skills to support innovation, but not that individuals can be tapped directly for innovative ideas.
What Cincinnati was trying to get away from was the scenario where highly experienced people can inadvertently kill off innovation by pointing out things that have not worked in the past. What it was trying to foster was the attitude that something may not have worked last time, but how can it be made different so that it did work this time. This was something Cincinnati’s leader acknowledged he had to get better at encouraging.

“...people suggest things and they say "It won't work." And it seems negative.”

At least Cincinnati’s director had acknowledged a problem to be addressed and designed out, which demonstrated progress towards Senge et al’s (1990, 1994) ‘leader as designer’ scenario.

5.4.3 Indianapolis

Indianapolis had implemented a consolidation centre where materials go to be stored and recycled which helps to reduce space requirements and waste on site. In addition it had pioneered the use of 3D modelling, which Indianapolis considered had given it an edge over the competition in terms of being able to demonstrate what the finished product will look like to all stakeholders, its MD noted:

"I can see that we will be at a point where we will be 3D phasing, 3D building the jobs, 3D pricing the jobs"

Other innovations introduced include the pioneering use of site accommodation and storage space to reduce the overall space they occupy on the customer’s site whilst carrying out works. Indianapolis appears to be the only contractor in this research to be implementing innovation without the need for customer prompting, as suggested by Gray & Davies (2007).

Indianapolis’s success with practically implementing innovation, however, had been curtailed by the recession. The mental focus had moved away from ‘changing the game’ for their customers to securing turnover. It was still very open to new ideas in all elements of the business. Indianapolis suggested that if someone came up with a more efficient way of sweeping floors the directors would listen and try to implement such innovation. Indianapolis MD prided himself in Indianapolis’ mental model of being a service provider:

“building is just 50% of what we do. That's our day job but it's the other bits that make us different”
This assertion would suggest that Indianapolis had developed, more than some of the other contractors in this research, a service provision and customer orientated approach as called for by Reichstein et al (2008).

An example of innovation was the ‘Retail Diary’ which was used by Indianapolis to monitor the disruption levels they caused to Miami whilst they were on site. It then turned this information into better informed decisions on the phasing of works on subsequent projects in order to minimize that disruption. Miami had introduced a KPI in this area since this innovation had been implemented and Indianapolis had rolled the tool out across other customers with some success. This tool had allowed customers to make an informed decision weighing capital cost, time to completion and level/intensity of operational disruption in the overall investment decision process. The focus group noted:

...we're actually conducting a 36 week job at the moment. We went back in I think with a short programme of I think 21 weeks, I think we went in with, which we could do. Disruption figures on the 36 weeks was 5-6%, disruption on the 21 weeks was 35%. So... and they seriously thought about doing it in that smaller period...

Innovation was a two-way issue to Indianapolis and they understood that the only reason that they can innovate at all was that they have customers that were receptive to innovation (Gray & Davies, 2007). Indianapolis’ MD knew that Miami was prepared to listen and usually implement customer advantageous ideas:

"...if we believe that there is no flexibility within our client we wouldn’t even entertain [innovation]."

Some of Indianapolis’s innovation was rolled out across the rest of Miami’s supply chain which suggested that it was highly valued by their customer.

5.4.4 Chicago

Chicago’s greatest innovation had been the creation of ‘warranty support management’. This was a FM support service which had taken on the role of providing warranty during Chicago’s construction projects’ defects liability period. Contractors were usually liable under contract to correct any discovered defects in the projects for 12 months after the project was completed. Chicago had found, as many other contractors had, that project teams were not efficient at returning to
sites to correct defects. As such, it had changed the mental model of 'defects' to one of an 'after sales service supply chain' as you might get when purchasing a product such as a new car (Saccani et al, 2007). Chicago’s MD was clear about the drivers for this change:

...what we've done is every construction project now, at the end - once it achieves practical completion it is handed to our FM Company to look after the warranty - our warranty obligations through the defects liability period. Now that's been a very interesting transition for us.

...we did it because project managers are useless at coming back after the end of a project and doing something about something that's gone wrong. And you can actually wind up losing a client because you know, because he's gone and screwed the wrong coat hook on the back of the chairman's door or whatever it might be. Having successfully delivered a £10 million job you then screw it up in the last two months because you don't attend to something.

Chicago’s mental model of the defects liability period appeared to be unique in the industry and no similar examples could be identified in recent research.

Despite this breakthrough, Chicago confessed to not having a formal innovation strategy. The MD suggested that he was always 'tinkering' and was trying to encourage a culture of tinkering within the organization by constantly asking people why they were doing things a certain way and whether there might be a better way of doing those things. He did this because he suggested that Chicago as an entity was better at design innovation than process innovation, which was where Chicago was now focussing. Simply changing the mental model to be similar to the ‘Lean’ implementation environment of manufacturing (Mao & Zhang, 2008; Sacks & Goldin, 2007) was still an innovation step away, as the MD noted:

"...I go onto a site and I see the electrician on that site with all his materials at one end of the site, and him working down the other end, probably on the mobile phone most of the time. And he's kind of wandering over to his little store and picking up a new something and wandering back to where he's working and screwing it on, and I just think, this is ridiculous if you were in a factory and someone was doing that you'd do your nut. But because it's a construction site it sort of seems to be okay."
Those in the focus group were less committal about innovation within Chicago who simply felt that good ideas should be channelled through line management. However, throughout the discussion, the focus group appeared to be searching for an answer which was not easily to hand covering technology, design, process, and planning. This seeming uncertainty supported the theory that experimentation was stifled by tight timescales (Ivory, 2005). Chicago’s focus group noted that tight timescales were a major factor under the Minnesota contract:

“...timescales were getting shorter and shorter and we did the project in a ridiculous amount of time – something like a sixteen week project taking ten weeks...”

Given the opportunities suggested in the quote in the previous paragraph, there was certainly still scope to further innovate and change some Mental Models in Chicago.

5.4.5 Dallas

Dallas’ MD accepted that the construction industry was not well viewed in terms of its ability to deliver to customer requirements:

“...all the government’s KPIs would suggest that half the clients aren’t happy with the end product.”

For this reason, Dallas had attempted to set itself apart from this perceived culture through the use of its ‘align-plan-deliver’ system. The system ensured that Dallas could take a design which had been diluted from the customer’s original vision after being influenced by the consulting team and realign it with that customer’s vision, planning and delivering the project to that vision. The align stage, suggested as the most important, was the stage where conflict was dealt with to try to ensure that the rest of the project proceeded more smoothly.

Through the ‘align-plan-deliver’ system, Dallas had changed the mental model from that of being subservient contractor at the end of the design chain to being one of construction expert. Dallas’ scenario was therefore very similar to the case study in Holt et al (2000), which noted creativity as a key element in being able to problem solve. Creativity was a common theme running through the Dallas case study as it was suggested that their unique selling position in the market was their culture of creativity:
"...[Dallas’ director] would rather lose some money and have people making change and being innovative and trying new things and being responsible for their element of a project rather than take away all that."

This quote suggests that Dallas had worked hard at changing its culture to one of creativity. This contrasts against Dallas’ view of an industry backdrop of "...average performance, average process and average returns...".

The ‘Align’ team had to keep up to date with new materials and technologies that they might be required to plan and deliver on projects. This department and its activities were being supported by one of the directors who understood that Dallas had to become more innovative over time in order to keep competing:

"...they will have a budget for new ideas. So usually £2,500. So if they say 'I've found something out and I need to go to a convention in Paris.' They don't have to ask me. I trust you to develop something that will actually pay that back, over time."

5.4.6 Kansas

One innovation that it was currently being examined by Kansas was a potential merger with a consultancy organization to broaden its service offering. In addition, due to the fact that Kansas had its own joinery manufacturing arm, it looked for manufacturing innovations, albeit with consideration to the business impact of such innovation. Kansas noted that its work with Oakland had been particularly useful for finding innovation, ironically due to its repetitive nature (Manley, 2006). Kansas suggested that it can trial small innovations on one project which can then potentially be rolled into future projects.

5.5 Scenario Planning

Scenario Planning can be described as the process of constructing alternate futures of a business’ external environment, with the goal of learning to use these alternative futures to test the resiliency of the current organizational action plan with respect to the organizational culture (Mason, 2003). Senge et al (1990, 1994) suggested that the planning for upcoming scenarios was essential to change the Mental Models of the organization’s responses to future problems and opportunities. This was part of the generative learning as opposed to reactive learning process. This area had received scant attention in the recent construction arena LO research, but given its
prominence in the work of Senge et al (1990, 1994) it was essential to understand this area from the perspective of the participants.

5.5.1 Cincinnati

For Cincinnati’s parent companies, scenario planning had come to the fore due to the impact of the 2008-2009 recession. The organization had planned for a range of impacts from best to worst and how to best prepare for the recession. This might be observed as ‘survival learning’ (Senge et al 1990, 1994) due to the fact that it was not undertaken until the recession was upon Cincinnati. Survival learning was necessary for any organization, but the LO must complement it with generative learning (Senge et al 1990:14).

Cincinnati’s parent companies’ scenario planning had centred on the identification of a small number of key individuals who created the most value for key customers. These individuals had succession plans drawn up for them which involved incumbent leaders being tasked with establishing what their successors needed in order to be able to most easily step into their role (or another role if the individual so chose), Cincinnati’s team leader noted:

“If I’m going to move in a year’s time, the succession planning across the patch, from a leader’s point of view, is essential.”

This approach, however, did not fit into the definition of LO scenario planning as defined in the first chapter of this section as there was no establishment of alternative futures.

Cincinnati’s parent companies did, however, ensure that customers were part of the succession scenario planning. Customers were educated to understand that people needed to evolve and move on in their careers. They, therefore, were already bought into the process and the person by the time any switch was actually made. This approach suggested a proactive engagement of the customer in their internal processes, which appeared to be becoming popular in industry (Wolfe et al, 2009).

From a workload perspective, Cincinnati operated in a regulated industry with relatively predictable upswings and downturns in work and therefore scenario planning was part of good management. Cincinnati was still caught off guard, however, by projects arriving during a period where they should be in a downturn.
The succession and workload approaches within Cincinnati suggested two issues worthy of consideration. Firstly that Cincinnati was not so much scenario planning as only planning for what was most likely to happen in the future. Secondly that there was not enough engagement with, or from, the customer to enable good workload planning. If, however, Cincinnati knew this to be the case, good scenario planning would have it using an off-the-shelf response to these ‘unexpected’ increases in workload. In fact, one of the participants at the focus group stated:

"...whatever they throw at us we’ll sort it out. That’s what we do".

This was an admirable approach in itself, but suggested a highly reactionary approach to changes rather than a scenario planned one where various ‘end states’ might be anticipated (Mason, 1994).

5.5.2 Indianapolis

Indianapolis, similarly, did not seem to be advanced in the area of scenario planning. The responses in this area were very much along the lines of "...we’d cope..." from all participants. This was particularly evident when the question of a sharp upturn or downturn of work was discussed, for which there was no off the shelf plan available. Indianapolis did try to plan for the recession, but not for the extent of the impact it had. The situation had become more serious than originally thought due to its reliance upon the retail sector and Miami who were hit hard by the recession.

Indianapolis’ position unfortunately suggested that management ability to break free from the ‘rules’ of the business (Mason, 1994) when planning was not prevalent in Indianapolis. It actually appeared that Indianapolis was stronger at scenario planning years ago than it was today. There was conscious effort to diversify their customer base beyond just Miami to enable Indianapolis to continue to grow if Miami work ever stopped coming. The focus group stated:

"...we need to be, rather than a whole hand that is Miami, we need to be fingers that are clients."

It was this scenario planning that brought Indianapolis its current customer base.

5.5.3 Tennessee

Tennessee’s main scenario planning focus was around planning for the future based upon a range of best to worst case market scenarios on a three year rolling basis.
This scenario planning focused upon what the organization needed to look like in order to be able to best exploit the market and what mix of skills was required to do so. These scenarios were researched through live market research to keep the likely future scenarios as realistic as possible. Tennessee’s MD stated that the planning 

“…paints a picture of best case and worst case and most likely case of what the organization needs to look like in terms of size and skillset…”

This assertion was the closest of all the contractors in this research to a model of scenario planning suggested by Chermack et al (2006), Mason (1994), and Senge et al (1990, 1994).

For example, senior members of Tennessee’s government team speak regularly with those who place public sector work to the market to understand the potential upcoming workloads. This information forms the basis of the scenario planning for that team and with other teams doing similar; it was possible to have the basis of a rolling plan for the entire organization.

5.5.4  Chicago

Chicago’s scenario planning was focused in the disaster recovery arena. They have a pandemic scenario plan for example. Chicago was, however, more suspect in the scenario and workload planning and business arenas. It did not, for example, have a plan in place for the scenario of a key director suddenly leaving or becoming incapacitated. Nor did it have one for the potential scenario of their biggest customer suddenly not being able to provide them with any work. The attempt to plan for this position had not been carried out; rather the MD stated that attempts had been made to mitigate the risk:

“…a particular company had to increase their spend with us to the point where they accounted for 40% of our turnover. And we knew that that was an incredibly risky position to get into. But what the hell do you do about it? You can't say to them, "Don't give us orders." Because then someone else is going to get in and next thing is you'll have nothing...”

Chicago was currently consolidating its position within the market through actively looking for further customers of a reasonable size. In addition, it was trying to strengthen contractual and relationship positions with existing customers. This proactivity demonstrated a level of mitigation of a scenario, but not a plan for its
occurrence; an approach that was again more along the lines of survival learning (Senge et al, 1990, 1994).

5.5.5 Dallas

Dallas had recently started carrying out some ‘what if’ planning with their upcoming workload in terms of potential impacts on staffing and skill requirements. Its MD stated:

"...if a number of these jobs do come off how would we resource it, would that mean you know taking on board more people from within the Group?"

In addition, there were some scenario plans in place for the wider business. Dallas did however note that no formal scenario planning was done and that all such things were done as part of informal discussions or meetings. These scenario plans covered such things as senior directors leaving the business. Such exits were covered by a limited amount of job shadowing so that one directors role could be shared amongst the others in case of emergency.

Dallas had the perspective that you cannot run a business where one person was indispensable and the business fails if they cannot be replaced. This was shown in its succession planning, where for example Dallas knew that one of their directors was retiring in less than two years. The MD was trialling a number of internal candidates to see who might be best for the role:

"...I am going to set four or five in a little sprint and see who is fit."

The trials were completely open and once the decision was made, the reasons behind it would be made common knowledge so that all Dallas employees had visibility. In fact, their customers were aware of, and were supporting, the process (following Wolfe et al, 2009).

Dallas’ key scenario planning was in its management of risk. It understood that customers such as Washington were not good at understanding, anticipating, planning for and managing risk on construction projects. It understood that this was a key part of its offering to the market and an area where it was important that their scenario planning was as accurate as possible as it effected the return it made on projects. Again, this scenario planning did not change the mental model of the organization and was therefore not LO scenario planning (Chermack et al, 2006) Dallas’ Washington team leader suggested that some customers consider carrying out
their construction programmes by purchasing a contractor and thereby not having to pay for external profit on the project and the risk management. He stated:

"I can see how a client could think "Oh god their 3% they're making I'll have that" save themselves 3% on £500m. That's worth having. But they'd lose that because they can't manage [construction risk]."

It was suggested that this had not happened due to Dallas’ ability to scenario plan for risk and manage it so well.

5.5.6 Kansas

Kansas had a plan in place to cut director salaries in the case of a downturn, which it needed to deploy when a downturn did in fact materialize. This was rolled down to middle management and eventually site staff as the recession took further hold. However, given the fact that all knew of the plan in advance, this news was received rather better than might have been expected. There were further plans on the table such as the stoppage of payment for travelling time.

Kansas, like many of the other participants in this herein reported research appeared to be survival learning (Senge et al, 1990, 1994) rather than generative learning through scenario planning. Kansas did scenario plan, but it was at the most basic level of organizational strategy, to reduce cost in response to a financial crisis. In addition, it did understand that such planning gave only short term relief from economic pressure and that it would need to plan for the restoration of the status quo at some point in the future. Its 'sharing of pain' strategy allowed Kansas to retain its team and to plan for an upturn in work. The focus group discussed Kansas' diversification of work being a scenario planning tool to guard against the impact of losing one of its current customers.

5.6 Summary

Within this Mental Models chapter, the analysis came from the case study work done on all six nominated contractors. It should be noted, however, that not all discoveries in all contractors were analyzed against all Mental Models elements. This was due to the differences in depth of demonstration of this LO discipline between the contractors. It is noted in the Conclusions, Implications and Recommendations chapter 10 that no one organization completely demonstrated all five of the disciplines of a LO as set out in Senge et al (1990, 1994) and that the analysis herein
drew together the better examples in each Mental Models sub-section from the six contractors and contrasts them against each other and previous research.

This approach, whilst it provided what could be suggested to be a best practice example of the deployment of Mental Models within a contracting organization, provided a idealist ‘tapestry’ which does not represent the reality for any one organization. In addition, some points brought out where there are notable failings in the six contractors to adopt LO processes which provided a contrast within the analysis. The same approach to analyzing the research was taken in the following chapter 6 which examined the Personal Mastery element of the LO model within the six nominated contractors.
6 Data Analysis and Discussion – The ‘Personal Mastery’ Element of the Contractor LO

6.1 Introduction

Senge et al (1990, 1994) suggested that the organization cannot learn if the individuals within it do not learn. A LO with individuals committed to Personal Mastery will have individuals that demonstrate more than competence. Whilst they will be committed to, and receive support for, formal training, they will also hold a vision for improvement of the organization and create the ‘tension’ required to realize the vision of moving the organization towards this improved state. Thus, such individuals never ‘complete’ their learning journey, but are constantly on the journey.

In order to assess the presence of Personal Mastery, the research looked for the contracting organizations to be able to engage in business change and improvement created by the individual. In addition, individual commitment to lifelong learning, and the support from the organization for individual learning was examined. The manifestation of Personal Mastery in the field (Senge et al, 1994) can therefore be observed as being individual commitment to personal development and individuals being empowered to create improvement within the organization. How these factors might manifest within the excellent performing construction organizations is analyzed in this thesis under two main headings. First, is the ability for individuals to change and improve their own environment. Second, is commitment to lifelong learning and concomitant support from their organization.

Each of the elements mentioned in the preceding paragraph are analyzed and discussed through the reflection of the observations within the six nominated contractors. Reflection is done not only against the back drop of Senge et al’s (1990, 1994) work, but broader work from within and without the construction industry. Whilst Personal Mastery as a discipline within the LO model from Senge et al’s (1990, 1994) is not challenged within this chapter, it is important for credibility and rigour to analyze and discussion the findings against the detailed, and more recent works referenced herein.

6.2 Change and improvement in the business environment

Organizational change and improvement in the context of this thesis was that of the empowered individual employing his/her own Personal Mastery to effect change within his/her own sphere of influence (following Styhre, 2004). It reflects the
continual learning mode in which Senge et al (1990, 1994) suggested members of the LO live. This continual learning was what was used to create some change within the organization.

6.2.1 Cincinnati

Cincinnati encouraged its employees to create organizational change and improvement through the formation of project improvement teams. These teams were deliberately not restricted to certain disciplines in order to imbue all members of the business with the appropriate drive and the opportunity to be part of this movement. In addition, the organization tracked the ideas which came from such forums to ensure that they were evaluated and implemented and that the business impacts were identified.

Cincinnati gave a simple example of this where a site operative had suggested an innovation that allowed them to keep trench ladders cleaner and therefore safer whilst in use. Cincinnati’s leader suggested:

"...the guys have put a grid at the bottom. So when he got out of the tank where he’d been digging, he then stood on the grid, bashed his feet. The mud then just drops through to the bottom and as he walks up the ladders, there’s no mud clinging to the ladders."

Whilst in the scheme of things this improvement might be viewed as a very minor improvement from a business perspective, it was clearly at the forefront of the minds of those interviewed for the research herein reported. The grid innovation quoted above demonstrated the level of respect shown for those who do improve the way the business operates, no matter how small the contribution may appear to be at first glance.

Such improvements at Cincinnati tended to be run as projects in their own right, for which people needed to be diverted from what might be considered their ‘day job’. Within a LO, however, business improvement was viewed as part of everyone’s day job (Senge et al 1990, 1994). Cincinnati therefore created a budget and a programme to deliver such improvements. Cincinnati’s leader stated:

"...you have execution plans: This is how we’re going to roll it out. This is the risk. This is the budget.”
The project was then allocated a project manager – where possible the person who brought forward the idea. Such allocation ensured maximum buy-in and enthusiasm around the project, as postulated by Carboni (1995). A leader was allocated to each area of the business to support and advise the person managing the change (where that person was not the leader themselves).

Cincinnati had what its employees see as an "...engineering background of problem solving..." culture. This, they opine, was because Cincinnati had an engineering background and engineers love to solve problems. They suggest there is, in addition, a "...culture of energy..." which came from the fact that the organization had two parent companies with such cultures. This means that people will take action quickly to solve problems and develop opportunities. The weakness of this approach exclusively was noted by Senge et al (1990, 1994) when he described Systems Thinking as accepting that the solutions of today were likely to cause the problems of tomorrow. Therefore simply having a problem solving culture had the potential to cause larger problems either elsewhere within the organization or in the future.

What definitely was encouraged at Cincinnati was for individuals to bring a solution to the table if they bring a problem or opportunity. This approach encouraged an approach of "This doesn't work, but I think..." as opposed to simply "It doesn't work", and looking for someone else to solve the issue. The approach moved individuals down the path of solutions thinking as opposed to complaining and required Cincinnati to encourage people to come forward with such issues in the first place. Cincinnati’s leaders ensured that their team understood that they were not going to be penalized for coming forward with such issues. It was much more likely that individuals would be penalized for attempting to conceal problems. In addition, there was no restriction on the level of person whom individuals should approach – there was a full open door policy.

Cincinnati had extended this message to its supply chain to ensure that there was consistency of behaviour within the supply chain. The focus group noted:

"We've stressed to them that if they think they've got a problem they should come and tell us."

There is, however, a question as to whether this approach was the best method to move ideas through the organization (Falconi, 1997; Shenhar 1993). Deeper research on the movement and implementation of ideas through Cincinnati might reveal the reality of this approach to improving the performance of the organization. Such
research was beyond the scope of this thesis and was noted as potential future research.

### 6.2.2 Tennessee

Tennessee had automated its business improvement system to make it as easy as possible for individuals to identify, recommend and become involved in business improvements. Its internal communication system had an interface which allowed individuals to send ideas directly to the business improvement coordinator. The business improvement coordinator could then work directly with the idea originator to evaluate and potentially implement the idea. In addition, this coordinator had an important risk management role to play in terms of making sure any good ideas in one area did not create problems elsewhere in the business. Such management was an example of Systems Thinking being used as an overarching discipline over another by tempering Personal Mastery for the overall benefit of the organization (Senge et al, 1990, 994).

Members of Tennessee pointed out, quite correctly, that this process could just as easily be done if someone picked up the phone, and the presence of the automated process was not the key element. The real impetus for change was the underlying culture which encouraged and supported individuals to make the changes in the first place, as suggested by Carboni (1995).

### 6.2.3 Indianapolis

Indianapolis tried to emphasize that people who come forward with improvement ideas will be listened to, applauded and taken seriously. During the case study, the point was made that Indianapolis understood that saying ‘no thank you’ to every suggestion will soon stop the flow of ideas. Indianapolis’ MD suggested the key to maintaining the flow of ideas was to reinforce the belief that such ideas will be acted upon:

> "...[an employee has] got to believe that we'll at least take him seriously and adopt it. I think that's not just [Indianapolis], that's the client as well.”

In addition, the directors understood that slow responses to ideas had the potential to stop the flow, and as such they were generally quick to respond to such things. Previous research had noted that without a genuine support for ideas, they will dry up (Falconi, 1997).
Indianapolis was, however, struggling to enable the flow of suggestions and improvements from all quarters in the first instance. This was in spite of the very flat structure which was designed to encourage such suggestion flow; a flat structure was noted as successful in previous case studies (Lloyd, 1996). In fact, the focus groups felt that the flow of business changing ideas upwards was better than the management felt it to be. The focus group noted the following regarding communication:

"...you heard it in the meeting. We communicate lots down. But we don't get anything coming back up."

The focus group also suggested that the structure and the availability of communication channels were excellent for encouraging idea flow:

"...it's a fairly flat structure but most people knew where to go with ideas."

This quote suggested a disconnection between employees' views of the quality of their ideas and management's view of the same ideas; although both agreed that management was voicing frustration about the lack of ideas coming through. Indianapolis, however, appeared to lack a transparent mechanism for evaluating employee ideas, which was considered to be an integral part of other cases (Lloyd, 1996).

At a project level, Indianapolis tried to empower its team to make decisions and run projects themselves without management intervention. Individuals suggested that they run ideas past senior management who generally approve them and then these ideas were implemented. It could be that the lack of management intervention and discussion made it appear to management as if there were not very many ideas and incremental improvements being made. The focus group defined it as a "moving process". The focus group viewed the culture as being one of "...don't be afraid to get it wrong...", similar to the case study in Kriegsmann (2005) when it came to improvement ideas. This was acceptable as long as the customer was also on board with any ideas that directly affect him/her. This shift was a direct departure from the usual construction industry culture of never admitting mistakes and thereby avoiding a financial claim (Rooke et al, 2003).
6.2.4 Chicago

Chicago was less empowered as an organization and business change tended to be fed back to management to implement. Their structure was flat such that the learning loop was a relatively straightforward and rapid process to implement. Chicago recently mapped their processes in order to enable process change to be more easily effected.

Individuals within Chicago, however, stated that they could see the implementation of some of their ideas. The discussion entered into by the focus group alluded to the process being a little haphazard. Discussions were around some ideas being implemented and some not, with no mention of what the evaluation process was nor how individuals discovered why their ideas may not have been implemented. Comments from the focus group noted the 'non committal' approach within Chicago:

"...the kind of things I've suggested have been considered, some changed some not..."

The advantage of not having a too formalized process, however, was the open dialogue around solutions and opportunities which they felt able to have as a business due to them being a relatively small and close team.

This apparent contentedness of Chicago with a flawed system contrasted drastically with Lloyd’s (2006) proposed best practice case study in a much larger organization. The dichotomy suggested that there may be a different set of best practice LO processes depending upon the size and makeup of the organization and that any organization can demonstrate a LO culture. This apparent flexibility as to what to look for when identifying a LO was a key criticism of Senge et al (1990, 1994) by Ortenblad (2007).

6.2.5 Dallas

Dallas’ process was an informal one of raising issues to senior management. It did, however, appear to always go through the senior management loop before change was implemented. A committee then gave a yes or no assessment of the idea, although it was stated that most changes were tweaks to an existing model. Where large changes in the business service were required, Dallas tended to enlist the help of experts in the field rather than rely on internal assessments and use of a formal system. It was suggested that there may not be much requirement for business
change due to the ability for individuals to make changes within the processes as they stand. Dallas MD commented:

...our management systems are somewhat different to most of the contractors in that they’re a little bit open to individual interpretation. We then monitor performance against it. We get a formal report back which identifies observations - which is where it says ‘They are not using your system but I don’t think they’re causing you any problem

However, the above approach did occasionally cause a flawed outcome which required an investigation from senior management. It may be questionable as to whether passing this level of personal risk to employees for departure from process encouraged or stifled improvement (Kriegsmann, 2005). In addition, the focus group was less enthusiastic about the informal process improvement approach. It was suggested that whilst improvement ideas were encouraged, they could end up being passed between, and discussed by, the directors and then rejected due to not fitting with the business vision or other systems. The focus group noted:

"...somebody came up with [an idea] and that would have...it was contrary to what we were trying to do. Management said no."

Such an approach to management rejection of ideas suggested that there might not be an open improvement discussion group which non-directors could join to develop ‘different’ ideas. Such a division of voices within an organization into ‘privileged’ and ‘marginalized’ was a noted criticism of the reality of the LO in Ortenblad (2002). In addition, if individuals were not clear on the organizational vision or impact on other business systems, then such lack of knowledge was seen to draw into question the presence of a true Shared Vision and the depth of the Systems Thinking.

6.2.6 Kansas

Like some of the aforementioned organizations, idea implementation appeared to be a weakness for Kansas as it openly admitted to having an open door policy for individuals to submit improvement ideas to the directors, but that ideas tended to wait before being acted upon by directors. This delay was either due to constraints of when the directors could meet to discuss the idea, or where those same directors were focussing on another area of the business because it may be struggling. Kansas MD pointed out its own weakness in the system:
“...an [employee] will come to you with an idea and you’re going “Great.” Three weeks later you still haven’t done anything to do with it. And you can tell their frustration...”

This quote suggested that Kansas may be missing out on LO opportunities due to management focussing too hard on solving the problems, which as Senge et al (1990, 1994) observed, was often the cause of future organizational problems.

6.3 Lifelong learning and support from the organization

The commitment of the individual within the LO to individual learning that continued throughout their career was essential for the organization to keep pace with change in the business environment and maintain competitiveness (Keep, 2000). Senge et al (1990, 1994) noted that this notion of learning was that the individual never actually arrived at a destination and that learning was a journey towards an unknown destination. Therefore, for the purposes of this thesis, the organizations were assessed for their individuals’ long term commitment to the learning journey and the support which the organization provided to allow them to realize their vision.

6.3.1 Cincinnati

Cincinnati’s approach to lifelong learning was with a two stream approach. They recognized the weakness of individuals only being able to progress their careers through a management route. Cincinnati had been able to establish an alternative technical specialist route for those who wished to stay technical as opposed to managerial. The old Mental Models that people could only attain a certain seniority when they had a certain number of reports were slowly breaking down. Cincinnati’s leader noted a few areas where Mental Models were changing in terms of staff grades being only related to the number of direct reports:

“...you haven’t even got anybody who reports to you, yet you’re a level one. What an easy life you’ve got!” But I couldn’t do what they do.”

Central group prepare a learning programme based upon personal goals and skill set requirements (following Petroni, 1999). The principle, at all levels of the organization, was never that someone was trained once, deployed into a role and forgotten about. The main piece that drove the personal development was the underlying business succession plan, which suggested a good link between these two business processes.
Cincinnati’s approach created a network of learning and training programmes for every stage of the individual’s career. The approach to first year trainees was for them to spend their first year learning how to do the job before they even set foot in an office. Cincinnati’s leader recalled:

“...I didn’t even step in the office for the first year. I spent it in a training centre learning how to do practical engineering side of things...”

In this way, they were likely to remove some of the pressure on the experienced office staff to train extremely ‘green’ trainees. It was likely that this approach improved the quality of work produced by the office as it did not have to ‘carry’ these staff for their first year.

In addition, Cincinnati sponsored key members of staff to complete a Master of Business Administration (MBA) degree on a full time basis and with full pay. These degrees could be taken when the individual and the organization agreed that business and personal circumstances were aligned. In terms of starting learning for their junior staff, Cincinnati tried to give them as much responsibility as early as possible. It then had its senior staff manage and mentor the juniors. One interesting comment made by one participant of the focus group was “...it’s courses galore...” in terms of developing the senior staff. Blackman & Henderson (2005) noted the weakness in a ‘courses galore’ approach to developing a LO and confirmed Senge et al’s (1990, 1994) position that action learning was the better way to develop Personal Mastery. The reliance on courses suggested a weakness in the Cincinnati Personal Mastery model when compared to Senge et al’s (1990, 1994) model.

6.3.2 Tennessee

Tennessee did not have a formal Continuing Professional Development (CPD) programme. Its approach was to have a commitment to their people to ensure that they were content in their roles. Such commitment from the individuals enabled them to take control of their own learning and development in order to give the most in their role. In addition, Tennessee tacitly rather than explicitly expected its employees to comply with the CPD requirements of their respective professional bodies. Tennessee’s MD commented:

“...getting [employees] to do that is one of the basic culture items of the company.” “...that is part of this issue about how people in an organization do, sort of, belong to it. Focused in what it is that they’re doing, that the
company actually commits to them being satisfied with their lot within the company. And out of that comes a willingness and a wish to actually make sure that they do their best for the company. And how do you do your best for the company? Well you make sure that you keep up to date for a start...

Tennessee did have a learning and development manager who provided support as required, but it was up to the individual to take ownership of their own development; which was how Senge et al (1990, 1994) suggested Personal Mastery ought to happen.

6.3.3 Indianapolis

Indianapolis's key position on lifelong learning was that the majority of their staff did not leave the organization, but rather spent their entire career at Indianapolis. This meant that they were living and learning the organization's culture for much of their lives. This culture, it was suggested by the MD, was that of "...Indianapolis being better tomorrow than it is today..." Indianapolis suggested that it learns together as a family through shared experience and communication.

Indianapolis admitted to having no formal structure, policy or process for encouraging, enabling or supporting lifelong learning. There was a personal development planning process, but the directors admitted that this did not work particularly well. It did not see this as a weakness, because it suggested that the family atmosphere and family approach as being a powerful tool in lifelong learning. The MD suggested:

"How does the family learn? You know it learns through experiences. It learns through the communication. And that’s the way we are."

Individuals were still encouraged to achieve professional qualifications, but without a well-working formal planning process to support them it appeared that Indianapolis may be abdicating too much responsibility for development to its staff.

Indianapolis felt that the flexible approach to training that they gave their staff, which involved giving them an understanding of other team members' roles, was another positive. This approach allowed Indianapolis to be flexible in terms of having multi-skilled individuals who understood how the rest of the organization worked, as the MD noted:
"...I want the benefit of [Indianapolis employees] being cross discipline, agile and flexible. So that if you think about it, if I've only got a cost manager, but I need a construction guy on another job...I want to be able to say 'right, great you're not totally 100% construction. But you understand it enough to be able to do that role for me.' And that’s where you become agile and that’s where you add value to your client."

The advantage of such a Systems Thinking approach to Personal Mastery (Senge et al, 1990, 1994) was an absence of the silo and boundary mentality prevalent in the construction industry (following Ankrah et al, 2009). Indianapolis also accepted that this did make its employees more marketable from a recruitment perspective, but accepted this as part of the reality of business.

Following on from this, Indianapolis was starting to raise the profile of ‘attitude’ in comparison to ‘technical competence’ in the selection and development of people and supply chains. A member of the focus group asked "...it's the right person the right attitude, they can learn to do the job can't they?" There was a general agreement in the room from the focus group to this rhetorical question.

Sagar (1980) differentiated people with positive attitudes as ‘improvers’ as opposed to ‘non-improvers’ who were those with poor attitudes. Indianapolis, therefore, were looking to hire ‘improvers’. For development of their own people, Indianapolis had developed its own system called ‘I-Train’ which covers technical and behavioural competencies.

6.3.4 Chicago

Chicago had a similar stance on lifelong learning to Indianapolis in that they suggested that there was no substitute for learning through doing and that this stance had been very successful. Its MD admitted, however, to having to add a necessary change into the system in order to encourage people to learn, saying:

...my job really is to just keep challenging and pushing and you know people get so frustrated with me because I'm constantly fiddling with systems and suggesting productivity aids and encouraging people to try new ways of doing things. And altering structures, but I think that's my job isn't it; I've got to keep challenging and that forces people to keep learning...
It could be suggested that the MD was trying to challenge people’s Mental Models in order to necessitate learning. It may be argued that Chicago’s position, which was much like the other participants in the research study reported in this thesis, were aware that lifelong learning had to be led by the individual and the business did not drive it through a formal process. Basic education and qualification in the business essentials, such as NVQs, was encouraged and some directors within Chicago encouraged their teams to gain further formal qualifications. Even accepting this encouragement, all participants confirmed that the onus was always on the individual to push themselves and then the support would be provided by Chicago. During the focus group, there was a lot of discussion around wanting to do further study, but work commitments not permitting the time. A general comment from the focus group was:

*I always had this whole idea when I came out of university about going on and do another course afterwards and definitely getting my Chartership for building. But it’s just one of those things as soon as you get into work and you’re working away you just...It just vanishes. And I’ve been meaning to do it for ages.*

It might suggest that Chicago had a culture where formal qualifications were not viewed as a source of business excellence; a view which was in fact supported in research (following Fonda & Smilansky, 1994). Support to the individual taking qualifications was decided on a case by case basis and Chicago had made use of ‘coaches’ for their directors and some key project managers to develop competency where needed.

### 6.3.5 Dallas

Dallas suggested that its training and development of new trainees was amongst the best in the industry, but admitted that after trainees reached their chartered status, Dallas was not brilliant at taking personal development further. An example was given of a recently chartered employee who wanted to do a Risk Management Masters degree, but who was being discouraged because she could not demonstrate a clear benefit to the business. Dallas did not wish to garnish CVs with qualifications for the sake of it. The strategy for this person was for her to spend time with Dallas’ three best risk managers to learn as much as possible and then the Masters would be reconsidered. She commented that she was advised:
...go and talk to these three people, look at their risk registers, talk to them about your job. They’ll all be quite happy to help you compile your own risk register and let’s see how it goes. Come back and tell me at the end what you got right, what you got wrong, what risks you controlled and then let’s get you off on a Masters degree.

In addition, Dallas had an internal prospectus of 400 courses which were usually selected by individuals for personal development during their appraisals. This appraisal process flowed from, and was linked to, the overall business plan which ensured role alignment. The process highlighted areas and directions for personal development which combined the business and individual needs as one. Alongside the ‘Academy’, Dallas offered first degrees which were created specifically to improve upon the formal education offered by Universities which Dallas stated was ‘boring’ their trainees. Therefore it had created a degree course which aligned with the interest trainees got from their on site learning environment. Dallas team leader for the Washington commission stated that:

...we set up our own degree course in [location] and that’s a general construction management course...” “So they come out with a basic understanding but then the Academy trains apprentices as well. Generally about 50 a year bricklayers, carpenters and some decorators... the knowledge that probably 70% will leave us but there will be a number that will stay with us....

Dallas’ position here appeared to be well aligned with Senge et al’s (1990, 1994) position on Personal Mastery, where it was defined as a journey of personal enlightenment which served to change the organization itself (Garcia-Morales et al, 2007). Many of the other participants talked almost exclusively about the development of the individual as a destination ending in a qualification without reference to the impact upon the organization.

Part of Dallas’ early development of trainees was not to pigeonhole them as project managers, quantity surveyors, architects, planners or similar. Dallas gave them the opportunity to spend a couple of months within each department, should they so choose, to gain an understanding of where their career might best lie. In addition, this developmental approach gave all trainees a better Systems Thinking understanding of the organization and the industry (following Senge et al, 1990, 1994). The MD of Dallas started his career this way and recommended it to new
starters as the best way to find personal direction. Indeed, more experienced members of the organization were still moved around where relevant to their learning and development. A focus group member commented that:

"...you’re watched sort of you know, you’re interacting with people and that. And if they think you’ve got a capability for doing something they’ll tend to sort of, you know, move you forward or into a different area...”

Dallas used to have a different approach to lifelong learning in terms of taking individuals through their career. It used to be that individuals would start at site labourer level and work their way through to project manager level. However, given Dallas’ move to a more ‘management contractor’ model relying on subcontractors to supply site operatives on projects, they now had individuals coming in at trainee project manager level instead and going through the ‘Academy’. This approach, Dallas admitted, was not as good a route as before, so it tried to get trainees on site as much as possible to observe and to ‘make mistakes and learn from them’ (Kriegsmann, 2005). Dallas’ team leader for the Washington commission asserted that:

...the difficulty for us is letting someone do something and making a mistake. Accepting that someone learning is going to make a mistake. It’s very easy to do everything yourself and jump “You’re doing that wrong, do it like this”. They don’t learn anything by doing that. Let them make a mistake, it’s not a problem once. It’s not a real problem twice....

Dallas did have understanding customers who accepted having such trainees on their projects and that such mistakes were part of the learning process (Kriegsmann, 2005). Dallas’ team leader for the Washington commission followed up with:

...we do consult [Washington] and if we’re going to put somebody in the firing line, one of the Assistant Project Managers in the firing line to do a particular task, say give them a piece of the work to do and say ‘Right that’s yours, you’re responsible for it’. We’ll talk to the [Washington Project Representative] first and say you know and 99 times out of 100 they’ll say ‘That’s good you know give them a chance to develop and go for it.

The ‘Align’ team within Dallas had its own personal development budget in order to keep themselves up to date with new technologies to bring the learning into the organization. This team was actively encouraged into keeping their lifelong learning
completely up to date to ensure that they did not fall behind their competitors. This approach, however, did not suggest a LO in Senge et al’s (1990, 1994) terms where individuals choose to engage in lifelong learning in order to be able proactively to shape their environment.

6.3.6 Kansas

Kansas sought to develop people from entry level to management level and tended to work with those who put themselves forward for new roles. It had appreciated that individuals may not perform or grow within a role that they do not want, even if it did look like a good career opportunity. Kansas MD indicated that:

“...[director] who owns Kansas Joinery he’s a very encouraging man for people to get on with in the business. But once he gives you something he tends to let you just get on with it. Because you’ll either make a good job of it or you’ll just fall to the wayside, do you know what I mean? And he’ll support you on the way up there but he won’t push you to the extent you’re somewhere where you don’t want to be.”

In addition, the directors appeared to understand the principle that if someone could not be replaced, they could not be promoted. Kansas MD stated: "...I want you to have my job because if you have my job that means I can move on to another job."

Kansas also provided support to individuals who wished to take formal courses. This support took the form of payment of fees and time off for study. In fact there were compulsory levels of study which the organization required and in some cases individuals were seen to need to be strongly encouraged into taking the study. In some instances individuals took it upon themselves to gain formal training and qualifications without the organization’s knowledge and then informed it afterwards, rather than ask for support up front. Kansas’ directors speculated that this might be because individuals did not wish to take the risk of having business support them on a course that they subsequently failed and with then feared they might jeopardize their position as a result. The MD stated:

“...if [employees] fail and they don’t make it, it’s not... They think it might affect their employment within the business. But it doesn’t really with Kansas if I am honest...”
Fear of failure was seen to be a key element holding back many organizations from becoming LOs (Simpson, 1997). It was made clear during the herein reported research that Kansas did not view a failed course as being a weakness in an individual, although a passed one was viewed as a strength. If individuals were making a different assumption, then there appeared to be a disconnection between the directors’ message and the employees’ beliefs, a disconnection that might suggest a lack of a Shared Vision being demonstrated in the Personal Mastery arena (Senge et al, 1990, 1994).

6.4 Summary

Within this Personal Mastery chapter, the analysis again came from the case study work done on all six nominated contractors. It should be noted, however, that not all discoveries in all contractors were analyzed against all Personal Mastery elements. This was due to the differences in depth of demonstration of this LO discipline between the contractors. It is noted in the Conclusions, Implications and Recommendations chapter 10 that no one organization demonstrated all of the elements of a LO and that the analysis herein drew together the better examples in each Personal Mastery sub-section from the six contractors and contrasted them against each other and previous research.

This approach, whilst it provided what could be suggested to be a best practice example of the deployment of Personal Mastery within a contracting organization, provided a idealist ‘tapestry’ which does not represent the reality for any one organization. In addition, some points brought out where there are notable failings in the six contractors to adopt LO processes which provided a contrast within the analysis. The same approach to analyzing the research was taken in the following chapter 7 which examined the Shared Vision element of the LO model within the six nominated contractors.
7 Data Analysis and Discussion – The ‘Shared Vision’ Element of the Contractor LO

7.1 Introduction

Senge et al (1990, 1994) suggested that a Shared Vision held by a LO could be described in more detail as a shared picture of the future the organization seeks to create. It was seen to be distinct from the all-too-familiar vision statement which was often nailed to the wall of the reception of some organizations which may have been written decades ago and had become part of the furniture. Senge et al (1990, 1994) postulated that having a Shared Vision enabled other LO disciplines, such as experimentation and innovation, to be achieved. The Shared Vision did this through ensuring that individuals committed as a group to the organization and personally wished to excel and learn rather than having to be encouraged or forced to grow.

Senge et al’s (1990, 1994) position did not mean that the vision could not emanate from the leader with the rest of the organization committing to this vision, although they must be able to modify and clarify the vision through their interactions with it. What was clear was that a Shared Vision could not be directly imposed onto the organization by a powerful minority. In order to identify the presence of Shared Vision, the research reported in this thesis examined the prevalence of elements suggested by Senge et al (1990, 1994) as being essential to developing the vision. These were the development of communities of practice for like-minded individuals to come together to develop the vision; the ability for individuals to live the vision through the demonstrating leadership at all levels within the organization; the aligning of individual and business needs; and most importantly the presence of, and agreement with, an organizational vision as a whole.

Each of the elements mentioned in the preceding paragraph are analyzed and discussed through the reflection of the observations within the six nominated contractors. Reflection is done not only against the back drop of Senge et al’s (1990, 1994) work, but broader work from within and without the construction industry. Whilst Shared Vision as a discipline within the LO model from Senge et al’s (1990, 1994) is not challenged within this chapter, it is important for credibility and rigour to analyze and discussion the findings against the detailed, and more recent works referenced herein.
7.2 Communities of Practice

A Communities of Practice is defined in Loyarte & Rivera (2007) as

"...an activity system that includes individuals who are united in action and in the meaning that action has for them and for the larger collective“.

It is further noted that they are informal entities that exist when people participate in problem solving, or acting upon opportunities, and share knowledge necessary to complete the task. Communities of Practice can therefore be viewed as vehicles to create, maintain and exchange knowledge within an organization (Senge et al 1990, 1994).

7.2.1 Indianapolis

Indianapolis used its customer delivery teams to create communities of practice. It described each unit as a little family within the overall family that was the organization. The suggestion was made that all within these communities understand the various strengths and weaknesses of the other members as they worked together all the time. The situation was not, however, formalized as communities of practice as such; although this may not be felt as necessary within an organization this size, as noted in the focus group:

"I also think, because of the size of the company we are, we talk about a ‘family’ but what it really is, is a society in a way. We are that size where we are a society. And everybody virtually knows everyone else...“

Du Plessis (2008) noted that fully implementing communities of practice within smaller organizations can, and did, support the flow of innovation and knowledge. It appeared that Indianapolis might not be exploiting this LO resource to the full.

7.2.2 Tennessee

Tennessee developed two types of community of practice, labelled "...product groupings...” and "...process groupings...” The product groupings were expert representatives from various sectors who came together to exchange knowledge about the sector. The process groupings were similar, but these groups were comprised of individuals who were experts in the same technical or professional field. These groupings demonstrated a ‘roles-based’ approach which enabled the
improvement of individual and team job performance and productivity (Hemmasi & Csanda, 2009).

7.2.3 Dallas

A conscious effort was made in terms of seating arrangements in the Dallas organization office to encourage informal discussion between those in similar professions. Whilst this arrangement in itself did not create communities of practice, Hemmasi & Csanda (2009) noted that the best performing communities of practice tended to be informal ones.

Outside of socializing and the informal communities that came about on projects, Dallas did not create or encourage communities of practice. Such an approach was suggested by Hemmasi & Csanda (2009) as being a ‘project-based’ approach to communities of practice; or ‘emergent’ communities of practice (Juriado & Gustafsson, 2007). Dallas’ focus group bemoaned the transient nature of the industry given its project based status which made forming communities of practice difficult:

"...you can be working away to what you think is right and occasionally sort of it's not the same as what another site is doing. And you think, "Oh I wouldn't have done it that way" or whatever...there's not an awful lot of communication between the different teams...”

The scenarios noted above appear to suggest that within Dallas, the project based communities worked better than roles based communities, which might suggest that project level learning was being lost.

7.3 Demonstrating leadership at all levels

Senge et al (1990, 1994) noted the need for the LO to be able to demonstrate that all members could adopt leadership behaviours when necessary and not rely on titular leaders to provide all leadership. This is not to say that anarchy of everyone trying to lead should prevail, but that the appropriate person is leading at all times whether that should be a board member or someone with ownership. Senge et al (1999) defined several types of leader for several situations – executive leaders, line leaders and network/community leaders.
7.3.1 Cincinnati

Cincinnati actively encouraged leadership demonstration at all levels to enable individuals to identify themselves for promotion through the business. The onus was still on the individual to step forward, but the demonstration of leadership itself was what was supported by the business. Cincinnati’s leader cited an example of a document controller who had started to take informal leadership responsibility (following Neubert & Taggar, 2004) for her area and now worked autonomously managing document controls for Cincinnati:

“...Lynne, for example, used to be document control, not the highest level in the world, but she’s developed from her own little areas. She’s expanded it up. She’s now Head of Waste Water for document control. She’s now head of non-infra for document control. She’s now moving in there and we love that.”

Senge et al (1990, 1994) noted that leadership did not need to be shown as groundbreaking, but just as the ability for individuals to demonstrate leadership in their own field or area of influence within the organization.

7.3.2 Tennessee

Tennessee viewed individual leadership as a current hot topic which it was working on at the time the research for this thesis was undertaken. It was carrying out extensive employee research and one of the topics being covered was leadership generally. Tennessee’s research was prompted by some vocal criticism of the management levels and their leadership. Although ironically, Tennessee’s own research had eventually shown good reviews for leadership generally within the organization.

Tennessee’s research was done at the same time as rolling out a personal leadership programme to encourage people to take leadership at all levels. This programme was designed to raise employee cognizance of the fact that they were required to step up and show leadership where necessary, especially at a site level. The MD noted:

“...we’ve already set off on a sort of personal leadership programme for people so that, recognising that even if they are the ganger on site they are still leaders...”

This process suggested that Tennessee was actively looking to create the impetus for individuals to take leadership responsibility.
In addition, Tennessee was trying to align this training to a culture change whereby employees did not just view those with leadership titles as leaders, but realized the need for all employees to demonstrate leadership:

"...even the person at the bottom of the pile, the site labourer yeah, can actually demonstrate leadership qualities by saying ‘don't go up that ladder, it's not tied.”

It suggested that the decentralized nature of the organization helped such a culture to develop. If the organization was viewed as one centralized entity then people might feel removed from the leadership and influence process.

7.3.3 Indianapolis

At Indianapolis, the site managers were the best example of individual leadership demonstration. However, all in the organization were expected to try and continuously change and improve. The focus group related that one of the site managers has recently taken on the responsibilities for the IT setup on his sites to save the IT department having to come and do it. One focus group member stated:

"Because we're doing quick three, four week jobs, setting them up quick and doing it. He said, I'm quite good on I.T., why don't, rather than the I.T., department doing it why don't they give me the box of tricks and I'll do it while I'm down there doing the phasing and stuff.”

Indianapolis’s management suggested that approaches such as this allowed people to have greater ownership of their projects. They did note the paradox that the more leadership an individual demonstrated, the less individual plaudits they received. Plaudits tended to be given to those closer to the work delivery and/or at a more junior level, particularly from the customer.

The above paradox was interesting and appeared to be a key omission from Senge et al’s (1990, 1994) model. The more that an individual demonstrated leadership, the more removed from the customer feedback they became. It could be postulated that those who were most motivated by positive individual feedback may be discouraged from seeking leadership roles. These individuals may be more comfortable in a follower role where they could receive the mainly positive messages they crave. This observation aligned with the research of Drake et al (2007) who suggested that
positive feedback had more of an impact on individual performance that financial (such as promotion) incentives.

7.3.4 Chicago

Chicago expected its employees to demonstrate leadership on a regular basis and suggested that their customers, particularly Minnesota, would find it surprising if Chicago did not give employees the opportunity to do so. The MD stated:

"...if I showed up to check that it was okay they’d think I was insulting the guy that was doing it because they trust him so much..."

This view lent further support for the necessity for the construction LO to receive a drive from their customers, departing from the assumptions of Chinowsky et al (2007a) and Maqsood et al (2007) that the LO can develop independent of customer influence within the construction industry. An example was that one of Chicago’s project managers had started to manage projects autonomously on the continent without the need for intervention from Chicago’s senior management. This individual was an example of individual leadership supporting the Shared Vision (in this case diversification) of the organization (following Senge et al, 1990, 1994).

The job roles within Chicago were specifically designed to create the ability for people to take on a leadership role. The entry level role in Chicago was that of ‘site manager’, which was a role that entailed the management of subcontractors on site. Chicago’s MD commented:

"...everyone is managing. So you know I don’t think that question has a lot of meaning for us really."

This role, therefore, required a certain level of leadership and individuals assuming this role were to an extent expected to be able to demonstrate leadership immediately. It was the site manager’s responsibility to provide leadership to the subcontractors on site and ensure that the project was tightly managed. Senior management acted in a consultative role to provide assistance and leadership support when needed.

7.3.5 Dallas

Dallas encouraged its employees to take leadership if they saw something on a live site that did not appear correct; which could be from a technical, project or health
and safety perspective. They were given carte blanch empowerment from management to stop all work and to report to the project manager what might need attention. This was similar to the empowerment to halt production principle employed by Toyota on their production lines (Liker, 2004). Dallas’ team leader for the Washington projects noted:

“...if a surveyor is walking around site and thinks that foundation should be a lot deeper than [it is being cast]... he’ll go in to see the Contracts Manager or even the Site Manager and say ‘Pull out that drawing and just check that...”

The MD had actually tested this point by deliberately entering a site enclosure without relevant safety equipment. Junior members of staff were expected to stop him from entering site and were rewarded if they did so. Thus far, these individuals usually passed the test.

Within the fast track environment of retail construction, Dallas suggested that everyone must demonstrate leadership in order to simply get the project completed. All members of the Dallas organization had to take ownership of their role and not wait for instruction from management. Fast reaction and action were necessary to make such projects a success. Dallas suggested that there was little time for an empathic approach in such an environment and that not all individuals were suited to work in it. Dallas’ MD said:

“...you have to want to be the leader, so we will often be described as arrogant and brash and not very empathetic. I think that’s a common trait in fast track retail construction and I don’t think you can be successful any other way.”

It appeared that Dallas had indeed learned the need to act this way as an organization through encouraging individual leadership. Millet & Sandberg (2005) suggested that empowerment was a solution to the problems which arise as part of working in a high pressure arena. Millet & Sandberg’s (2005) position suggested that combining individual leadership with high pressure might be a better LO solution than it might first appear.
7.4 Aligning individual and business needs

Senge et al (1990, 1994) referred to alignment of the individual and business needs as a sort of natural facing towards a ‘magnetic north’ or orientation point. Such a point would almost be pulling the business and the individuals towards their future. He suggests that it is almost a natural phenomenon of Shared Vision if the organizational change is being carried out well.

7.4.1 Cincinnati

Cincinnati tackled the issue of aligning individual and business needs through their Personal Development Review (PDR) system. Their strategy was to align the most senior members of the organization’s personal goals to the organization’s overall goals through their PDRs. Then, each member of the organization below them had their PDR aligned with their line manager dependent upon their own personal goals. Cincinnati’s leader noted that the process flowed from his parent company’s MD, advising:

"...the way they do it, I can’t fill in mine until my boss has done his. So the MD’s actually done his now. So the next level do theirs...."

Such alignment allowed the PDR process to serve a purpose for both the organization and the individual and ensured that there was as much alignment and as little misalignment of goals as possible.

Such an approach was similar to the ‘Investors in People’ model set out by Mason (1994a) which advocated clear alignment between departmental and individual goals. Cincinnati accepted that its approach left a time lag between PDRs as they were passed down through the organization, although this lag was felt to be a small sacrifice to make for excellent goal alignment.

7.4.2 Tennessee

Tennessee discussed the opportunities for personal advancement within its and its parent organization as the source for alignment. Similarly to Cincinnati, alignment was managed through the PDR process (Mason, 1994a). The key difference within Tennessee’s system was that the Human Resources (HR) representatives from each operating division within the organization had sight of all instances where individuals highlighted a desire to work in a particular area or specialism.
With this information Tennessee HR could align strategic opportunities identified at a business level with opportunities individuals were seeking. Such alignment allowed for the easy and frequent transfer of individuals between elements of the business. Transfer was seen to improve the knowledge and experience transfer within the organization as a whole (Senge et al 1990, 1994) whilst allowing the individuals to fulfil their own needs. Tennessee’s MD advised that:

“...where an individual is flagging up that actually he would like to go and work not on buildings but on the railway for instance, yeah, it’s, it really is quite easy for us to be able to effect a transfer...”

This approach was very similar to the process deployed in manufacturing such as in the Volkswagen-Skoda partnership (Gutmann, 1995). The difference with Tennessee’s model was that the intention was not to transfer knowledge from one business partner to another, but rather was part of an ongoing business improvement initiative.

Having an ability to move people easily within the organization was also seen to improve Tennessee’s competitive advantage and quality of service (following Gutmann, 1995). Such improvement aligned with their business strategy. Having people with different backgrounds throughout the organization allowed operating divisions to subcontract effectively with each other at net cost. Other organizations without this flexibility may need to buy experience to gain the same advantage as Tennessee suggested it possessed.

### 7.4.3 Indianapolis

Indianapolis suggested that their business philosophy aligned very well with individual needs. A member of the focus group postulated:

“...obviously people want to progress, they want to be happy with their work, they want to feel they’re going to work for a good company and they’re going to get satisfaction from their job. They’re going to learn and progress.”

The Indianapolis focus group discussed individuals who were able to align their need to change roles or progress through the organization. The lead from the directors was that individuals should not wait to be told to do something, they should take the
initiative by default, with management only intervening where requested. Another focus group participant stated:

"It's trusting as well that the people working around you trust you enough to know that you're going to go up there and do the work..."

In addition, Indianapolis ensured that new employee inductions covered not only their own values and goals, but also those of their key customers. This process ensured alignment between the individual, organization and customer. This process might be relatively innovative within the construction industry, although in depth verification of this is beyond the scope of this thesis.

7.4.4 Chicago

Chicago was acutely aware of the fact that if it became a bureaucratic machine which constrained the actions of its employees then it was likely to lose some staff. In addition, it was also aware that some individuals would actually prefer to work in an autocratic and/or bureaucratic environment. This last point was in sharp contrast with the reams of ‘autocracy was bad for the organization’ literature of recent times (Jones, 2003) and was also not in line with Senge et al’s (1990, 1994) LO model. Chicago understood that empowering willing individuals and allowing them to align their personal goals to that of the organization was key to staff retention in a competitive talent market. Chicago’s MD said:

"... we feel entitled to job satisfaction and lifelong learning and riches. And all the rest of it so - and different people are going to come at that differently, you know, I mean some people who work here who I have been thinking for the last 10 years, ‘They’ll hand in their notice tomorrow.’ You know they’re so bloody good I don’t know why they’re staying; they could go and earn twice as much somewhere else."

In order to assure that the organization allowed its employees to best align their goals with the organization, Chicago had taken the first step in understanding that all employees had different needs. This insight allowed them to retain their talent by allowing people to develop their role to suit.

7.4.5 Dallas

Dallas talked enthusiastically about its ability to promote internally and develop its internal talent. It did not until recently align individual needs to organizational goals.
A change was made recently to their appraisal forms and process which now aligned individual needs, business targets and strategy, and training needs (following Mason, 1994). This change had yet to be really tested in the long term to establish whether the system was now working to create alignment.

It was noted that the Dallas focus group was currently unsure of whether there was alignment between individual and organizational goals, but they assumed that alignment. One key theme which emerged was individual pride – pride in delivering projects on time and to budget. Dallas suggested that this pride was visible in the effort and time that individuals committed to making their projects a success.

The use of the word pride linked with the reference to family atmosphere was interesting as it suggested that Dallas had the same approach to its employees as Bacardi-Martini (Kirby, 2005), albeit less developed. There is, however, clearly a need to communicate how aligned to Bacardi-Martini’s best practice Dallas’ approach might be, as the focus group clearly noted a communication breakdown in understanding how their organizational pride might create (or indeed came from) good alignment of goals.

### 7.4.6 Kansas

Kansas alignment appeared simply to be that individuals were part of Kansas to make money and Kansas existed to grow and make money too. This observation suggested that thinking about goal alignment was not at the forefront of thinking within this organization.

### 7.5 Organizational vision

Organizational vision remains the most abstract of Senge et al’s (1990, 1994) concepts behind the LO model. Foster & Akdere (2007) conceptualized it as something which offers direction to an organization and that helps increase organizational success. In addition, he noted the lack of research into the area specifically and therefore the lack of an accepted definition. This in turn suggested to Foster & Akdere (2007) that visions were not as effective as they could be at driving success. Nonetheless, organizational vision was a key element of Senge et al’s (1990, 1994) Shared Vision model.
7.5.1 Cincinnati

Cincinnati’s vision, whilst being the laudable one of ‘taking the lead’ among its peer group in terms of innovation and organizational progress, still appeared to be dictated rather than created. The organizational vision was reinforced to employees during presentations given by the senior members of the organization, albeit commitment to the vision appearing to be lacking. One member of the focus group stated that:

“...in our morale survey is that we either [no ‘or’ stated] get feedback on the fact that some of them don’t appreciate all the vision that they get shown...”

The lack of commitment to a dictated vision was apparently a common organizational problem, as noted in Senge et al (1990, 1994). A LO cannot have such an approach to organizational vision creation. By definition (Senge et al 1990, 1994) it must be created from a shared position.

7.5.2 Tennessee

Tennessee did not bother with visions at all. It did not have an organizational vision, nor did it have them at operating division level. Instead, it had a series of commitments which were prominently displayed on its website. Again, each of these was quite laudable in its intent, but there appeared to be little insight as to how these were developed and to what extent the organization’s individuals helped to develop, update and actually strive to achieve those commitments. Furthermore, when these commitments were examined, they were very reminiscent of a broken down vision statement when analyzed against Senge et al’s (1990, 1994) model.

7.5.3 Indianapolis

One of the Indianapolis senior managers, the team leader of the Miami commission, felt that he was at his most motivational when delivering his vision to the team. Reflecting on the lack of feedback and innovation from staff generally which was bemoaned by senior staff at Indianapolis during the course of the research; there may be a link between the fact that the vision was being delivered rather than constructed collectively (following Hodgkinson, 2002) and the fact that individuals did not feel empowered, or the need to feed innovation back. The specific link between the two phenomena was not investigated specifically. The Miami commission team leader did however believe that he created motivation within his team to overcome obstacles and blockers. Others within the Indianapolis focus group, however, did seem to all repeat the same vision – that of being “…more than just a builder...”
The Indianapolis vision appeared to be adjusted through customer interaction. The
focus group advised:

"...the overall vision doesn't change really. We just reinforce the message of,
as I keep saying, delivery, certainty, quality, do the best job you can for your
client and understanding it. Updating it we probably tweak it and we vary it
bit to bit to what the client's current needs are...."

This position of having the Shared Vision adjusted through customer interaction was
a departure from Senge et al's (1990, 1994) model which assumed the vision was
constructed from within the organization. It was seen to parallel the similar customer
influence alluded to in the Mental Models chapter of this thesis.

7.5.4 Chicago

Chicago’s vision, or guiding principles as the vision was referred to, was one of
excellent customer service – albeit that Chicago conceded that this service did cost
their customers a premium. Its organizational vision was taken from the MD's
personal vision. The MD stated:

"I think we have some guiding principles here, I think they're well
understood because I have enough meetings far enough down the
organization to make sure that people hear what I think. And what I think
definitely changes with the changing context in which we work..."

This quote suggested that the vision within Chicago was not a shared one in the
terms that Senge et al (1990, 1994) suggested, but was imposed from the top. This
was not to suggest that the business did not support the vision, but it did question its
ability to influence and shape it. This position was confirmed during the focus group,
where one member commented:

"A new mission statement was sent out, new logos were produced, new
company branding, colours, all that kind of stuff. So definitely that has sent a
new communication out to everybody..."

Further to this, the focus group’s language continually referred back to how the MD
wanted the business to be run. This suggested that individuals, rather than helping to
shape the business vision, were simply reflecting the required vision back to the MD
and adjusting their vision to that which he expected. This approach was not
consistent with what Senge et al (1990, 1994) proposed whereby the leader’s vision
was grown by the individuals in the organization. Fowles & Edwards (1999) offered a practical case study of how a leadership vision became a Shared Vision, creating real business results, which suggested that there should be a greater element of Shared Vision implementation within organizations such as Chicago.

7.5.5 Dallas

Dallas showed an excellent development of organizational vision in terms of all participants in this thesis research relating the same vision. Dallas’ business vision was one of keeping the customer happy and doing everything in its power to ensure that that happens. The theme of all members of Dallas demonstrating a personal will to keep customers happy ran throughout the case study. It should be stressed, however, that all respondents noted that this did not include a high commitment to innovation, rather being excellent at the basics. One focus group member commented:

"...the vision is to keep the client happy and for the last three years since we’ve been running it...change could happen tomorrow I suppose because someone could come and think of we want to do this instead now, we want to be the most innovative contractor in Washington, might change I doubt it but we’re not like that. It’s one of the criticisms of the Group really that we’re...we don’t come up with brand new radical solutions, we just do the basics, well....“

Dallas’ Shared Vision also allowed it to alter the mental model of the project management role. A focus group member stated:

"...we try and deliver a first class service. As I said before like when I said about the trying to get into the Project Manager’s mind that you’re effectively especially on an existing store like a doctor on call.”

It was likely that Dallas’ leaders developed this mental model alongside the vision before implementing the strategic direction for the organization (following Santos & Garcia, 2006).

In addition, there was a strong suggestion that Dallas aligned its organizational vision to its customers’ visions. This may be easy for an organization which works predominantly in one sector, but may be more difficult for a larger contractor which covers many sectors. A focus group member offered:
“...you can see how much the industry or the sector of construction that we’re working in has affected the way we run our company and I think that’s a great strength for Dallas that we are not afraid to allow our sector to set our plan and our management systems. And I think a lot of the big national contractors try to inflict a ‘We are the mighty so and so and this is how we are’. Now go away and talk to the customers and tell them how great we are’ and we actually say ‘We’ll work with you. How should we operate to most meet your requirements?’”

However, the director of the Washington team still developed a ‘vision’ for his element of the business. This was then submitted to the board for review, critique and approval with the board having the final say as to what went into the vision for the year. This approach suggested that the vision was not entirely shared and still largely controlled at a board level and may be seen to conflict with the practice suggested by Fowles & Edwards (1999) and Senge et al (1990, 1994).

7.5.6 Kansas

Kansas’ vision was one of doing an excellent job for their customers and to use this to gain further work from referrals. It tended not to advertise and therefore such referrals were the lifeblood of the organization. In addition, it was strict about not misleading customers and this was something that the chairman developed and instilled as the business vision in his employees in order to gain those referrals. The MD stated that:

“...we’ll never ever convince a client that what he’s got is good if it’s bad. We’ll just say to him ‘Forget it. We’ll rip it down and we’ll do it again.’ So in the way, the goals for the people within the business they will see that, that’ll be demonstrated to them.”

This vision has, however, been tempered by a short term vision to survive in the recession. This issue had changed Kansas’ view on self promotion and it had started to raise its visibility in pursuit of this new vision.

7.6 Summary

Within this Shared Vision chapter, as with the previous chapters 5 and 6, the analysis again came from all six nominated contractors. Again, not all discoveries in all contractors were analyzed against all Shared Vision elements. This was again due to the differences in depth of demonstration of this LO discipline between the
contractors. It is noted in the Conclusions, Implications and Recommendations chapter 10 that no one organization demonstrated all of the elements of a LO and that the analysis herein, again similarly to chapters 5 and 6 drew together the better examples in each Shared Vision sub-section from the six contractors and contrasted them against each other and previous research.

This approach, whilst it provided what could be suggested to be a best practice example of the deployment of Shared Vision within a contracting organization, provided a idealist ‘tapestry’ which does not represent the reality for any one organization. In addition, some points brought out where there are notable failings in the six contractors to adopt LO processes which provided a contrast within the analysis. The same approach to analyzing the research was taken in the following chapter 8 which examined the Team Learning element of the LO model within the six nominated contractors.
Data Analysis and Discussion – The ‘Team Learning’ Element of the Contractor LO

8.1 Introduction

Senge et al’s (1990, 1994) position on Team Learning is that it is essential to align and develop the capabilities of the individuals within an organization if they are to work together toward a common goal. The discipline builds upon what is achieved through the employment of Shared Vision and Personal Mastery to enable employees to work together effectively.

In order to identify the presence of Team Learning, the study reported in this thesis examined the prevalence of elements suggested by Senge et al (1990, 1994) as being essential to developing the vision. These elements were the propensity of the organization for importing knowledge from without; the ability of the organization in sharing knowledge at a business level; in sharing knowledge at an individual level; having a supporting organizational structure and processes to encourage the importing and sharing of knowledge; and having a form of incentivization for individuals to share their knowledge with others.

A very important element of Senge et al’s (1990, 1994) view of the LO which appeared to be conspicuous by its absence from this thesis’ case studies was the concept of dialogue. Senge et al (1990,1994) notes that dialogue is a better form of knowledge exchange than discussion, as dialogue involves the suspension by all participants of assumptions behind their ideas to allow the group to examine these assumptions and discover greater insight. Not one of the participating organizations suggested that they used such an approach in Team Learning and that discussion, supported by advocacy of individual ideas, was the main method utilized.

The following telling quote from the Indianapolis focus group demonstrated the technique for bringing learning to a group and advocating it as the best way forward for the organization:

"...we often end up shouting over each other to get our point across..."

Such an approach was not viewed as a weakness to Team Learning by the participants. Rather, they considered the approach to be a strength because all individuals had the opportunity to bring their ideas to the table and to advocate those
ideas. The organizations did not view shouting as argument, but as a method of establishing the best ideas and learning for sharing.

Each of the elements mentioned in the second paragraph above are analyzed and discussed through the reflection of the observations within the six nominated contractors. Reflection is done not only against the back drop of Senge et al’s (1990, 1994) work, but broader work from within and without the construction industry. Whilst Team Learning as a discipline within the LO model from Senge et al’s (1990, 1994) is not challenged within this chapter, it is important for credibility and rigour to analyze and discussion the findings against the detailed, and more recent works referenced herein.

8.2 Importing knowledge from without the organization

8.2.1 Cincinnati

Simple changes within Cincinnati seemed to be being imposed, as it seemed to struggle to encourage those not in a management position to bring forward ideas. Therefore, most imported knowledge seemed to come from management and be imposed upon the organization as this quote from the focus group suggests:

"But a lot of [non management staff] don't [bring forward knowledge/ideas] and just let [middle management] do it."

It may be that Cincinnati believed it was encouraging ideas, whereas it may be acting sincerely but inadvertently killing off ideas. Koulopoulus (2010) noted methods which organizations used to inadvertently stifle innovative ideas whilst thinking they were actually encouraging them. Those methods included: Believing innovation will just 'happen'; telling everyone to 'think outside the box' then holding a brainstorming session, and then not following up; creating an 'obstacle course' for ideas; viewing 'different' and 'new' as bad; being afraid of failure; innovating only when you need to; leaving innovation up to the 'innovators'; encouraging everyone to drop any and all ideas into an electronic submission box.

8.2.2 Tennessee

Tennessee had made a concerted effort over the years to observe improvements in the way other industries work. As one of their directors noted:
“...one of the things that I did do was to look to what other industries were doing and actually found that the oil and gas industry were actually leading the way at that time.”

Such research had largely come through the efforts of Tennessee’s directors and did not, however, appear to be part of the contemporary organizational culture. The one organization who it appeared to aspire to be like was BP and it had spent considerable time looking at how BP worked and tried to copy its operational ideas and adapt them for Tennessee’s own uses. It had observed BP building oil rigs and realized how similar in principle this was to constructing buildings. The research with Tennessee was carried out before the BP Gulf of Mexico disaster and therefore further comment on this comparison is beyond the scope of this thesis.

In addition, Tennessee’s directors had tried to bring some ideas from the automotive manufacturing industry. The MD stated that:

“...we’ve had a guy from Toyota who came into the industry and started practicing as a consultant in the 1990s who brought some of the ‘Just in Time’ sort of stuff. Some of the ‘Kaizen’...”

Much had been written about the construction industry being more like the automotive industry and certainly the automotive industry had provided excellent examples of how to import learning successfully from other industries, such as Hyundai (Kim, 1998), but Tennessee had observed that not everything was realistically transferable from automotive processes. For example, Lean techniques which Jorgensen & Emmitt (2008) suggested required much translation before application in construction.

8.2.3 Indianapolis

Indianapolis also looked to the automotive industry to help it import knowledge, and by extension, learning. It looked more along the lines of collaborative buying, collaborative working, value engineering, researching different materials and how the automotive industry markets itself. Its directors suggested:

“...the car industry is a great example of where people can work together, collaborative buying. You know I’m surprised they haven’t gone further in the car industry? Collaborative actual production lines...”
This was, however, very much stated in the ‘how would that look’ stage and was clearly still embryonic thinking on Indianapolis’ part. Where Indianapolis was implementing technology from other industries was in the arena of three dimensional modelling. Whilst this model was not new to the construction industry, it was still not as widely used as in manufacturing. Indianapolis had made it a bigger part of what it did, particularly within the team that worked for Miami. These varied approaches suggest a high absorption capacity (following Kim, 1998) for imported knowledge at Indianapolis.

Further to the directors’ approach, members of the Indianapolis focus group tried to bring in ideas from construction industry press, with one focus group member stating “…there’s industry magazines and industry information…” and from consultants with whom Indianapolis worked. An example of this importation was the modular build student accommodation where it had employed the expertise of a subcontractor; it was using this knowledge to help Miami with its push towards wider utilization of modular build. In addition, Indianapolis looked to import as much knowledge from its customers as possible. It viewed this relationship, for example, as a marriage of skills between the retail mind of Miami and the construction mind of Indianapolis. It had used the skills marriage to integrate these two bodies of knowledge within its own organization and to pass the knowledge down the supply chain.

8.2.4 Chicago

Chicago’s directors pointed to the recruitment of new people as the best way of importing new knowledge into the business from outside. Chicago routinely externalized new recruits’ knowledge about the way their previous employer purchased from, and organized, its supply chain and how it controlled the business. One of the directors noted:

“…last year, we recruited quite a lot of people. And I think we learned a lot during that process as well. If nothing else we learned about how other large contractors buy things, who its - what its supply chains look like, you know what sort of control systems it tend to have…”

The recruitment process allows it periodically to review and improve its own systems. This meant that Chicago viewed an employee turnover of zero as a weakness to the business as it curtailed the ability to bring in that stream of learning. Palekar (2006) advocates recruitment as vital for importing new organizational knowledge and learning.
8.2.5 Dallas

Much of Dallas’ external knowledge acquisition appeared to be borne either out of necessity to research a construction technique or product. The other main driver tended to be customers such as Washington challenging it to adopt things that its peer group were already doing. Dallas did, however, have its own design group which was specifically in place to research such knowledge opportunities. Dallas directors noted:

“...[Dallas design group] imports certain things into the Washington team because one of our engineers will say "Oh actually we’ve been trialling this, we do this sort of thing. Have you ever thought about using it on such and such?"

What was not clear was how proactive Dallas’ design group was in terms of whether it actively seeks new knowledge unilaterally or reacts to internal knowledge requests. Such an assessment of the proactive-reactive knowledge acquisition position adopted by different organizations was conducted by Saka-Helmhout (2007) who suggested that it was the action of actors rather than the organizational structure which determines the acquisition of new learning. Therefore, it may be that Dallas had a particularly proactive head of design group.

In addition, Dallas’ management procedures were developed by importing some of its customers’ procedures. Such importation aided alignment between Dallas and its customers and highlighted that it was willing to learn and develop its business through learning. An example given was Washington’s ‘RAGB’ system, which the Dallas MD was even using on a personal level during a house extension project:

"...there’s a snagging list to be resolved and I’ve filled it in red, amber, green and blue."

Importing actual business operation processes directly from customers appears a novel departure from current writings about value stream alignment (c/f Adamides et al, 2008) or the alignment of IT to reduce inventory in the supply chain (c/f Piplani & Fu, 2005).

Perhaps Dallas’ best source of learning could be attributed to its undercover work, as noted by one of the directors:
"...we have an unmarked van that can sometimes go on to someone else’s site, have a little look around if I’m particularly interested in something...”

Whether this could be noted as a questionable source of learning is a moot point; it did not appear to quite come under the heading of industrial espionage (c/f Samli & Jacobs, 2003). Another useful source of learning appeared to be its strategic hiring, which was similar in approach to that of Chicago when discussed with the directors, one commented:

"...I do sit down and consider people’s backgrounds and think "Ah I haven’t had a [contractor] man for a long time. I wonder what [contractors] are up to these days?"

Dallas’ risk management policy was learned from the petrochemicals industry. The reasoning was that without an excellent risk management policy, the petrochemicals industry would kill people and therefore Dallas’ directors decided to import its risk philosophy, with one director commenting: "...when they have a bad day they blow people up so its risk management provides a very important function...” which it has adapted for construction industry use.

8.2.6 Kansas

Kansas imported some new joinery knowledge through the hiring of a key individual and in the view of the directors this had been successful in the development of its joinery business. One director commented:

"...he brought in these new flat pack grommets and key clamps and god knows what. And, well first of all I said ‘God, [name] you know we’re a traditional joinery company, we’re not going to be messing about with that crap.’ But it’s actually fantastic stuff...”

In addition, Kansas simply viewed what other contractors were doing when it worked alongside those contractors on site. Furthermore, there was formal knowledge exchange that occurred in the contractors’ forum run by Oakland set for the specific purpose of allowing contractors to learn from one another. Another forum set up with other contractors was the ‘Toolbox Talk’, which was a talk to transfer expert knowledge about a specialist area, which Kansas asked its subcontractors to do when these subcontractors were carrying out a specialist service. Toolbox talks were noted by Cameron & Duff (2007) as a key learning element in the construction industry.
8.3 Sharing knowledge at a business level

8.3.1 Cincinnati

One of Cincinnati’s parent companies ensured that there was representation from various sectors within a centralized team to ensure that learning was pulled together from the various sectors. Cincinnati’s leader advised:

“...they are the centralized area which covers nuclear power, water, oil and gas and process within the same building. They’re pulling in the learning from all of them.”

Actively encouraging project discussions at this business level had provided individuals with ideas for technology that could be moved between sectors. Cincinnati had found that this was the best way of getting improvement in ideas over and above the individuals who may have been in one particular industry for twenty years. The centralized team then acted as consultant to the various sectors and Cincinnati’s leaders were expected to liaise with it to find out what new developments there were in the world and how they might be imported into its current service stream. It is interesting to note that Ribiero (2009) recommended the use of key knowledge teams for improving KM in construction organizations.

The centralized team also set knowledge exchange visits with a key learning purpose, such as a team from Cincinnati visiting one of another sector’s key projects to view how it was handling waste management, which included their leader, who commented:

“...they’ve been dealing with waste for fifty years at Sellafield. Granted, it’s radio-active. But if there’s anything we can pick up [we will].”

In addition, the central group issued information and ideas and visited service delivery points to exchange knowledge and help with ideas generation. Cincinnati extended this service to Pittsburgh by inviting it to attend knowledge exchange sessions. These sessions spawned ideas about how what was happening on one customer service stream can be augmented into another.

Cincinnati’s parent companies have offices in other European countries, which allowed it to glean learning from further afield and examine how things were being delivered within completely different cultures. Cincinnati’s leader was particularly impressed
with the different ways of thinking about problems which were demonstrated by these different cultures and vice versa. He stated:

"...you get invited to these cross-network things, so I'll go to [country] and I'll meet people from [construction industry sector] in [country]. Those things are quite good for, for learning..."

This type of learning might be the most valuable to Cincinnati as it allowed individuals to change their viewpoint on an issue and thereby come up with an improved solution compared to what it might have with 'accepted' thinking. It was clear from the way these inter-country knowledge exchanges were talked about that it was seen as an exciting source of thinking to the Cincinnati team. The team’s enthusiasm suggested an excellent alignment with the multi-cultural JV learning environment described by Berrell et al (2002).

In fact, Cincinnati had been noted by its parent companies as having some good learning which can be taken on board by its wider businesses. This approach was considered to be a good demonstrator of knowledge exchange between a JV and its parent companies. Such exchanges were meant to be one of the competitive advantages of entering into a JV in the first place. The focus group members felt that Cincinnati had been able to bring more learning to the table comparatively than other programmes of works run by its parent companies.

Cincinnati tried to ensure that knowledge was disseminated from its design review process. This was a gateway process whereby designs were reviewed before approval. This system, however, did fall down at the recirculation stage where some lessons had taken two years to circulate. A member of the focus group advised:

"...some of those lessons learned won't get published until two years after they've been learned, which is an issue."

Cincinnati had found that the best way to overcome this problem was to have continuity of personnel and to ensure that they talked frequently. This failure did, however, suggest an underlying process problem. Gyampoh-Vidogah et al (2003) suggested that slow knowledge circulation in construction organizations was an IT and systems problem, which may be the case in Cincinnati as it was using a people solution to solve the issue.
Cincinnati had initiated the use of document controllers who acted as collators of information as that information arrived into the organization. Thus, when any information was needed, it was easy to approach the controllers with a request and obtain it. There was no such system before and some other contractors working for Pittsburgh still stored information on computer drives. The focus group was clear on their value to knowledge sharing, with one member commenting:

"...in six months time, I go to the doc controller and say "What came in from these people?" They'd give me a print out and show me and that's it."

The use of document controllers was an example of a relatively simple change which had improved knowledge retention and availability. This change, however, did still require some explaining as to the benefits when it was proposed to Pittsburgh and the other contractors in Pittsburgh’s alliance.

8.3.2 Tennessee

Tennessee acknowledged that the default position for individuals within its organization was not one of wishing to share knowledge. Tennessee’s MD asserted:

"...we need to get employees actually motivated to want to share the knowledge. And it has to be said that is not the default position..."

What Tennessee tried to encourage was a culture of individuals understanding that they were part of something larger than simply the particular office in which they worked. Tennessee’s position and solution was in alignment with De Long & Fahey (2000) who noted the cultural aspect required to align individual knowledge with the organization.

Tennessee continuously looked into ways to motivate employees to make such wider knowledge exchange happen. It had started by ensuring that the central core of the company actively shared knowledge and that this approach was clear to other departments. This ‘lead’ was designed to start the other departments towards seeing the benefits and changing their cultures to follow suit. Such an approach suggested that culture change cannot be enforced; it can only occur through organizations, or in this case departments, wishing to change themselves and doing so voluntarily (following De Long & Fahey, 2000).
8.3.3 Indianapolis

Indianapolis was prepared to share certain ideas with other organizations which might normally be regarded as its competitors. Indianapolis’ team leader for the Miami commission postulated:

"...we as an organization, we don't have a problem with people giving competitors our idea."

This sharing was particularly the case in the environment with Miami where it was expected that suppliers collaborate with ideas in order to improve the performance of the whole. Indianapolis, however, did make the point that there were some business sensitive ideas which the organization invested in and developed that it was naturally not willing to share. From its own perspective, Indianapolis tried to view the many ideas it generated in a Miami environment as ideas for the Miami contractors’ forum rather than for itself. Such knowledge exchange was viewed as a cultural approach within Indianapolis which helped set it apart from its peer group. Kumar & Thondikulam (2006) noted that exchanging knowledge with ‘trading partners’ who in another arena might be competitors was a source of competitive advantage.

Indianapolis did seem to understand the power of sharing its ideas at an organizational level in terms of making things better for all within the organization. It pointed to its close knit customer orientated teams as being the best way to encourage knowledge sharing at this level. It had ‘communication days’ which doubled as team building events. The directors noted:

"...we are trying to do a bit more of the, like the relaxed informal day that we are having on Friday...."

The members of the focus group agreed that these were successful forums at which knowledge was shared across the business, with one commenting:

"...that was quite a successful day that we had earlier on in the year...."

Chua (2002) noted the particular usefulness of social interaction for knowledge creation and exchange within an organizational setting.

In addition, Indianapolis held regular open forums and workshops to enable all team members to bring ideas back from their various sites to distribute them amongst the team. The idea here was to give people opportunities to contribute problems and
opportunities in small incremental sessions rather than try to bring all their learning from a particular site in one go. The other intention of these forums was to maintain the team spirit.

The focus group admitted that trying to keep teams of 200 communicating and working as a team was difficult and described communication as:

“...email based and obviously we talk to each other on the phones and stuff and you know, [Miami team leader] gets round and visits people and spends a lot of time out on the sites and stuff. But it is quite hard because you are so split up …”

Keeping a team of 30 working as a unit was easier, so this was why Indianapolis concentrated learning and communication on this customer team level in order to support the whole. Roberts (2000), however, questions the ability of ICT supported knowledge exchange to replace human interaction adequately, particularly for tacit knowledge exchange. This dichotomy suggested that Indianapolis was not as efficient at knowledge exchange as it believed.

In addition, Indianapolis did have an accepted ‘reflection’ time within the year. There was a four month period, usually during the winter, where its workload was lower than the rest of the year (due to its heavy retail based focus). It used this time to think about how it had performed and how it could perform better when the work picked back up. Goddard (2001) noted the importance of reflection time within the organization for improving performance. Indianapolis directors clarified its approach, with one stating:

"...we do all the systems, all the things that we should be doing. Think about the jobs, how we've done, how we're doing better, so it's a real sort of time for reflection..."

Clearly knowledge exchange during busy periods was very difficult for Indianapolis and reflection time was an important tool.

8.3.4 Chicago

For its Minnesota works, Chicago had a handbook which set out the service provision, how to deal with any landlord issues, the Minnesota team and the supply chain. The directors stated:
“...we have put together a handbook, and it basically sets out what is expected of us by Minnesota...”

Further, the handbook set out the process from Minnesota’s inception of the project to the end of the warranty support period. Minnesota assisted in the development of this handbook, suggesting a good alignment with customer needs. In addition, Chicago had the occasional ‘learn and share’ sessions to which it invited all its project managers to carry out a post mortem on key projects.

8.3.5 Dallas

Dallas regularly attended learning sessions set up by Washington where it presented to its peer group and viewed presentations from its peer group, again aligning with Kumar & Thondikulam (2006). These presentations were on a specific area of learning which each organization had discovered and considered of interest to the group. In addition, Dallas suggested that due to its size and diversity of skills, it finds it relatively easy to pool resources when looking for solutions. However, in knowledge exchange, Dallas admitted to being more reactive than proactive.

Dallas made the point that as much of its knowledge was made explicit as possible as if knowledge was only held tacitly then this led to problems on projects. Dallas MD advised:

"...explicit is very very important to us. ...the management team on a building site need to have very explicit direction and they need to then be very good at communicating that explicit information in a very explicit manner, because we end up with the wrong product at the end of the day if we don’t do that. So, to a degree, we try very very hard to not have any tacit knowledge because that leads to an uncertain outcome and that can be very dangerous to us."

Stenmark (2001) noted the wider problems organizations encounter with leveraging tacit knowledge, such as lack of awareness and unwillingness for the individual to share.

The focus group was less aware of these knowledge exchange processes. Some participants stated that the recent drop off in Washington work had given some of the team the opportunity to learn about the different processes used in working with Dallas’ different customers. The focus group concentrated more upon the individual
knowledge exchange within the Washington delivery team which was based upon a mentoring system. In addition, it discussed the twice yearly ‘knowledge exchange’ day and e-mails from the directors as the main sources of organizational knowledge exchange. One member commented:

“...you will get some sort of communication because every month we have an internal review meeting where [the directors] will come down and review every aspect of the job...”

The difference in opinion on learning between the management and the focus group suggested a disconnect between what Dallas management intended to happen on the learning front and what actually occurred within the organization, which should not occur in an LO (Senge et al; 1990, 1994).

8.3.6 Kansas

Kansas used a similarly informal knowledge exchange system to Dallas with the directors meeting on a Monday morning to carry out knowledge exchange and then the learning was disseminated though each director’s team. Moreover, there was a quarterly newsletter circulated which informed the group about what was happening around the group. It was unclear whether there was any true knowledge which can improve business performance exchanged through these two routes or whether it was simply news and information being exchanged.

At a site level, there did appear to be knowledge exchange which happens when the site foremen come together, as noted by the focus group:

“They have weekly meetings between the Site Foremen that are there or the Contracts Managers. To see if there’s anything on each of the individual projects that might be able to help the other person when they come to do something similar.”

In addition, at the end of each construction project, each foreman offered up unused materials to the others to avoid unnecessary transport back to stores and then those materials potentially remaining unclaimed for months. Formal knowledge exchange was, however, not seen as overly necessary on the Oakland commission due to the repetitive nature of the work. Gieskes & Broeke (2000) noted that learning is more difficult in a non-repetitive climate and therefore Kansas’ position may not be viewed
as complacency, but simply that it felt knowledge exchange was part of the day-to-day role.

8.4  Sharing knowledge at an individual level

8.4.1  Cincinnati

Cincinnati set up team briefs and brunches to allow learning to take place informally. This was particularly done where there had been a health and safety incident to ensure that the individuals involved shared the experience with others. Furthermore, Cincinnati’s team leader actively introduced different individuals with different experiences to these brunches and encouraged them to discuss what they were doing and if their knowledge might be of benefit to another project. This approach aligned with Chua’s (2002) position of utilizing the social backdrop to allow knowledge exchange.

8.4.2  Tennessee

Tennessee ensured that learning was captured and shared between individuals working on the same customer account through having a ‘core team’ which managed the knowledge. This helped when customers required Tennessee to work from various locations throughout the country providing largely the same product. The core team helped to ensure that the project delivery teams: “...certainly [only make] one mistake and not fifty [identical] mistakes...”, said Tennessee’s MD.

Tennessee accepted that its employees related more easily to small groups of individuals than they do to the organization as a whole, a position supported by much research (Restubog et al, 2008; Sheard & Kakabadse, 2002). This tenuous relationship, the directors felt, was something alleviated through the use of an innovative organizational structure, with one director commenting:

...the strength of having local businesses that are actually focused on the local clientele and relate to the needs of the customers in that particular region. But, they all actually mirror each other in what they do, in that the processes are the same. And through an overlay, which we call 'National Business', we actually have a mechanism to make sure that people are actually all pulling on the same end of the rope and getting information across from A to B.
Therefore, Tennessee has encouraged the more small scale relationships to enable individuals to share more readily and then used business process to take the knowledge further around the organization. In addition, Tennessee actively encouraged particular individuals with key knowledge to share on a specific and targeted basis. An example of this was two healthcare experts in different parts of the country coming together to exchange best practice and thereby increase both experts’ knowledge.

8.4.3 Indianapolis

Indianapolis had struggled in getting people to engage with each other and exchange knowledge. It did appreciate that it had good people, but it had yet to motivate them to exchange ideas. It is questionable, however, as to whether individual knowledge exchanges should be ‘push’ motivated or whether the culture should be such that it enables it (Senge et al, 1990, 1994). The Indianapolis focus group noted that the organization had put in place a flat structure and tried to encourage the exchange of knowledge through embedding it within the culture. It may be that the lack of success was down to a lack of supporting processes. A member of the focus group commented:

“...I can't think of a formal process that we've got that we sit down and share things...but really it's more a case of, we do it in team meetings, we do it in project reviews...”

Informally, Indianapolis’ project managers continued to communicate ideas to each other throughout the year and the MD regularly attended sites to help with knowledge exchange. Such attendance allowed an informal channel for knowledge to flow from project site to project site despite the site teams themselves changing slightly for each new project. Indianapolis tried to keep a mixture of maintaining an existing team from one project for the next one whilst rotating some individuals to help employees gain varied experience.

8.4.4 Chicago

Most of Chicago’s exchange of knowledge outside of the Minnesota commission was carried out on an informal basis through business communication. The directors did try to facilitate this exchange by pointing individuals in the direction of people within the organization who may have knowledge that might be of use in a particular
situation. One director suggested that Chicago’s entirely open plan office assists with communication, stating:

"I know it’s not perfect by any means but you know it’s also part of being in an open plan office. I don’t have an office. I think there’s so much that you sort of latch onto just because you overhear someone talking about it."

The open plan office as a facilitator or communication exchange appeared completely consistent with Ding (2008) who suggested that managers took this view although employees took the view that open plan offices were too noisy.

In addition, Chicago noted that the consistency of the team, particularly the Minnesota delivery team, was an advantage to easier knowledge exchange. The constant communication and the fact that individuals know each other and each other’s experience, skills and current workload were the enablers mentioned. It was interesting that Chicago’s focus group viewed a low team turnover as an advantage, with one member commenting:

"...it’s really helpful having that consistent team working on it and not constantly swapping people around...."

By contrast, its directors viewed it as a potential weakness to getting new knowledge into the business. It appeared that an ‘ideal’ turnover level was required to achieve both ends satisfactorily, as discussed by Siebert & Zubanov (2009).

### 8.4.5 Dallas

Dallas suggested individual knowledge exchange was so inherent in the business that it did not need to be actively encouraged, enabled or managed by the business itself. It was suggested that the passion for the business, the customer and the customer’s stakeholders felt by Dallas’ employees meant that they were all willing to share knowledge and ideas. Furthermore, Dallas’ directors suggested that it did not want to impose a formal knowledge exchange structure upon what it viewed as being its creative people for fear of stifling the knowledge exchange which already takes place. One director stated:

"...we don’t have, deliberately don’t have a huge amount of process. We are very nervous of process. We think it stifles personal ability."
Although no evidence was offered as to why Dallas thought that to be the case, it was similar to a position held by Pech (2001).

In addition, Dallas brought in individual experts when necessary to replenish the business knowledge capacity where customer needs demanded it. Dallas’ team leader for the Washington commission confided:

“I know [name] at [Dallas subsidiary organization] is an expert on glazing and he knows us all, we all know each other and we trust each other.”

Dallas’ approach suggested a willingness to collaborate with related organizations in order to widen or deepen the service offering to the customer. In addition, Dallas had recently hired a modular construction expert to roll out this expertise to the rest of the business.

### 8.4.6 Kansas

Kansas was another organization with a very open culture where anyone could talk with anyone else, which aided knowledge exchange. The directors sometimes walked the site and asked individuals to: "...show us what they’ve done. Explain to us what they’re working on.” A ‘go and see’ approach (Womack & Jones, 2005) helped the directors understand where activities could be done better and reminded directors that managing the organization can not just be about sitting in the office watching the bottom line.

### 8.5 Supporting organizational structure & processes

#### 8.5.1 Cincinnati

Within all of the organizations examined for the research reported in this thesis, there was a structure which, it was suggested, supported the creation of Team Learning. Cincinnati felt that its position as a JV allowed it to bring learning and perspectives from two separate parent organizations which was seen to be advantageous over its singular entity peer group, in line with Inkpen & Currall (2004). Inkpen & Currall found that learning processes are central to alliance development dynamics. Cincinnati’s leader noted the distinction between the two parent organizations and how the two perspectives worked so well:
“The [parent organization] side of things, which is heavily biased towards the engineering. And the [parent organization] side, which is more the construction [side]”

Having two diverse parents allowed it to pool viewpoints on problems from both sides.

Cincinnati had found this situation particularly useful in developing its leaders’ perspectives on engineering, construction and project management. In addition, Cincinnati was being increasingly proactive in getting structure in place before changes in workload with its customer which improved its reaction ability. It accepted that there were disadvantages to be managed in the form of allocating individuals to roles. Where it might be simpler in an individual organization, there was the issue of trying to achieve the correct management and reporting lines when dealing with individuals from two different parent organizations, as noted by Beamish & Lupton (2009).

In addition, Cincinnati felt that its parent companies’ approach of housing centralized teams in the same locations further supported Team Learning. One of its parent companies operated. Cincinnati’s leader advised:

“...the EFQM model which is the European Foundation Quality Management, or something like that, which includes Continuous Improvement.”

which fed into Cincinnati’s learning processes. Cincinnati had an improvement team which visited the sites specifically in order to transfer improvement ideas. The tool used by the team was a simple improvement log which it maintained and distributed accordingly.

At a project level, those who delivered Cincinnati’s projects were made to go through the lessons learned from other projects before they started a new one. This approach to learning suggested that there was not yet the culture to ensure that they carried out lessons learned voluntarily; nor was it obvious how Cincinnati used those lessons learned to improve the next project. A member of the focus group stated:

“...we’re trying to put things in place where you have to go through the lessons learned from previous jobs to get to do a job.”
Although the focus group stated that the process was not perhaps as successful as it might be, with one member commenting:

"...we have formal lessons learned things, but in real truth it comes down to somebody saying "That’s not the best way to do it."

These quotes suggested that best practice models such as those presented by Jeon (2009), which included a model for knowledge acquisition, storing, evaluation and dissemination, had not infiltrated Cincinnati’s processes.

8.5.2 Tennessee

Tennessee’s MD stated that its uniqueness was that it structured itself so that it operated on a national and regional basis. It achieved this through ‘...complete self-contained units to some fair extent...’ which allowed Tennessee to interact with its local customer base on a more personal basis. It also enabled regional offices to refer back to the national business when needed in terms of interaction with larger customers or reliance on central services.

Tennessee’s setup helped it to avoid doubling up efforts in terms of project and customer bids. Each regional office bid only in its own region, but national clients were managed by a central champion. The structure could therefore be described as a conglomerate of regional businesses with a strong overlay which stitched it all together. Tennessee suggested that each unit traded almost as an independent organization which motivated learning at the business unit level.

BS5750 was the catalyst for Tennessee to create the best practice processes that supported its Team Learning. BS5750 was a quality standard applied to business processes under which Tennessee would have set quality targets and monitored performance against target. It was once acknowledged as the construction industry standard in the UK but was now almost entirely superseded by ISO 9000, the international equivalent (Moatazed-Keivani et al, 1999).

Tennessee postulated that, unlike other organizations, it looked to the BS5750 standard to help improve its organization rather than just to obtain a plaque on the wall and a logo on its documents. One of the directors noted:

"We very much decided that we would not do it to get a badge on the wall. We would do it as a business improvement exercise and that is what we did."
Tennessee felt that the best way to use this would be to attempt to align its processes to the best practice principles of those of the manufacturing industry. It made the clear distinction of not aligning exactly with the manufacturing industry’s processes themselves as it suggested that such processes do not translate exactly to construction. Manufacturing was viewed simply as a source of learning.

Tennessee took a similar approach when achieving ISO14001 and ISO18001 which are European environmental and safety standards respectively. It combined these in a way that supported the business so that it learned to examine both factors when planning ways of working on site. This approach had spawned an integrated management system which was industry recognized, as one of their directors noted:

"...we were actually the first company in the country – construction company in the country – to gain registration from BSI for an integrated management system...“

Tennessee opined that this was a huge driving force around which its organization had grown.

Tennessee used its integrated management system to help apply all business improvements in a common way. Such application had been a fundamental part of the business culture – the understanding and acceptance that improvement is sought and then applied in a consistent manner across the entire business. Tennessee’s MD asserted

"...when there is an improvement identified, you can apply that improvement very easily across the whole company in all it’s geographic parts because you’re always moving from the same common base...“

Tennessee genuinely believed that the system made it one of the best practiced contractors in the industry. Zeng et al (2005) set out the benefits of implementing such an integrated system as “avoidance duplication of procedures”, “reduced conflict of procedures”, and “reduced requirements for resources”.

IT support was another key to Tennessee’s process support to learning. It felt that its use of Lotus Notes over the Microsoft system enabled it to be more intelligent in its collection, management and distribution of soft knowledge. One of the directors stated:
"...what I would describe as 'soft knowledge' more than the hard knowledge is actually in Lotus Notes, in databases. And the advantage of that is that Lotus Notes databases replicate in all the servers around the country and can replicate on to your own C drive...."

Due to its replication, manipulation and retrieval, Tennessee felt the system took care of the 'mechanics' side of Team Learning. It allowed people to access information about a customer project in another part of the country to utilize on their projects. The ability to simply demonstrate a high sophistication of internal knowledge management by talking knowledgeably with a customer about projects in other regions was seen as a key benefit of the system.

### 8.5.3 Indianapolis

Indianapolis had divided itself up into customer service streams, but beyond that it prided itself in having little formal structure or processes. It was able to do this successfully because it was a small enough organization to still be contained completely within only two offices across the UK. It suggested that these streams' close knitted makeup and its open forum meetings aided communication and the exchange of knowledge. Indianapolis director for the Miami commission revealed:

"...we have a team working for Miami, a team working for [another customer]. So again you generate that; you've got to generate that to familiarity. So even with the director, they're always working for the same people and they tend to be very close knit sort of teams..."

In addition, Indianapolis suggested that it had made its structure as flat as possible to enable communication, an approach which was seen to be in line with Claver-Cortes et al (2007). Indianapolis was entirely owned by its directors and as soon as someone was promoted to director, they became part of the ownership structure. The feeling was that this aspirational driver had helped retain key staff with knowledge within the business. How this reflected against flat structure potentially causing a demotivational effect of slow career progress was not discussed.

One interesting comment from Indianapolis’s MD was that the ‘all directors own a share of the business’ model was developed when the business was worth nothing. He questioned whether the business founders would have decided on the same model if the business had already been the size it was now. This finding raises a philosophical point about the commitment to the ideal LO structure over personal
gain, which was seen to be a key omission from Senge et al’s (1990, 1994) model. It remains an interesting question, the answer for which is beyond the scope of this thesis. This ownership model did, in Indianapolis’ opinion, give it a perceived advantage of not being ‘faceless’ as opposed to those contractors owned by remote shareholders.

The flat organizational structure which Indianapolis had actually came about due to the removal of almost an entire tier of middle management during the recession. This was the same process by which many other organizations had achieved such a structure (Claver-Cortes et al, 2007). One of the directors pointed out:

“The middle manager is gone, the people that [were] looking over people that are doing.”

The feeling in Indianapolis was that the removal of this layer would actually improve the business as it was stifling ideas, ambition and empowerment. Indianapolis’ directors had put out the message that this was an opportunity for those who were once below this level to develop their careers. There may be the ironic observation that the opportunity for promotion into a level which had previously been made redundant and that therefore such opportunities may not be motivators. This was not explored during the case study research.

Supporting the Indianapolis business further was its intranet system, ‘Word Up’, which was designed to allow employees to exchange knowledge, post good ideas and to celebrate success. This system was necessary due to the largely site based nature of its workforce and the fact that it encouraged ideas from those who were executing the physical works on site. Members of the focus group were trying to raise the quality and quantity of ideas and feedback through having a “…subject for the week…” which individuals were encouraged to feed back on. In addition, sending idea updates and organizational news assisted Indianapolis in keeping those remote from the office in touch. Jeon (2009) noted the necessity of a well programmed intranet system for enabling knowledge exchange.

8.5.4 Chicago

Chicago’s support was provided through its open plan office setup which it suggested improved informal communication. Given that informal communication was its primary source of knowledge exchange, this setup was seen to be a key element.
Chicago enjoyed the similar ‘flat’ structure seen at Indianapolis (Claver-Cortes et al, 2007). In terms of systems support, one of the directors noted that Chicago had a

"...large relational database that tracks every single project and every single person that’s involved with every single project, both inside and outside the organization...”

The database can be used to establish where knowledge was held within the business. Whether it was used proactively to exchange knowledge was, however, not assessed. All knowledge that was disseminated onto its intranet went through a working group and then the directors to ensure accuracy and relevance.

In addition, Chicago’s intranet database could list each person by what formal training they had received and by the projects on which they had worked. This database would theoretically allow the business to select exactly the right person for a project (Jeon, 2009). In reality, such an outcome rarely happened as the mobilization process tended to dictate taking the next available person for the next upcoming project.

Where the database system was very useful was during team meetings when project information could be called up instantly and live. The system sped up these meetings and knowledge exchange during their duration – the focus group suggested that the system had made a real improvement to how Chicago operated per se, with one focus group member commenting:

"...we go through that regularly in our regular sort of team meetings and that has a log of basically every job that you know are coming up - the sort of pre-site, then sales, on-site, what’s been finished - and just having a chat round the table you can learn a few lessons...”

In addition, there was an organizational newsletter which was distributed on this system for further information flow (following Jeon, 2009).

Chicago’s current structure had grown out of its culture, although this had not always been the case. In its infancy, Chicago was a hierarchically structured organization. This culture was described variously by participants as "...friendly...” and "...inclusive...” in terms of internal culture and "...non-contractual...” in terms of customer relationships. New individuals to the organization tended to be hired to fit in
with this culture rather than solely on technical skills. Jashapara (2003) noted the requirement for a supportive culture to enable the shift to being a LO.

Additionally, the focus group members talked at length about anyone within Chicago being able to talk to anyone else regardless of title. In addition, the social scene at Chicago was enthusiastically embraced by all employees. This scene in itself was considered to help build the culture and promote communication. A member of the focus group commented:

“...you have got formal structure to the business and formal organization to the business but you know it blends really well into the informal sort of situation as well...”

8.5.5 Dallas

Dallas’ structure did not appear at first discussion with the directors to be truly supportive of free knowledge exchange. One of the directors revealed:

“...we’re quite hierarchical from that construction level down but we believe that you have to be and that is how you run a tight ship and a construction project. That’s how you achieve your quality and your times through very clear rule definition...”

Dallas also suggested that its structure was relatively flat which enabled an easy flow of information from top to bottom and vice versa. Dallas suggested that its approach was different from other organizations as employees still have relative access to the decision makers which was not the case in more deeply layered organizations. Dallas’ hierarchical approach appeared to work for them, but such an approach has been specifically noted as a barrier to learning (Matzdorf et al, 1999).

In terms of processes, again Dallas was relatively informal. Key knowledge and learning was generally circulated, with Dallas’ director for the Washington commission advising that:

“...most of the time because of the way we work with Washington everything’s sent by email. So people would get a document, a brochure or something sent through via email...”

What was not clear was how the retention and utilization of that knowledge was measured, evidenced and managed, as e-mail can be a ‘fire and forget’ method of
distributing knowledge. Kane & Alavi (2007) noted that e-mail is best used for the unstructured exchange of tacit knowledge. Dallas did have a huge process manual, but most participants confessed that they could not recall the last time they looked at it. The written processes were viewed as more use as guidance for new employees rather than processes to follow in project delivery.

The main process mentioned by Dallas for supporting knowledge exchange was the risk process. This, it was suggested, was the best supporting process to enable employees to learn about what needs to be managed closely on a construction project. One of the directors noted:

“…taking implied tacit knowledge and making it into explicit knowledge the risk register is a very good way of giving someone a good signpost at the start of their part in a process as to where the rest of the people were involved prior…”

Dallas’ supporting standard risk meeting agendas ensured that risks were not forgotten during the management and delivery process. Risk was the only arena where individual project managers did not have the autonomy to depart from prescribed procedure. Dallas’ use of the risk register for learning appeared unique and was a clear departure from current LO literature, none of which already referenced herein appeared to mention such an approach.

Something that Dallas’ directors had promoted was a lack of meeting minutes, with one director stating:

“[We] try never to keep Minutes anymore. Minutes are cumbersome, wastes time we just have next steps. We just come up with an action plan following the meeting with people allocated with the next steps…”

This meant that only issues which required action came from meetings rather than all items discussed. The lack of minutes was, however, inconsistently applied, as Dallas operated a monthly review which was meant to pick up all issues on sites for discussion. However, this had become an obsolete process as issues tended to be dealt with long before they reached the meeting date. This process appeared to be obsolete and of little value, but appeared still to be operated. The absence of obsolete meetings is a central tenet of the LO (Senge et al; 1990, 1994) in that Senge et al suggests they ought to be reviewed, challenged and minimized.
Additionally, there was a regular, informal staff meeting which Dallas had instigated which the director responsible for each customer account attended. This meeting allowed anyone to raise any issues which the directors needed to action. The meeting was seen as important as it removed the opportunity for individuals to say they did not have a chance to speak to their director about an issue. The necessity of such a meeting suggested Dallas did not have a culture where individuals spoke to their directors as a matter of course.

The main specific learning exchange meeting at Dallas was usually held in December when there was little work happening in the retail sector due to Christmas trade. A member of the focus group noted:

“…Christmas it is a quieter period for us. That’s when we tend to have a meeting which is about the most formal sort of meeting we get to. All set out, and the whole team comes round and we’ll have an agenda just to go through and basically pick up what learning we’ve had throughout the year…”

It was at this meeting where individuals got to use storytelling as a way to describe situations they came up against, how they handled the situation, the outcome and what they learned from it. The storytelling process allowed learning and experience to be most widely disseminated across the business. The weakness noted for this process was that it did only happen once a year and that this might not necessarily be sufficient to disseminate the learning around the business effectively. Tyler (2006) noted that storytelling was becoming increasingly used in commercial organizations.

### 8.6 Incentivization

#### 8.6.1 Cincinnati

Further to the above issues, there was the incentivization provided to individuals to share learning. This can be seen as the ‘push’ motivation to go along with the ‘pull’ motivation provided by the business processes and culture discussed earlier in this chapter (following Hartmann, 2006). Cincinnati provided a tangible reward in the form of gift vouchers or leisure items for excellent ideas. The Cincinnati leader was proud enough to mention his:

“...I think I’ve got one this month. I’ve got fifty quid Marks & Spencer’s vouchers coming my way, I think.”
In addition, there was the more intangible reward of having the idea announced on the front page of both of Cincinnati’s parent company intranets. This acknowledgement rewarded not only the individual through the recognition, but further promoted the submission of ideas with others who could see the rewards conspicuously displayed (following Hartmann, 2006). This approach was supported by senior management who encouraged their teams to submit ideas no matter how implausible they may seem at first. The ideas may not seem implausible to those who read them and could potentially spark further ideas within the organization.

In addition, Cincinnati had incentivization at a business level. It had a performance business improvement plan for each upcoming year from one of its parent companies. According to their leader, there had been an environmental focus within this plan:

“...we’ve been tasked with reducing energy consumption by eight per cent. And, a lot of it, quite a lot of [business incentivization] is in energy at the moment. Quite a lot of focus on sustainability and energy...”

Energy reduction incentivization publicized a certain area of the business where the organization was looking to drive improvement and therefore particularly required employee ideas. Cincinnati had looked at energy consumption in particular because concrete, a key element in the construction of the type of projects with which it typically dealt, was a poor performer in carbon footprint terms.

8.6.2 Indianapolis

Indianapolis had not historically incentivized its team to bring ideas to the table and share per se. Its approach was that the incentive was intrinsically that all should share knowledge in order to make their day jobs that bit easier. Since it had upgraded its intranet recently though, it had tied this in with a small incentive to bring ideas to the discussion forum (as suggested by Hartmann, 2006). The reward was £100 and was celebrated on its ‘Word Up’ intranet system. As one of the directors noted:

“...we call them ‘pin up of the week’. It’s just a bit of fun but it shows you know, it helps other people think “okay, I could have thought of that.”
The ‘pin up’ process had literally just started at the time of the case study work undertaken for this thesis and so it was still not clear whether this approach was a success.

### 8.6.3 Kansas

Kansas ran a ‘Pride’ award monthly for the best ideas brought to the directors from within the organization. The financial award was small as Kansas felt that the kudos of receiving the award was more important to the individual. The reason that the financial reward was small comes from the chairman. As the MD noted:

”...[the chairman’s] theory is that "I pay you to do a job properly so why do I want to pay you a bonus on top for?" It’s a bit... But it’s a bit old school, do you know what I mean? But I can see where he’s coming from....”

### 8.7 Summary

Within this Team Learning chapter, as with the previous chapters 5, 6 and 7 the analysis again came from all six nominated contractors. Again, not all discoveries in all contractors were analyzed against all Team Learning elements. This was again due to the differences in depth of demonstration of this LO discipline between the contractors. It is noted in the Conclusions, Implications and Recommendations chapter 10 that no one organization demonstrated all of the elements of a LO and that the analysis herein, again similarly to chapters 5, 6 and 7 drew together the better examples in each Team Learning sub-section from the six contractors and contrasted them against each other and previous research.

This approach, whilst it provided what could be suggested to be a best practice example of the deployment of Team Learning within a contracting organization, provided a idealist ‘tapestry’ which does not represent the reality for any one organization. In addition, some points brought out where there are notable failings in the six contractors to adopt LO processes which provided a contrast within the analysis. The same approach to analyzing the research was taken in the following chapter 9 which examined the Team Learning element of the LO model within the six nominated contractors.
9 Data Analysis and Discussion – The ‘Systems Thinking’ Element of the Contractor LO

9.1 Introduction

Senge et al’s (1990, 1994) LO model noted Systems Thinking as the broadest discipline which acts as a cornerstone for the other four, bringing the concept of the LO together as a coherent model. The basic premise of Systems Thinking is that the organization has to understand that its mechanisms are a complex and dynamic set of systems to which simple ‘fixes’ cannot be applied. Senge et al (1990, 1994) further suggests that many organizations do not fully understand the implications of their actions in that cause and effect are often assumed to be adjacent in time and space, but are not. Understanding the wider systems and how these systems react following a change is seen to be of paramount importance in the LO.

In order to assess the presence of Systems Thinking, the research reported in this thesis looked for the contracting organizations’ ability against seven factors considered to be important for systems thinking. First is the ability to align individual roles. Second is the need to ensure co-ordination of processes within the organization to decrease the risk of internal systems working against each other. Third is Benchmarking organizational performance/systems against peer group which is important in order to understand wider business performance as opposed to simple inwardly-facing assessment. Fourth, setting up necessary learning loops such that the organization effectively learns how its actions affect its performance is assessed. Fifth, the ability to flex and adapt to the changing business environment without needing to overhaul the business is another important area and is explored in the flexibility section. Sixth (say what needs to be said about support services here) Seventh is a clear understating about how the contractors’ actions affect their customers is explored, which took Systems Thinking beyond the confines of the organization and out into Systems Thinking about the customer element of the supply chain.

Each of the elements mentioned in the preceding paragraph are analyzed and discussed through the reflection of the observations within the six nominated contractors. Reflection is done not only against the back drop of Senge et al’s (1990, 1994) work, but broader work from within and without the construction industry. Whilst Systems Thinking as a discipline within the LO model from Senge et al’s (1990, 1994) is not challenged within this chapter, it is important for credibility and
rigour to analyze and discussion the findings against the detailed, and more recent works referenced herein.

9.2 Align individual roles

Senge et al (1990, 1994) noted that organizations which display Systems Thinking should not have individual roles or departments working against each other. In addition, there should be exercises carried out at a problem-solving level to establish whether root causes of problems are not departments working diametrically to opposed goals. Senge et al (1990, 1994) provides examples of such incidences of misalignment such as purchasing departments whose role is to provide lowest capital cost parts (regardless of quality) to an assembly line whose role is to assemble a best quality product. Another example is seen to be a sales team whose role is to bring in new customers by offering any special deal necessary, then passing customers on to service delivery people whose role is to provide a defined service regardless of the sales deal offered to the customer.

9.2.1 Cincinnati

Cincinnati ensured that roles were renewed regularly on the basis of their current relevance. However, such changes were generally not well received by the individuals who considered such changes as a bit of a ‘paper exercise’ and, as such, not adding the value for which senior management planned. In addition, there appeared to be gaps where it was suggested that better role alignment might help organizational performance. One area where this type of job design had come in useful was in administrative roles in terms of ensuring there was no gap or overlap between roles. Its leader noted an example:

"...what we did was say "Look, write down what each of the guys do and then we’ll sit down and say "Right, that’s Dave’s responsibility, that’s Sue’s responsibility” and they know where we’re going…”

It appeared that there was little supporting literature to suggest what best practice role alignment within an organization should look like. Senge et al (1990, 1994) noted that without alignment of roles, Systems Thinking (and Shared Vision) was impossible, but offered no real practical roadmap to accomplish it. More recently, Anderson et al (2001) developed a system to measure alignment, but this was between two distinct organizations.
In addition, Cincinnati used its succession planning process to help individuals align. When looking at moving an individual into its line manager’s role, Cincinnati asked them to respond to a set of questions to test current understanding of the role they were about to fill. The answers to the questions helped identify what gap in knowledge existed to be filled by the business before the individual can adopt that role successfully. The questions used were along the lines of:

“What do you need from me to help you step up to this job?” and “If you were going to replace me, what would you do?”

Candidates were also asked to grade themselves as honestly as possible in terms of what areas they were relatively strong and weak on in terms of the new role so that an individual improvement plan could be put in place to prepare the individual for their new role. Cincinnati’s succession planning therefore appeared to approach current best practice thinking (following Groves, 2007; Hills, 2009).

When aligning the roles within the business itself, the focus group suggested that there was still work to do within the organization. For example, it accepted that there were still issues with the alignment between the estimating and commercial departments. There was an issue with the handover between the estimators and the commercial managers in terms of ensuring estimates were adequate for the project to be managed commercially, as suggested by one member of the focus group who said:

“...the final bastion sort of defence, is between estimating and commercial. Where the estimators tend to go through to when we price a job, and then the commercial guys take it on board.”

However, there was a management acceptance of this problem within Cincinnati and it was being examined for a solution. In addition, Cincinnati suggested that a lot of roles were fluid in nature and tended to come and go as the Pittsburgh work needed them to operate. Cincinnati had not assessed how successful these roles had been. It tried to remain fairly traditional in terms of the roles people adopted within the Cincinnati structure and tried to avoid ‘blue sky’ thinking in this area.

There was, however, a worrying hubris to the rest of Cincinnati’s role alignment. It was happy to state that it thought that its approach was correct because organizational performance was good. There appeared to be little appetite to experiment with service delivery in this area. The approach appeared to contradict
Cincinnati’s earlier message about experimentation being encouraged. Harris (2002) noted a similar complacency to organizational learning within the banking sector.

9.2.2 Indianapolis

Indianapolis was trying to move away from the relatively rigid structure in place to a more fluid one. The reasoning was that Indianapolis did not want its employees to become focussed upon their title, but more focussed upon serving customers. One of its directors noted:

“We are trying not to badge what we are trying to do. We’ve been driven recently by this structure. What I want to try to get back to is not having structure…”

This desire meant that Indianapolis tried to align its roles to its organizational focus upon being as flexible as possible. The approach appeared to be a move towards the self-directed work team suggested by Roper (2007) and allowed it to more easily take up and release slack in the workload without paying for people to be unproductive or having to hire more employees when work materialized. Flexibility enabled it to be more efficient for its customers through a minimization of waste. Indianapolis’ approach to personnel alignment could be reflected back to its wider approach to flexibility noted in section 10.6.

In addition, Indianapolis felt that its approach prevented the hierarchical nature which organizations naturally gravitate towards, as people without titles were less likely to adopt ‘expected’ behaviours. One of the directors stated:

“...everyone hates the ‘sparkies’ and it goes into the professional field as well. You know ”oh the bloody architect” and stuff like that.”

An example given was where it had combined its consultant architects, designers and engineers into one self-managed design team (following Roper, 2007) and dealt with one representative on that team. Indianapolis had removed the need to act as ‘referee’ between consultants blaming each other for any project failings.

Indianapolis was open about the fact that it developed its people in a way which made them marketable on the employment market. This was an interesting perspective which suggested that Indianapolis had accepted churn as part of the natural order of business. Its approach was to manage churn rather than to prevent it (following Siebert & Zubanov, 2009). In addition, Indianapolis ensured that those
who wished to remain in a certain role or level could do so. It was clear from the MD that those who wished to be an "...absolute ten out of ten job surveyor...but does not want to be a managing surveyor..." were just as important to the organization. Therefore it allowed individuals to align a non-managerial career path to the organization’s goals.

### 9.2.3 Chicago

Chicago’s directors talked about hiring the best people and then spending time with them to ensure that the organization understood their view of the world. Additionally, they took a ‘rational economic man’ (discussed in Morgan, 2006) view of employees needs. One Director stated:

"...[employees] think more with their pockets probably than they do with anything else. So the thing you must have in place is a remuneration policy that is aligned with the outputs you require."

This statement suggested that there may not quite be a Systems Thinking culture within Chicago, but that it understood that the correct motivation needed to be in place from the organization in order to best align individuals.

A further problem had been "...weeding out the [new hires] that don’t work out..." which Chicago’s directors suggested had not been successful. The MD suggested that he could identify those who were not of the right ‘type’ to succeed at Chicago within the first two months of employment. He was not, however, often strong enough to speak to them and suggest that it was not in everyone’s best interest that they continue to work there. It was suggested that this was also because if these new hires did not align with the culture, then they too could be seen to have had a poor experience (following Da Silva et al, 2010). This position was echoed by the focus group, who suggested there were those that did not ‘fit’ and who did not stay within the business very long. It may be argued that such a position suggests a potential recruitment practice problem. Systems Thinking, however, embodied a whole of organizational approach and therefore a recruitment problem suggested a deeper problem within Chicago’s system which had not been addressed.

Chicago’s MD suggested, however, that Chicago’s culture had grown out of the people who had joined over the years, commenting:
"I think organizations are sort of Darwinian objects, they evolve over time and new people come in, new gene sets come in and get discarded."

His view appeared to be diametrically opposed to the view espoused about new hires now – that they did not influence Chicago’s culture, and that they needed to fit the existing culture. Although the evolutionary theory of the organization has been well established from research into organizations such as Toyota (Muffatto, 1999), it may be that Chicago had reached a point of cultural alignment that it did not wish to change. This position further suggested that Chicago was more of a LO in the past than it was at the time the research herein reported was conducted.

The lack of written processes within the business encouraged individuals to pass on the expected ways of working to new hires. One member of the focus group noted:

"...what I've learnt when I started and I think I pass it down too. As I move up I think I pass it down to my site managers. There’s certain ways I like things done."

This approach encouraged a consistency in the way that roles were executed from one role holder to the next. In addition, Chicago went down a route of standardizing key areas, such as site setup, which allowed individuals to more easily pass roles onto each other as part of a learning process. Kim & Seo (2009) described such learning by doing as the predominant learning model in ‘trades’ based roles. The focus group suggested, however, that Chicago could have further improved the after sales service and standardization of site setup and thereby improved its standing with its customers.

9.2.4 Dallas

Dallas aligned its appraisals to the overall business plan through a cascade process and according to one of the directors:

"The appraisal flows from the business plan so I’ll sit down and agree objectives and targets with the Board...the line managers take that and say ‘These are the objectives and targets for our department this year’.

Whilst this process appeared to be well aligned, the main weakness apparent was that all the flow of alignment came from the top down. There appeared to be little moving in the other direction. This one-way flow suggested imposed alignment rather than an alignment which all parties have the opportunity to influence, as suggested
by Senge et al (1990, 1994). A reference to training “…falling out of the bottom…” of the appraisal did not sound like a commitment to developing individuals, but more like a necessity to achieve the vision of the board.

9.3 Coordination

For the purposes of this section, the Oxford English dictionary definition of coordination will be assumed (www.oxforddictionaries.com):

“The organization of the different elements of a complex body or activity so as to enable them to work together effectively: an important managerial task is the control and coordination of activities”

9.3.1 Cincinnati

One of Cincinnati’s parent companies implemented a ‘gate system’ to control its projects which underpinned what it did throughout the organization. Individual business units had very little latitude to decide how the system should specifically be implemented on their projects and for particular customer programmes. Its leader noted:

“…the leadership from [country name removed for identification purposes] said…this is what we’re going to use. So you can either make it user-friendly for yourself or you can bitch and moan and go through sideways…”

The disadvantage with such imposition was that Cincinnati needed to adapt the system for use with Pittsburgh. The advantage, however, was that it allowed any Project Manager (PM) to take on another’s project should the need arise, as the underpinning management system would be the same. Whether there was too much restriction (as the system did dictate when reports should be issued and in what format) from bureaucracy was debatable, but Cincinnati viewed the system as a strength as it aligned to its business strategy, as noted by Cooke-Davis et al (2009) who advocated the need for alignment of strategy and project management systems.

Some systems in Cincinnati’s parent companies deliberately did not coordinate, due to the nature of its customer led programmes of work. One example of lack of coordination was its 3D computer aided design (CAD) systems because customers usually had their own systems. Cincinnati’s leader advised:
"What you find is, with the type of business we’re in, the client will have a system. So we’ll have AutoCAD. We’ll install AutoCAD. You want it done in Micro Station. We have people who can do that."

Cincinnati’s parent companies responded to this change by investing in the skills necessary to operate the systems rather than purchasing the systems themselves. Cincinnati was therefore able to adopt and adapt to Pittsburgh’s system easily. If a customer did not have a system, Cincinnati’s parent companies could acquire a temporary license for a system with which to carry out the project design. The approach demonstrated an excellent understanding by Cincinnati’s parent companies of how they were part of the wider system that was the UK construction industry.

There was a potential Systems Thinking disconnect identified within one of Cincinnati’s parents in terms of the way that projects were won and then delivered. The manager of the delivery of Cincinnati’s programme stated that it was his job to “…deliver what [the sales & marketing team] have said…” The statement suggested that the delivery team had little involvement in the process of winning work. This scenario would potentially cause a similar situation to one put forward by Senge et al (1994) where one department was targeted in such a way that the way that it acted to achieve its targets caused problems for other departments. Cincinnati appeared to compensate for this apparent lack of co-ordination in its Systems Thinking by relying upon a resource utilization system and having representatives from each department seated on the board of directors. The representatives reviewed each potential bid and questioned resource availability and how service would be provided before any bid was approved.

9.3.2 Tennessee

Tennessee took a slightly wider view of the coordination role in that it had a team dedicated solely to translating design information from the customer’s consultants into a buildable product. Tennessee’s MD put it:

"...we’ve actually got people who translate sometimes the nonsense that we get from the consultancy field into something that we can actually build...”

This approach demonstrated Systems Thinking in that Tennessee understood how it could add value to the full construction process outside of what might be considered its ‘usual’ remit. Tennessee suggested that improving ease of construction of the asset gave it the ability to remove wasted cost and/or time and improve the quality
of the finished product, as suggested by Lam & Wong (2008). It encouraged the
design consultant, if there was one, to consider the project as a whole process rather
than simply a finished product.

9.3.3 Indianapolis

Indianapolis suggested that its coordination came from its five directors of its five
major accounts working closely together and employing their differing yet
complementary skills. A focus group member noted:

"Each director is responsible for an account but within that system also each
director has got his own skillset."

Supporting each director were two associates who also had a mixed background and
worked closely together to understand each other’s workloads. Furthermore, the
responsibility and ownership passed through all levels of the organization which
encouraged the teams to self-coordinate (following Roper’s (2007) research on self-
managed teams).

There may have been a slight coordination disconnect in terms of the feasibility team
winning work and then passing it to the delivery departments, but Indianapolis was
broadly happy with the way the process operated as the passage of work came
through the directors who managed delivery anyway. Furthermore, Indianapolis
rarely tendered competitively for work and preferred to focus upon its “blue chip,
repeat work” customers as these customers were considered to be more reliable,
Indianapolis understood them and it was easier to coordinate and manage the work
to deliver an excellent product. A member of the focus group noted:

"...Do a good job and the money will come. But it’s all about the delivery.
And I would say we’re more delivery-focussed than cost-focussed..."

Indianapolis also appreciated the gap between how different individuals perceived the
business. Such appreciation meant that whilst its vision might be more developed at
board level and cascaded down rather than developed by the whole organization, the
level of communication at least gave individuals understanding of what was
happening throughout the business. Christenson & Walker (2008) noted that a well
communicated vision (shared or otherwise) was still crucial to project success. The
focus group accepted that some things may take longer than others to filter through
Indianapolis, as one member commented:
“It takes time to drip down. But hopefully it’s a fairly consistent message that goes down.”

This comment suggested that the Indianapolis intranet was not as widely used as it might be.

9.3.4 Chicago

Chicago too ensured coordination of departments by keeping its senior staff involved with a cross departmental view of what was going on within the organization. In addition, the directors understood the limitations which each profession brought to the table along with its expertise. Chicago’s MD advised that:

“...if the commercial side of the business is left to its own devices you'll never get a project delivered because it'll take forever to procure anything...”

Chicago’s solution to this limitation was to make such departments responsible for the projects and make the other departments subservient. Any coordination issues that could not be sorted out by the PM were escalated to senior management.

Chicago had learned the lesson to have the PM in charge from a previous situation where several professions were reporting to line management rather than task management. One of its directors stated:

“...rule of thumb is that commercial is always subservient to project management. And that any one project always has a single individual whose responsibility it is to safely and profitably deliver that project.”

Whilst the PM-led approach solved the problem that Chicago had, the solution did not appear to be true Systems Thinking. For example, PM design decisions may adversely impact the commercial team. It may be that this solution that was employed may cause different problems in the near future (Senge et al, 1990, 1994).

9.3.5 Dallas

Dallas created a Systems Thinking environment by giving senior individuals and their teams the opportunity to work within other departments. This experience helped employees understand how their actions impacted upon each other (following Senge et al, 1990, 1994). For example, estimators could support with quantity surveying; quantity surveyors could support with estimating and project management. There was, however, an issue of the individual ‘businesses’ (offices) competing with each
other for the same work which had yet to be resolved, as one of the directors pointed out:

"...the problem of the group though is the cooperating companies do stand on each other's toes. It's probably a failing where two companies could go for the same job that's on the borderline of their areas..."

This problem had still to be resolved and suggested a lack of Systems Thinking in this area.

For its repeat customers, Dallas was much more coordinated. When the business development team had acquired more Washington projects than its delivery team could complete, the business development team contacted Washington and returned one major project giving the reason that Dallas wished to maintain the quality of its service over the pursuit of turnover and profit. The directors noted:

"It was a big decision at the time to turn £7m worth of work down, a few gritted teeth and whatever but it was the right decision..."

There appeared to be no literature outlining a process for rejecting such work in the construction industry, suggesting therefore that this decision making process for construction would represent a new line of enquiry. It may be suggested, therefore, that this finding may be seen to make a contribution to practice in the construction industry. It is, however, beyond the scope of this thesis to examine this point further and this is an area for future research.

The focus group was more critical about the link between the various departments. The suggestion was more that there was a good interaction and exchange where time permitted and that for the rest of the time, there could be a lack of understanding between departments. One focus group member advised:

"...the estimators will do their bit and that's the estimate, you've got the job. And then it will just be a handover...I mean I'll finish one job and then, 'Oh you're doing this, bang.' And the price is agreed..."

On the whole, however, it was suggested that this approach did not cause major problems due to the level of understanding between departments but it did not appear to represent Systems Thinking (Senge et al; 1990, 1994).
9.3.6 Kansas

Kansas did not find ensuring coordination between departments difficult, mainly due to its small size. Furthermore, it held regular directors’ meetings which gave the organizational leaders visibility of what their counterparts were doing. Similarly, surveyors were interchanged regularly between project types and roles such that each gained an understanding at a functional level of how each client stream worked. Kansas’ MD noted:

“...we let them work on each other’s projects, we encourage that.”

There was one notable omission from Kansas’ coordination system and that was Kansas’ joinery shop, which operated independently. The MD suggested:

“The only ones who tend to work on their own quite a lot are the joinery surveyors, because theirs is a little bit more specialist...”

This statement suggested a potential important disconnect between manufacturing and project management at an operational level. It may be argued that this disconnect was offset by the high experience of the joinery shop director who understood construction programmes and prioritized his work accordingly. He could recognize when one PM was ordering joinery too early to create float. The fact that he needed to be able to recognize such situations suggested a lack of ingrained Systems Thinking within the construction PMs. That Kansas relied on an individual to manage the process, rather than an ingrained cultural awareness, suggested a lack of a true Systems Thinking culture (Senge et al, 1990, 1994).

9.4 Benchmarking Organizational Performance/Systems against Peer Group

Benchmarking can be defined as “contextualizing the current performance of the organization through comparisons with other organizations in order to improve” (Askim et al, 2010). Whilst it is accepted that this is not the only definition available in contemporary LO literature, this definition is useful to outline the concept being analyzed in section 10.4.

9.4.1 Indianapolis

Indianapolis relied largely on its customers to set its benchmarking, which it then aligned with internally. One of the directors noted:
"...our teams or our individuals’ KPIs are linked to our client’s KPIs..."

All members of the team were jointly responsible for achieving certain standards which ensured that it achieved its customer benchmarks. Its customer aligned internal benchmarking model was still under development and it suggested at the time of the research undertaken for this case study that it was still three months away from completion. Indianapolis (and Cincinnati) took their benchmarks from their customer rather than using latest best practice to develop their own, which can be contrasted to Gapp & Fisher’s (2008) Total Quality Management (TQM) approach where the benchmarks were developed by the supplier, but with a total customer focus. Such an approach suggested another departure from Senge et al’s view, as the customer was the driving force behind learning within these organizations rather than merely being the focus of such learning (Senge et al, 1990, 1994).

9.4.2 Tennessee

Tennessee was more advanced in its range of benchmarks employed, but again only benchmarked internally on matters of process. Externally, it did take a lead in benchmarking its performance from the customer perspective by implementing customer feedback forms. Seeking direct customer feedback was seen to be something the construction professional services industry had done for years (following Amidu et al, 2008), but was not the norm for contractors. Tennessee’s forms were aligned to the business culture and rewards system through the fact that a donation was made to charity for each one returned and 5% of Directors’ bonuses were linked to results on these forms. The MD noted:

"...we pay money to charity for each one that we get back which encourages them to come back, keeps the numbers up...5% of directors’ bonus is actually related to those forms alone."

In addition, the feedback results were posted prominently by the MD within the organization so excellent achievement became visible. The MD commented.

"...we then have a system of notice boards...each board has ten notices on it and those ten notices are changed on the first of each month every month without fail..."

There was, however, a cultural question raised when it was revealed that the posting of results was used more to focus on those who had not achieved the best scores.
Especially good feedback letters from customers were posted around the business for all to see. This feedback was thought to provide positive motivation across the business for PMs to get their project posted.

9.4.3 Dallas

Dallas did not really employ benchmarking to assess its performance; rather it stated that a customer returning to do business again was its benchmark. One of the directors stated:

"Our benchmark is the client coming back. I don’t think there’s a better way is there?"

The weakness of the approach was that the only way to identify poor performance presumably would be the loss of a customer and thus it may be argued that Dallas’ approach fell short of current best practice (c/f Gapp & Fisher, 2008). Dallas also relied on customers such as Washington to carry out the benchmarking on its service and inform it when service was not satisfactory. It may be argued that such an approach to benchmarking was reactive as it had to wait until interaction with Washington before it could understand how it compared to its peer group. The only internal benchmarks that it recorded were profit level and health and safety.

9.4.4 Kansas

Kansas’ benchmarking appeared to be entirely internal and entirely financial. Kansas team leader for the Oakland commission commented:

"...we haven’t got KPIs in our business, you know they just don’t...they don’t exist."

Kansas’ benchmarking of its financial performance had driven some Systems Thinking along the lines of a Lean approach. The team leader also stated:

"As soon as [product] left [Kansas premises] and went on to a lorry, time was ticking that they started eating away, eroding into that profit...So then we had to put something in [the contract] which could get us the value back from those visits...”

Like Dallas, this approach was far below current best practice (c/f Gapp & Fisher, 2008).
9.5 Learning loops

Argyris & Schon (1974, 1978) coined the terms single and double loop learning. Single loop learning he suggested is of the 'identify error, correct error’ type. Double loop learning is where an error is detected and the correction involves the alteration of organizational norms, policies and objectives. In order for an organization to be an LO, double loop learning must be present. As can be seen from section 10.5, much of the learning loop activity within the participant contractors depended upon single loop learning.

9.5.1 Cincinnati

Cincinnati concentrated on ensuring that good and innovative design ideas were fed back into standard design. Such feedback was carried out by its dedicated team who harvested such ideas and tried to ingrain them into service delivery. Its approach was not always successful and was an area that Cincinnati was actively looking to improve. Cincinnati’s approach was some way from best practice as set out by Kroners & Goffin (2007), who noted the use of Post Project Reviews as best practice learning vehicles. As one member of the focus group noted:

"...some of the information that comes into the alliance isn’t always necessarily disseminated, but they are improving that."

The focus group suggested that improving the informal communications by locating all its employees on one floor helped to improve the learning loop.

9.5.2 Tennessee

Tennessee tried specifically to structure its operations to defend against repeating mistakes. It observed that the problem with having a single PM on a project was that if he/she disappeared permanently, or even temporarily, there was the risk that his/her knowledge went with him/her and that mistakes could be repeated. Tennessee mitigated this risk through the separation of the project and contract management roles. It accepted that separation added overhead, but that it ensured that knowledge about a project did not reside within one individual. This strategy helped to avoid mistakes and made it easier to share knowledge in a process that aided effective feedback.

Tennessee’s MD viewed the contract manager role as key to its learning as an organization, commenting:
"…we actually have contract managers above project managers. Now, okay that’s an extra overhead in a way, but it’s quite crucial to the smooth running of the company."

The contract manager spent perhaps only a fifth of the time on a project compared to the dedicated PM. S/he did not understand the detail of any one project, but through such interaction, s/he understood the important issues on numerous projects. Such interaction made the collection and deployment of knowledge easier. Further to the contract manager, Tennessee had a core team that understood each customer’s programme of work from the strategic perspective. This team ensured that the learning from the contract managers was dissipated to ensure one learning curve for each issue, rather than several. Thus, the contract manager was seen to play a pivotal role in the learning loop.

9.5.3 Indianapolis

Indianapolis had a frustration around learning loops in that they did not happen to the extent that it would like. Some senior individuals within the organization tried to lead by sending information out and actively requesting feedback, but this proactiveness did not seem to have helped. In addition, individuals still created innovation on projects and did not feedback to the organization. Leach et al (2006) noted that the most creative and successful ideas were generated and implemented within organizations when informative feedback was present. The language used when Indianapolis discussed this topic was one of frustration (for example, the use of the word "…haphazard…") rather than the language of investigation.

Indianapolis employed more ‘push’ techniques to try and encourage individuals to create learning loops, but appeared to have omitted the step of examining why loops had not developed as part of the day to day working practices. As one of the directors suggested:

"We are also trying to tie it in with our communication which is going out to them. Providing the feedback via a mechanism which they’ve been – well they won’t even know that they’ve been suckered in. They’ll think ‘well this looks good. Let’s have a look at that.’ And actually I think that, and they will hit the button and it will provide us with the feedback."

What Indianapolis tried also to do was encourage site labourers and craft workers to feedback on what processes worked best on site, following Leach et al (2006).
Indianapolis viewed these individuals as those most likely to have good ideas that could be applied on site.

Indianapolis’s struggle to gain feedback was interesting, given the positive way focus group participants spoke about the learning loop enablers in place, with one member stating:

"...because it's quite a flat structure as well, it's quite easy - as I say even four or five years ago when I was a packing manager, it was always an open forum...”

Leach et al (2006) noted the amount of feedback as a key idea enabler, which the availability of open forums should increase. The focus group discussed an open door policy, an enthusiastic management willing to listen, freedom to experiment, a flat structure, post project reviews, the intranet and a customer base who expected innovation. Despite these approaches, the problem seemed to be the motivation of people to put ideas forward. The most successful strategy appeared to be the post project reviews, the results of which were fed back to the Indianapolis directors to roll out into new projects and into its customer Miami’s centre of excellence.

9.5.4 Chicago

Chicago’s directors suggested that having set customer teams was an excellent enabler for learning loops. One director asserted:

"...it completely relies on there being relatively small teams of people pointed at a particular end user market.”

In addition, a feedback report produced by the customer team director was circulated monthly and included a lessons learned section. The report was circulated during a lessons learned meeting at the end of each project. The lessons learned session included a question and answer session, a round table session which encouraged knowledge exchange. The outcome of these meetings was then circulated via e-mail to others in the business. Having a formal process for lessons learned was recommended by Kotnour & Kurstedt (2000). Additionally, Chicago carried out review sessions with Minnesota which consisted of sixty standard questions, the responses to which were circulated and used to create improvement actions.


9.5.5 Dallas

Dallas suggested that most of its current processes were built up through its learning loops or ‘SIMS’ system as it is known within the organization. The process involved discussing mistakes made and altering processes to avoid them happening again. The directors reviewed a project and site with its team, e-mailed out the findings and learning throughout the business and then followed up with an end of year review where all major changes were reviewed to ensure organization-wide implementation. One of Dallas’ directors noted:

“...we’ll say basically ‘these are the good points, these are the bad points and what we’ve seen on site this is new stuff... this is what the impact it will have on your business on your development when you’re building it next year...”

This process was viewed by all as being informal, yet effective. Dallas’ view of its current informal system being effective may be due to a lack of exposure to a best practice formal system, such as recommended by Kotnour & Kurstedt (2000).

9.5.6 Kansas

Kansas admitted that its learning loops were not as advanced as they might be and that it usually was only the projects which went wrong which went through a review loop (referred to as an After Action Review by Oakland). It suggested that the learning from the projects which go well was likely to become lost. The MD noted:

"When something goes wrong, they all want to sit around a table and talk about it. "Why’s it gone wrong?"...So what tends to happen is you get all the bad learning...”

Kansas did not elaborate as to whether such ‘negative feedback’ was sought at an individual level which, as Belschak & Den Hartog (2009) noted, could produce counterproductive results.

The focus group, however, appeared unsure of whether and how the organization used learning loops. They assumed feedback was dealt with at director level where deemed necessary. One group member stated:

"...they (director level) can deal with that, you know feedback from Jason or anybody...”
It was accepted that at the end of each year on a large project (and at project handover) feedback was provided to understand how things could be improved. The annual reviews were used to improve the performance of the specific project. The review carried out at the handover stage was used to develop feedback for the next large project, but they were done at director level and focused mostly on cost issues. The focus group noted that the smaller projects were fast tracked and thus lacked the time for learning loops to be employed.

9.6 Flexibility

Morabito et al (2009) defined organizational flexibility as:

"The capacity to rearrange or reconstitute a system configuration to adapt to an internal or external imperative".

This definition will be assumed throughout the section 10.6 and all analysis is reflected against this definition. This has been done as the definition above refers well to the imperative set out in the customer interviews for the need for flexibility. Such customer requirement could be defined from the perspective of the contractors as an external imperative.

9.6.1 Cincinnati

Cincinnati coped with the need to flex its operations through the use of 40% agency staff within its workforce. This staffing strategy helped it to cope with dips in workload such as the one experienced during the recession. It considered agency individuals to be as much a part of Cincinnati as direct employees. In some cases agency employees had worked for Cincinnati for many years. In addition, there was research that suggested that the presence of temporary employees enhanced learning (Wiersma, 2007). Agency staff could be called on and released at relatively short notice. The agency workers were inducted into Cincinnati appropriately, even though they were not direct employees. The combination of direct and agency staffing allowed Cincinnati to maintain quality and flexibility of service concurrently.

In addition, being a JV allowed Cincinnati to call on its parent companies for resources. Conversely, in slower times it could return individuals to those organizations. Its parent companies also operated in numerous customer industries. Cincinnati’s leader stated:
"...it is like having a chair with several legs – you can saw one off and still sit on the chair, it doesn't fall over".

This statement suggested that having organizations like these as parent companies gave it significant advantages over its peer group. Ho et al (2009), however, noted the difficulties in managing JVs from a resource perspective and that the governance structure had to be correct to ensure smooth operation. Cincinnati’s success suggested that its governance structure was correct.

9.6.2 Tennessee

Tennessee struggled slightly with flexibility in terms of moving people from one sector to another due to the fact that it was a diverse organization. Therefore, whilst individual skills might be transferable, there was the issue of bringing individuals' technical awareness on particular industries to an acceptable level. It did, however, suggest that its staff possessed the necessary self motivation and professionalism to self-educate as necessary. Such a process must assume that the individual could self-assess skills needs accurately, something which Dunning et al (2004) had discovered was sometimes not the case. This position suggests a development gap in Tennessee’s ability to flex the organization.

Another issue in this area was communication with the customer in a way that s/he understood. Tennessee’s MD noted:

"...the main issue is more at high level about your ability to effectively communicate with your customer base in the language that the customer base actually understands..."

So whilst Tennessee may move someone with the correct technical skills into a customer team, it must ensure that person understood the customer’s ‘language’.

In addition, Tennessee’s MD suggested that its regionalized structure helped it to flex. Each one of the regions stood alone as a business unit, and did not need to rely on control from the centre. The MD stated

"...you’re not actually talking about having to worry about a [£value] company if you’ve got, say, twenty business units in it. Each one is only [£value] and there you can see very clearly what it is you need..."
Units could, however, support each other through providing, or receiving, staff and/or projects in times of flexing necessity. It did, however, acknowledge that due to the nature of construction, it was easier to move work across geographical boundaries for professional personnel than for skilled labour.

9.6.3 Indianapolis

Flexibility appeared to be the element which Indianapolis viewed as its key differentiator from its peer group. Most of the responses to questions during the case study reflected on its ability to be flexible in terms of how it serviced its customers. Indeed, Morabito et al (2009) noted that flexibility was an element of many successful 21st Century organizations. One of the Indianapolis directors stated: “I think the company works better when it’s working at 110% [of capacity].” The desire to work at such capacity made it focus upon being flexible in order to perform and develop the business. Indianapolis understood that its customers were in a constantly flexing retail market and that it had to flex accordingly. In order to assist Indianapolis with being flexible, it did not enforce a strict contract as did some other customers in the industry.

Indianapolis’ directors were, however, struggling to contract in response to the recession prevailing at the time of the case study research. One director advised:

The last lot we did in March and we did about 30, they were the ones, you know really hard; people we didn’t necessarily want to lose, people we liked. You know their personal circumstances, you know the market and it’s devastating. It’s devastating for the firm and as individuals because you know we know the wives names, you know the kids names; you know how old the kids are. And you’re absolutely devastating people’s lives. And that again goes back to the sort of culture, what we’re about. We try to have this sort of family firm feel to us, and you’re destroying people’s lives, so that’s a really hard thing to do.

Given the ‘family’ culture it possessed, releasing people in such downturns proved difficult for Indianapolis.

Indianapolis did, however, also make use of agency personnel to aid the flexing process, albeit it was very selective about whom it used (following Wiersma, 2007). It was keen to set up an agency ‘pool’ with its competing suppliers to its key customers in order that the best agency talent was retained. The idea was that a list of
‘approved’ agents was shared between the organizations and was called upon as workload flexed. One of the directors noted:

"...we used to have a guy who owned his own agency company working for us. So he would work for me and I would use his agency people because he understood the business."

Such an idea allowed all parties to flex with the workload whilst maintaining the quality of service and retaining the maximum amount of knowledge within the supply chain. Indianapolis had not been able to garner the interest from its competing suppliers to Miami. Indianapolis suggested that an idea like this would have to be a customer-led initiative.

Indianapolis’s flexibility extended to its stated lack of rigid processes, which allowed its employees working on individual projects to be able to introduce new ideas (following Morabito et al, 2009). This lack of rigidity was clearly demonstrated in the focus group, with a group member commenting:

"...if you asked everyone in the firm to draw a company structure it would probably be slightly different...We’re quite happy to leave it like that I think really, because it means we can leave it a little bit flexible..."

Indianapolis suggested that this level of agility was necessary due to the increasingly demanding nature of its customers. In addition, its relatively small size compared to other tier one contractors in the industry was an advantage in terms of its ability to flex, given the small management team, narrow customer base and shallow structure.

**9.6.4 Chicago**

Chicago’s MD was blunt about the need to flex in the face of a changing environment. Chicago’s position was one of needing to hire and fire in response to market changes, whilst trying to retain the core of the best people, as one of its directors suggested:

"...unfortunately that’s what you have to do. That’s the tragic thing in this business that it’s incredibly peaky and it’s very hard to plan..."

Chicago tried to plan its flexing by speaking to Minnesota and others about the frequency, size and nature of upcoming projects to avoid the need for redundancies, although the aforementioned statement suggests a lack of scenario planning (Senge
et al; 1990, 1994) at an organizational level. Chicago was proactive in passing on cost savings to customers where the recession had driven its supply chain costs down. Proactive flexing avoided customers forcing the issue by asking for cost reductions in times when customers knew construction costs were declining.

It was acknowledged by Chicago that there was a need to improve productivity. The irony was that it was suggested that there was not enough time to work on this aspect and was an area that Chicago was looking to improve in the future. The MD asserted:

"...I don't think we concentrate enough in this industry on productivity. That's the part of the whole construction process which I personally would like to spend more time looking at..."

This viewpoint suggested a lack of 'sharpening the saw' (c/f Covey, 2004) view of the organization with individuals spending time working with inefficient processes instead of taking time out to improve those processes.

9.6.5 Dallas

Dallas stated that it felt ahead of its competition in terms of flexibility. Individuals talked of previous organizations they worked at where the attitude was "...Oh that’s his job, that’s his job, that’s his bit..." which was a culture that current employees were happy to say was not present within Dallas. Its culture was very much to understand what the customer needed and then to be as flexible as possible in ensuring that it was delivered (following Morabito et al, 2009). The only limitation to this approach was that Dallas would never flex to the point where it put the organization at risk. It would not, for example, deploy staff onto Washington projects to gain turnover at the expense of quality.

In terms of flexing to get a project started quickly, Dallas had been in the situation where the MD had personally set up and managed the site for the first week until a PM had been made available. Dallas’ MD postulated:

"...we’ll start Monday on this extension or refit we’re there Monday. We’ll find a way. If that means him, I or Mike or Don sitting on site for a week we’ll go up and do it. And if we really can’t do it which isn’t very often you have to accept ‘Washington you’re better off looking somewhere else because we won’t let you down’."
The preceding assertion is interesting as it was seen to reinforce Dallas’ approach of rejecting work which it felt it could not deliver to the required quality. In addition, Dallas focussed on retaining customer knowledge within the organization even when there was little work being undertaken with a particular customer at a particular time.

Dallas looked only for organic growth, which it had the luxury of doing due to the fact that it was not a PLC. One of Dallas directors noted:

“I’d rather do five jobs properly than just get away with six jobs or seven jobs perhaps badly. There’s no benefit to us long term on that. [Washington] know we want to grow gradually.”

Further research into Dallas’ approach to growth is seen to be required. As McKelvie & Wiklund (2010) noted, there is little research into such growth strategies.

Dallas’ processes had been set up specifically to cope with the flexible nature of the retail construction arena. It had set up a three year expansion plan alongside Washington so that the two businesses could develop in harmony. One of Dallas’ directors stated:

“... that’s a fantastic thing for a customer to say "Look how do we work together for the next three years?“

The recession, however, destroyed that plan and the strategy was revisited by both parties. Dallas stated that some of its peer group had complained to Washington about the impact of reduced workload, but that its approach had been more constructive and yielded better results. To help cushion the blow, and to ensure the retention of knowledgeable individuals, Washington offered Dallas projects outside of its historic geographic area, which Dallas had been required to flex geographically to be able to deliver. Such a level of customer involvement in the running of a supply chain organization again appeared unique within contemporary research.

Some of the senior Dallas PMs discussed willingness to ‘step down’ to assist on a project. For example, a PM went to a project and took the hierarchically lower position of site manager under an existing PM in order to ensure that the project was delivered satisfactorily. A member of the focus group stated:

“...I’m a project manager I’d normally run them, you can actually be put in as a site manager or an assistant to someone else...”
The existing PM may not possess as much total experience as the new ‘assistant’, but the important thing for Dallas was not maintaining the hierarchy, but maintaining individuals who understood the customer in key management positions. Again, there appeared to be little contemporary research which suggested such willingness to flex roles like this in other organizations.

Dallas had mixed the flexibility to work in the manner that customers such as Washington required with the requirement from those customers to challenge poor customer decisions using a ‘risk and reward’ approach to its advice. The decision challenge element appeared weaker than customers suggested they looked for from their excellent contractors. One of the directors stated:

…if [Washington] want to do something in a specific way it’s not up to us to challenge them and question what they’re doing, we just go with them. What we do is we don’t sit there and say "Yes sir" and "No sir" and all that what we’ll do is say "Fine if you want to do it that way great. We can do that but the implications of doing it your way is x, y and z.

Dallas’ position mapped to the view from the customers set out earlier in this thesis that appropriate challenge of their decisions by first tier contractors was a demonstrator of excellent performance.

9.6.6 Kansas

Kansas noted that its need for flexibility was to be able to react to the moving marketplace. It stated that flexibility was moving from being proactive and planning to flex for upcoming business environment changes to almost ‘panic’ mode reaction to a rapidly moving market. From the directors came a comment that:

"...you go in a panic mode - it’s not so much panic it’s just more reactive. Once you’ve got through that reactive mode then you can sit back and be...more proactive."

Such an experience suggested a lack of scenario planning (Senge et al; 1990, 1994), which aligns with the fact that there are no notes attributable to Kansas to record under the Scenario Planning section of this thesis. The above commentary also confirmed that quick reactive behaviour within Kansas did cause problems later on in the process (Senge et al; 1990, 1994).
One way in which Kansas had ensured an ability to flex was to retain a multi-skilled workforce. A member of the focus group noted:

"...they might be a carpenter but they can, you know some of them can lay bricks, lay floors, cut ceilings and plaster".

This was a relatively recent development in Kansas’ makeup. In addition, tradesmen (sic) historically tended to become compartmentalized within one customer programme of work. Nonetheless, such compartmentalization had changed and individuals were encouraged to move between customer programmes to gain the experience necessary to give Kansas flexibility. Chang et al (2005) noted that the multi-skilled workforce approach was already prevalent in manufacturing.

9.7 Support services

For the purposes of this thesis, support services were defined as those ‘essential non-value-add’ services which supported the ‘value-add’ services being provided directly to the customers by the contractors (Womack & Jones, 2005). For example, customers received design, specification, construction and specialist advice services from the contractors as value-add services. Supporting these services would be essential services such as human resources, information technology, and secretarial. Whilst the customer was unlikely to have interaction with these services, they were essential in the overall provision of service to the customers.

9.7.1 Tennessee

Tennessee, being the largest of the case study organizations, recognized the potential for support services to do more to obstruct what the organization was trying to achieve than actually support it. The presence of such understanding was seen to be a key tenet of Senge et al (1990, 1994) when assessing the presence of Systems Thinking. The phrase "...I’m from head office, I’m here to help you..." was humorously suggested by the MD as being one to strike fear into the workforce. Tennessee recognized that profit and growth for the organization was not generated by the accounts or IT departments and it took steps to ensure that "...the tail doesn’t wag the dog...". To ensure a situation where support services did not come before customer service, it engaged more closely its customer facing units with its support services.

It achieved such engagement in two ways. First by engaging support services more closely in the delivery process. Second, by including them in internal customer
service delivery workshops. This approach gave these departments a better understanding of how they could support the organizational vision. The outcome was a better mechanical and cultural alignment of the support services to the customer delivery units and to each other, following best practice Systems Thinking in Senge et al (1990, 1994). This approach was considered to be another excellent demonstration of Systems Thinking having improved the operation of the organization. Tennessee appreciated that there would be an ongoing piece of cultural change work. It never wanted to be in the situation where it could not alter a department’s way of working while that department hid behind the “...this was the way things were done round here...” argument.

It was interesting to note that many of the comments on support services from the other case study organizations did not go into the same depth as those of Tennessee. Therefore nothing further can be added to this section from the research into those organizations. It suggested that there was not the depth of Systems Thinking in this area as there perhaps should have been, albeit the precise reasoning is beyond the scope of this thesis to study further.

### 9.8 Systems Thinking about the Customer

This section dealt with incidents where contractors extended their Systems Thinking (Senge et al 1990, 1994) beyond the confines of their own organizations and into the customer organization. From this perspective, the contractors understood the impact of changes in their systems upon their customer’s systems and visa versa. In addition, contractors were demonstrating an understanding about how best to operate their customer’s systems for them to avoid negative or unwanted results remote from the immediate action (Senge et al 1990, 1994).

#### 9.8.1 Cincinnati

Cincinnati tried to understand the difference between what its customer Pittsburgh wanted and what it actually needed. This was because it understood that Pittsburgh was a many faceted entity with numerous stakeholders. In Cincinnati’s case, it was employed and instructed by Pittsburgh’s engineering division, but the product it provided was used by the operations division. To solve this apparent dichotomy, Cincinnati set up meaningful relationships and dialogue with the operations division to ensure that it was informed as to what products were being provided. Ling et al (2006) noted that a key determinant of project success was the contractor’s ability to understand customer needs.
9.8.2  Tennessee

Tennessee continuously questioned, listened to and acted upon discussions with its customers. It carried out satisfaction surveys, as do many organizations (c/f Mbachu & Nkado, 2006), but it suggested that these were different in the way that Tennessee reacted to the feedback. As noted earlier in this thesis, directors’ bonuses were linked to ensuring the feedback from its key customers was excellent. This strategy ensured that Tennessee focused on customer relationship building and addressing issues of displeasure. One example was the approach to managing out defects from the construction process as it was an area that had consistently hurt Tennessee's customer satisfaction scores.

In addition, it understood that not all customers want innovation and that some wanted tried and tested solutions. It therefore focused its distribution of ideas to where they were seen to be most effective. It gained an understanding of which customers responded to which types of solution and therefore demonstrated clear learning from interaction with the business environment. In addition, Tennessee’s revelation departed from most of the contemporary research which tended to focus upon how MORE innovation could be brought to the construction industry at customer behests (c/f Vennstrom & Eriksson, 2010).

9.8.3  Indianapolis

Carrying out the case study on Indianapolis revealed that everything it did was focussed upon its customer and how it improved service. This focus was particularly clear when it came to carrying out the peripheral actions which it knew maintained customer delight. The MD noted actions such as investing money in the local communities where its projects were proceeding. Smith (2003) noted that the industry needed to improve its community relations if it was to improve its image. Indianapolis directors noted their approach, with one commenting:

"...the accommodation that we were using as a site set up. We were going to, with our £1,000 plus just convert it into a building for the community."

Another conscious decision from Indianapolis was choosing not to pursue all monies due under strict contractual terms. Indianapolis noted that other contractors did not display such behaviour and viewed its different behaviour as an investment in its customer relationships.
Indianapolis possessed a keen understanding of its position within the investment appraisal arena for Miami. For example, it understood that to a certain extent, Miami’s decision making processes were not predicated upon whether the capital cost of a product was £10 or £10 million, but upon the Return on Capital Expended (ROCE). One of its directors opined:

“…that’s an option that we can give, and it makes the whole investment return better figures. So that’s all about, you know, what we’re trying to do. We’re trying to be a lot more than just builders.”

Indianapolis tended to make its construction decisions on the basis that an understanding of the impact upon Miami’s retail sales through disruption or late completion was paramount. Indianapolis’ approach appeared to be an extension of Roper (2001) who wrote on aligning real estate strategy with corporate strategy from a purely customer-centric perspective.

A further example of Systems Thinking was the way that Indianapolis interacted with Miami’s customers, the public. It tried to communicate on behalf of Miami about what was going on during a store refurbishment project and how it would benefit the public once it was complete. This tactic further demonstrated Systems Thinking in terms of understanding the impact of Indianapolis’ actions upon its customer’s business. Its approach extended to simple things such as thinking about how the paying public felt about an element of the completed project and tailoring it accordingly. The approach extended to the parking of works vans, with one director asserting:

“…if we're doing that you've got to think about where your vans are parked. So all the customers want to park outside the front door...make sure we're at the worst possible place…”

Indianapolis’ approach was another area where the research reported in this thesis may be seen to make a significant contribution to current research as there appeared to be no contemporary research reporting such an approach.

9.8.4 Chicago

Chicago’s Systems Thinking about the customer demonstrated an understanding of how and why a partnering arrangement worked. One of its directors observed:

“...both parties have to have the right head on if you like. And once they get to meet each other, it’s a bit like getting married really.”
The key point was that if Chicago approached its projects looking only for profit and/or Minnesota looked only for lowest cost, the relationship would fail. It meant that both parties had to Systems Think about how their behaviour impacted upon the behaviours of other parties involved in the programme (following Senge et al; 1990, 1994).

Chicago’s directors suggested that customers and contractors needed to understand that short term gains were available for departing from a partnering stance, but that those gains were not sustainable. One director stated:

...you have to have clients who know full well that if they went to the market to buy a linear metre of partition or whatever it is, they would be able to find it cheaper than using the delivery vehicle they’ve got, they’ve got to realise that. And equally the contractor has got to understand that he can’t have things all his own way...the essence of these things is trust.

Chicago’s overall culture and approach, therefore, was not only to deliver an excellent and timely customer service, but also only to work with customers who understood that this type of service comes at a premium price. It displayed a ‘customer comes first’ and ‘can do’ culture which required it to understand its customers’ needs. It was an interesting perspective which which it may be argued suggested that Chicago believed the norm within the industry was to be low customer focus, low service and low profit margin. Such a perspective appeared to align with Love et al’s (2004) position of customer orientation in the industry and suggested that his recommendations had not been fully adopted.

9.8.5 Dallas

Dallas had an understanding of the interaction between what some members of its customer organizations wanted and what others (who hold the budgets) could afford. This understanding suggested that Dallas had learned to Systems Think on behalf of its customers. In addition, Dallas understood that there would always be projects that would not turn out as hoped and/or projects where it could not live up to customer expectations. It understood that the best thing to do was accept that these were inevitable due to the unpredictable nature of the industry and to learn from the outcomes. The extent of Dallas’ understanding of its customers’ systems extended to its customers’ customers. As one of its directors observed:
"...one of the PMs walking through the car park and a woman says about getting a bag to the store and they'll get one of the labourers to carry her bags to the stores..."

The fact that Dallas saw this as differentiating behaviour offers a contrasting view to Love et al’s (2004) customer focus adoption.

In addition, Dallas helped to train and support its customers’ professional teams as it assisted Dallas to execute its role in a better way. It suggested that if the customer’s representative failed at his/her job, everybody on the project failed. Dallas’ directors suggested that such customer focus came from the individuals within the business rather than being an edict from management. One director stated:

"...we are very, very good at delivery and we are very committed to our customers. That’s done...that’s a personal will from the staff as much as it is a need for the business."

Such a customer process orientated approach is espoused by Dickson et al (2009).

It may be argued, therefore, that Dallas’ management systems had been moulded to and by its interactions with major customers, such as Washington. Dallas avoided the perceived weakness of larger members of its peer group of trying to impose a project management system upon the customer. Dickson et al (2009) noted the need for ‘process thinking’ when dealing with customer relationships. Dallas’ current approach had, however, not always been the case.

It was noted that some directors who managed the Washington commission used to take a more aggressive and contractual position than was taken today. The deployment of the correct personalities in addition to skills was something that Dallas was bringing to the fore. A member of the focus group observed:

"...one PM who is working on one job has sort of come up from the ranks so to speak and he is very good and focused. He's probably not as customer friendly as some people but he's ideal for a new build where you haven't got the customer interface."

Dallas’ senior management demonstrated its deep understanding of its customers’ strategies by giving a long narrative about what it understood those strategies to be and how Dallas’ actions directly or indirectly supported the strategies. This allowance
of access by such customers as Washington had allowed Dallas’ directors to develop with a real long term perspective of where it needed to be. One senior manager commented that:

“...Washington because they’ve got that long-term vision allows us to understand and gear ourselves. So we will sit at the meeting discussing the half year results with information from Washington’s about what they expect to give us next year...”

Dallas, it appeared, had taken Systems Thinking about the customer to the point that it may not be the best position for the organization itself. Nevertheless, its directors viewed this position as a key strength of the organization. A director stated:

“You can go to Dallas [location] Office and Dallas [location] Office, and you wouldn’t, beyond the flag, recognise anything about what they do or how they do it. Because there’s a general manager in charge of that office, who will marry his business as close as possible to the market surrounding him...”

Dallas’ approach appeared to be a cut down ‘workforce diversity’ approach as used by multinationals to adapt to the different business cultures they encountered (c/f Choy, 2007).

9.8.6 Kansas

Kansas demonstrated customer Systems Thinking behaviour by looking internally as to how it behaved in response to customer expectations. During the recession, some customers asked for deep discounts, but Kansas attempted to educate them that this was not a viable long term strategy from any of the parties’ perspectives. The MD stated:

“...all of a sudden [customers are] thinking "Hang about it’s sale time." So they’re going back to their supply chain going "I want it for this." And they know their supply chain to a certain extent is going to say "Yes." Because they want to keep the lights on in the building, so they’re doing it for that. But what they’ve done, they’ve broken the loyalty level.”

Kansas’ approach mapped almost exactly to Crosby’s (2009) advice to focus on long term gain over short term benefit in a recession.
Kansas was in fact looking to scale back its efforts to understand customers as it had started to note the cost-benefit of such an approach. It noted that having its own joinery division was actually a disadvantage in this arena due to the fact that it provided too many free product samples. Whilst this was an excellent way to understand its customers, as it did not get paid for the samples it began to realise that in many cases it saw no reward for such activity. Its MD noted:

"Once we’ve taken a client on he becomes part of a family for a better word. And we spend lots and lots of time with them, making sure they’re happy with what they’ve got. And sometimes the reward back in value, for a better word, it just doesn’t come..."

Kansas two positions suggested that customer Systems Thinking was only of value where it dealt with an educated customer.

9.9 Summary

Within this Team Learning chapter, as with the previous chapters 5, 6, 7 and 8 the analysis again came from all six nominated contractors. Again, not all discoveries in all contractors were analyzed against all Team Learning elements. This was again due to the differences in depth of demonstration of this LO discipline between the contractors. It is noted in the Conclusions, Implications and Recommendations chapter 10 that no one organization demonstrated all of the elements of a LO and that the analysis herein, again similarly to chapters 5, 6, 7 and 8 drew together the better examples in each Team Learning sub-section from the six contractors and contrasted them against each other and previous research.

This approach, whilst it provided what could be suggested to be a best practice example of the deployment of Team Learning within a contracting organization, provided a idealist ‘tapestry’ which does not represent the reality for any one organization. In addition, some points brought out where there are notable failings in the six contractors to adopt LO processes which provided a contrast within the analysis.
10 Conclusions, Implications and Recommendations

10.1 Introduction

The purpose of this chapter is to draw together the findings of the field research with respect to the research question noted in the section ‘Answering the Research Question’ below. The section includes a new proposed model of the LO that is considered to extend Senge et al’s (1990, 1994) model to best fit the construction industry. Additionally, some sub disciplines to Senge et al’s (1990, 1994) existing five disciplines are noted for inclusion in a construction industry model of the LO.

First piece of this chapter provides the reader with a summary of the project as undertaken in about a page. This is provided such that those who wish to simply read this chapter 10 have an idea of the work that has gone before. In addition, it provides those who have read the full document with a short reminder of the overall journey.

The second section of this chapter focuses on ‘Answering the Research Sub Questions’ which were posed at the start of this thesis and which needed to be answered in order to answer the main thesis question. These questions centred on understanding what excellent performance looks like to the construction customer and what types of organization(s) provided such performance. This section is in two parts.

The third section, ‘Implications for Business’, sets out a short series of recommendations for the construction industry. These recommendations comprise a set of practical applications for which the industry and organizations within it ought to consider adopting on the journey to becoming a LO. These recommendations are seen to make a significant contribution to construction industry practice. Whilst these recommendations are aimed at the construction industry per se, and have been developed as an outcome of the herein reported exploratory research, it may be argued that the recommendations could be adopted by other industries with similar operating models.

The fourth section offers a short note on ‘Delimitations of Scope and Key Assumptions’ followed by the fifth and final section on ‘Recommendations for Future Research’. It is hoped that these recommendations are adopted and taken forward by future researchers in the LO and/or construction industry, or similar, fields.
10.2 Summary of the project as undertaken

In order to bring the research to a close, this section sets out in abbreviated form: the methodology, and the methods deployed to answer the research question.

The research methodology was carried out from a mid-point between the nomothetic and ideographic perspectives. From an ideographic perspective, the research herein reported aimed to enter the everyday events of the organization in order to let the nature of that organization reveal itself. The initial phase of the research involved semi-structured interviews with customer organizations who declared an interest in the research itself. Of 30 major construction customer organizations approached, six agreed to participate.

During the initial phase of the research, the customer organizations identified a number of clear areas of excellent contractor performance. The clear position was that the standard output performance indicators of project completion to time, cost, quality, and health and safety were no longer indicators of excellent performance in the industry. These indicators were now the minimum performance required to satisfy the customer and there was seen to be a further suite of more behavioural measures which were the indicators of excellent performance. These findings were drawn together in a single model for procurement and performance management. At the conclusion of the interviews, the customers nominated one excellent performing first-tier contractor for case study.

The contracting organizations nominated as excellent performers fell largely into the ‘medium sized’ bracket of the construction industry. Indeed, some of the participating customers noted that the larger contractors were actually poorer performers at behavioural aspects of service delivery. The nominated contractors’ processes were examined against the Learning Organization framework provided in Senge et al (1990, 1994) to establish the extent to which recognized Learning Organization processes were being employed.

The use of the multiple case study approach used for the research into the contractor organizations themselves was employed so that identification and understanding of a few key causal LO processes could be obtained. As such, it never became necessary to expand the research to the point where an understanding of the workings of any one entire organization was obtained. The pragmatic approach of employing focus groups and interviews as the basis of the case studies was therefore vindicated as the correct one. The interviews and focus groups were augmented with the use of field
notes, observations and review of documentary evidence which brought a level of richness to the data.

10.3 Reflection on the Customers & Nominated Contractors

It is useful to reflect on the pairing of customer and contractor to provide an understanding as to the relationship between the two and how these provide insight into the way the organizations generate the behaviours observed during the research.

10.3.1 Oakland – Kansas

This was an interesting relationship from the perspective that Oakland gave the perception of being the most innovative and forward thinking of the customer organizations researched. However, Kansas displayed the fewest of the LO characteristics of all the contractors – at least for the purposes of the research behind this thesis. This conclusion is relatively easily drawn from the fact that in most of the LO disciplines discussed herein provide little discussion no Kansas’ processes.

Two conclusions can be drawn from this: either Kansas has other mechanisms at work which allow them to deliver excellent performance to Oakland, or that the research methods were not sufficient in Kansas’ case to uncover LO processes. Whilst it is beyond the scope of this thesis to draw such conclusions, it was an interesting observation to make as part of the learning journey.

10.3.2 Washington – Dallas

There was good alignment between the messages given to the author from Washington (customer) and Dallas (contractor) particularly in terms of the hand-in-hand development of the contractor’s organization. It was clear from the deeper research carried out into the contractor organization that the message was consistent through the teams and there was full understanding of Washington’s objectives. Dallas were clearly excellent at cycling learning for the benefit of Washington and the author came away with the impression that this partnership had many years future ahead of it. Dallas’ use of risk registers as learning tools was particularly interesting as this is something not generally done within the construction industry.

10.3.3 Miami – Indianapolis

Similar to the Washington – Dallas relationship described above, the relationship between Miami (customer) and Indianapolis (contractor) was actually slightly stronger and slightly more closely aligned. From the data gathered, Indianapolis
appeared to be the most innovative of all the contractors surveyed and its team appears to ‘live and breath’ the Miami philosophy. Given that both Washington and Miami are retail sector customers, it may be that this sector creates the best learning environment; but without a more exhaustive research piece with more participants from the same sector, this conclusion cannot be drawn.

It can be noted from the content of this thesis that Miami and Indianapolis appear more frequently within the text than the other pairings. This situation is reflective of both the excellent alignment between the two, but also the depth of the learning environment created. Miami uses its ‘Centre of Excellence’ specifically for the creation and sharing of knowledge, and Indianapolis ensure that all members of the delivery team learn quickly and deeply about what Miami requires as a customer.

10.3.4 Minnesota – Chicago

Given the status of Chicago being a single supplier to Minnesota, a better alignment of the language used by the customer and contractor was anticipated. However, Minnesota’s position was very much one of wanting excellent delivery of projects without being too worried about the mechanisms behind them. Chicago, however, was very clear about its vision and how this translated in continual learning and performance. Therefore, Chicago appeared to be the organization that had taken the greatest steps down the LO path without the explicit support and drive from a customer organization.

Chicago’s MD was probably the most visionary of all the contractor MDs interviewed for this thesis. It was clear that his strong vision was part of what made Chicago a successful supplier to Minnesota. In addition, it was clear that the Minnesota team shared that vision and were aware of the fact that they needed to continue to differentiate themselves from potential competition in order to retain their ‘sole supplier’ status. This awareness appeared to be the catalyst which drove Chicago to continue to innovate its service provision.

10.3.5 Houston – Tennessee

Houston as a customer, was quite broad about its definition of excellent performance with most categories discussed receiving a description of important or very important during the interviews. This situation could have meant that the work with Tennessee could have provided a equally mixed message about how it provided excellent performance, but it was relatively clear on vision and strategy and how to work with
Houston. In fact, this relationship between customer and contractor was interesting in that Houston made it clear that Tennessee did not perform best in its highest weighted KPI (cost of delivery), and yet was still considered to be best performer. This demonstrated how much customers like Houston had started to value performance factors above the traditional construction measures, like cost.

Tennessee appeared to have the longest commitment of learning of all the contractors in terms of time spent developing internal initiatives, but appeared to be less aligned to its nominating customer than the other contractors. This may have been due to Tennessee’s size and number of customers in comparison to the other nominated contractors.

10.3.6 Pittsburgh – Cincinnati

Given the embedded nature of Cincinnati within the Pittsburgh organization, it was unsurprising to observe a good deal of alignment and partnership between the two. Furthermore, the fact that Cincinnati was a JV set up specifically for the delivery of service to Pittsburgh should aid that alignment. Nonetheless, Cincinnati was not the only organization in this same situation and therefore it was able to raise its performance above that of its peer group. What was clear from the research in this area was that Cincinnati was seen as ‘contractor of choice’, from those within the Pittsburgh ‘Alliance’, for taking innovative steps with Pittsburgh’s programme of works. Having reached this position gave Cincinnati a further advantage, as long as it kept performing well in innovative areas.

What was not clear from the research was to what extent the learning would be recycled and maintained when the JV no longer existed. The larger parent company which supplied the ‘engineering’ element was better placed from a knowledge retention perspective. This was due to the fact that the works for Pittsburgh were predominantly engineering based and the construction works were to support the engineering element. The author is still very involved on a professional level with Pittsburgh and it will be interesting to observe as time progresses if, and how, such learning is recycled.

10.4 Answering the Research Question

The answers to the original research questions must be established. The overall research question was:
To what extent do excellent performing UK construction contracting organizations demonstrate and employ recognized Learning Organization processes?

From the case studies herein reported it became clear that, using Senge et al’s (1990, 1994) model, none of the organizations examined within this thesis could be construed to be a LO. However, each of the organizations, to a greater or lesser extent, had adopted some of the LO principles. What was also clear was that the nature of the construction industry required a much greater customer influence over the operation of the contracting organization than in some other industries. Senge et al’s (1990, 1994) case studies, for example, were drawn from a manufacturing base where the supplying organizations didn’t have the large reliance on a small number of customers. It may be argued, therefore, that what was needed was an extended model of the LO which supported the theory and also included the practice of the operation of the construction industry.

The above position was drawn from the observation that none of the case study contractors could suggest that they had processes and/or a culture in place to support all of Senge et al’s (1990, 1994) model. The conclusion must be viewed against a backdrop of the thesis author’s interpretation of the LO model, particularly given the critique of the model as “…anything goes…” (c/f Ortenblad, 2007). There was seen to be, however, a clear uptake and embedment of some of the principles, which were demonstrated by the results reported in the previous chapters. In addition, it may be proposed that there were some clear additions and amendments to the LO model emerging from the construction industry. Although such additions and amendments were not seen to be unique to the industry, they were certainly considered to be necessary when applying LO theory to the construction industry.

10.4.1 Findings and Emergent Models – Amendment of the LO with respect to Senge et al’s (1990, 1994) model

Barlow & Jashapara (1998) suggested that partnering and collaborative arrangements were often instigated by customers and that customers potentially should spearhead the move towards a LO supply chain. Chan et al (2005) critiqued this position, suggesting that Barlow & Jashapara’s (1998) proposition was a dangerous assumption without further research to confirm it. In addition, Chinowsky et al (2007) touched upon the journey from KM to LO being partially at the behest of the customer within the construction industry.
However, the research herein reported may be seen to suggest that the position of customer involvement in the operation of first tier construction contractors had advanced from the aforementioned positions. Contractors possessing long term partnering and collaborative arrangements with their customers were not only taking their lead from the customer for the relationship but also were actively allowing their customers to guide the strategic growth of their organizations. This guidance ranged from the expansion of service provision right through to assistance with geographic expansion.

Furthermore, customer support was considered necessary due to the construction industry model of the customer being more involved in the design and construction phases of their product coupled with the fact that a single construction customer can represent a large volume of their contractors’ turnover (up to 20% was not uncommon). Furthermore, the low contractor profit margins driven by a lowest price tendering culture (often 2-3%) left little money for internal investment (Egan, 1998; Latham, 1994). The support of an informed customer who did not use a lowest price tendering process was therefore necessary.

In addition, there was evidence that first tiers Contractors were importing business processes directly from their customers. Such behaviour may be seen to suggest that LO contractors may be learning to be an extended part of their own customers’ organizations. The behaviour was reminiscent of the rollout of Lean techniques in the manufacturing industry where organizations such as Toyota adopted lean processes internally and then rolled these out through their supply chains. The final result of Toyota’s actions was that almost all of the automotive manufacturing supply chain was working with the same lean processes. It might be in the future that the relationships in the construction industry move towards a standardized approach similar to the automotive manufacturing industry.

It may be argued, therefore, that the LO research positions of Barlow & Jashapara (1998), Chan et al (2005), Chinowsky et al (2007) and Senge et al (1990, 1994) need to be extended. The customer may be considered not only as an advantage to creating an LO in the construction industry supply chain, but also as an essential element of a LO. For the purposes of this thesis, an extended LO model was considered as follows.
This extended LO model adapted Senge et al's model (1990, 1994) and extended the five disciplines. The model may be seen to demonstrate Systems Thinking encompassing the other four disciplines. Furthermore, it may be seen to include a sixth external discipline of customer support. This discipline was seen to be essential to the other five by encompassing Senge et al's model (1990, 1994) in its entirety.

The research herein reported was considered to have uncovered further extensions to the LO model which may, or many not, be unique to the construction industry. It may be argued that these elements should be included as elements of the first tier construction contractor LO model immediately. In addition, it may be suggested that they are further researched for presence within other industries/cultures. The suggested extensions are noted below:

10.4.1.1 Mental Models

There were no additions to this element of Senge et al's (1990, 1994) model as by its very nature, changing Mental Models was seen to be about changing assumptions behind any existing model in order to challenge it. The items noted under this section
were seen as clear examples of innovations which demonstrated changing Mental Models within the construction industry.

Construction organizations were seen to be changing the mental model of ‘defects liability’ to one of ‘after sales service’. The concept of after sales service and managing defects was a concept well established in other industries (Bundschuh & Dezvane, 2003). The traditional view of defects as a necessary evil of construction (Egan, 1998; Latham, 1994) has long been critiqued. The change in terminology and in mindset was seen as an innovative way of minimizing the impact of defect liability upon the customer and therefore his/her view of the value of the contractor’s offering.

Construction organizations were trying to make their projects attractions rather than inconveniences for their customers. This altered Mental Model was especially useful within the retail industry where the contractors’ customers dealt directly with the public who were most likely to be inconvenienced by a project on a live site. The consideration of making the project in some way a novelty to the public through various visual and interactive aids demonstrated a shift in the mental model that the project was an end in itself. Contractors were starting to understand that their customers’ businesses were the ends which the project was a means to support.

Construction organizations also were starting to view their understanding of construction and the customer’s business as an opportunity to change their offering to incorporate consultancy style advice. Such an understanding of the link between contractor business offering and customer business offering provided a powerful knowledge base upon which contractors could assist with decisions that stretch far beyond the project itself. Such behaviour was a further example of the contractors’ new Mental Model that the project was simply a means to a further business end.

**10.4.1.2 Personal Mastery**

Construction Organizations were starting to look for cultural and learning alignment within their supply chains. Such a yearning was similar to the approach taken by Toyota in the rollout of ‘Lean’ which Toyota fully expected its supply chain to embrace. Therefore their employees and those of their supply chain would work towards a level of Personal Mastery together. For such an approach to be adopted wholesale in the construction industry would require a significant cultural shift.
The operation of Personal Mastery was clearly different in smaller construction organizations which relied on the flatness of the structure to support idea generation and implementation. Whether this difference confirmed the presence of Personal Mastery within such organizations as a natural phenomenon, or whether it suggested that there was no need for Personal Mastery within smaller organizations was seen to be a matter for future research.

To allow Personal Mastery to flourish, there must be alignment between how the organization, and the individual, viewed ‘failure’ and its consequences. This concept was not one which Senge et al (1990, 1994) or more recent writers made explicit, but a lack of such alignment might stifle Personal Mastery if the individual did not possess understanding of the alignment. The fact that the industry was becoming willing (and able) to admit mistakes without the fear of legal action was relatively new in the industry and a departure from previous research (c/f Rooke et al, 2003). Linking the two concepts in this paragraph suggested that the environment for Personal Mastery to flourish may be present in the industry.

10.4.1.3 Shared Vision

Excellent contractor ‘new starter inductions’ which included customer values and goals which aligned the culture and vision of the contractor with their customer were seen to be a new process. Such a process not only fuelled the Shared Vision within the contractor organization, but also allowed for Shared Vision between the contractor and customer. Customer interaction assisted in the development of Shared Vision, which further strengthened the alignment of vision between contractor and customer. A widening of the Shared Vision principle was considered to be an extension to the current LO model (Senge et al; 1990, 1994).

The contractor who adopted a ‘family’ style culture was seen to demonstrate a clear enabler to the construction LO. The concept of a family culture within an organization was an under explored one which appeared not to feature prominently in Senge et al’s (1990, 1994) work nor the later research. It may be argued that such a concept requires further research as consideration to being an extension to the LO model. For the purposes of this thesis, it has been included as an enabler in the creation of the Shared Vision, but further research may better place it elsewhere within the LO model.

Empowerment as an intervention for ‘any employee’ in the process was starting to occur which was seen to be similar to the ‘Lean’ model deployed by Toyota. The
principle of empowerment within the LO has long been critiqued (Symon, 2002) as being an unrealistic utopia. The reality was seen to be that non-management simply became the monarchs over unimportant decisions. The concept of those working within the process being able to halt or alter it mid-flow was perhaps a mid-step between having all workers involved in all decisions and having them manage unimportant ones.

10.4.1.4 Team Learning

The use of the risk register and process as a Team Learning tool appeared to be unique to the construction industry LO as it appeared not to be mentioned in any other LO literature. It may therefore be argued that the incorporation of risk management as a Team Learning tool could be adapted into the LO model. How exactly this tool best fits may be considered as a subject for future research.

10.4.1.5 Systems Thinking

Organizations needed to understand that what the customer wanted was not always innovation. Sometimes just an excellent standard of service was required. Senge et al’s (1990, 1994) work did consider the customer to a reasonable extent, but what it appeared not to deal with was where learning should be focussed in terms of identifying directions for innovative customer service and excellent standard customer service.

There was a clear willingness for individuals within excellent contracting organizations to take a temporary step down in role in order to maintain service to the customer. Such an approach belied a potential lack of organizational politics within such an organization. A key criticism of Senge et al (1990, 1994), which may be considered to require further research, was that the LO model did not adequately deal with, or allow for, the presence of organizational politics.

Excellent contractors were providing appropriate challenges to perceived poor customer decisions. Where challenge was not possible, information on the implications of such customer decisions was provided instead. Contractors were able to think like the customer when interacting with the customer’s stakeholders and customers. Such interaction appeared to be an omission from Senge et al’s (1990, 1994) model. The extension of contractors’ organizational learning beyond the confines of the contractor organization and into the customer organization could be the next extension to the LO model.
In addition, there appeared to be a clear understanding of the long term effects of taking on more work than the organization could successfully deliver. Whilst this position was a central tenet of Senge et al’s (1990, 1994) LO model, it was not usual behaviour for a construction contractor. Latham (1994) and Egan (1998) noted the industry’s propensity to place growth of turnover above quality. It was therefore worthy of note that excellent contractors were applying Systems Thinking in this area to good effect.

10.5 Answering the Research Sub-Questions I

In addition to the main research question, a series of ‘enabling’ sub-questions were proposed. These questions needed to be answered in order to answer the overriding research question or to give the answer to the research question a contextual background. The first two of these questions were:

- What do customers recognize as excellent performance from their first tier contractors? And
- What criteria may be used to identify those who provide better service?

The research herein reported discovered an updated framework which answers the above questions and has potential implications for how the construction industry and its customers interact. That framework is now discussed.

10.5.1 Findings and Emergent Models - Excellent performance from the perspective of the construction customer

10.5.1.1 Performance Management

Following on from the research herein reported, there needs to be a paradigm shift in the way in which the industry measures and manages its first tier suppliers. The research suggests that customers should expand their performance management beyond the use of output KPIs. Customers who keep extensive output KPI suites may have to reduce these in order to incorporate the following input measures. The framework to be able to measure such areas is suggested as an area for future research.

Emotional commitment and ownership of the programme. Top management commitment is an intangible quality provided by the better contractors which is difficult to measure in any clear way. Construction customers need to purchase first tier contractor management capability in addition to technical capability. The

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responsibility for the delivery of a construction programme can thereby rest with the first tier contractor rather than the customer. Coupled to commitment needs to be an appropriate level of EI as suggested earlier in section 4.2.2.2. EI is defined by Palmer et al (2000: 5) as "...how effectively one deals with emotions both within oneself and others..." Such intelligence is viewed as a key input factor in creating excellent performance as the contractor can better align themselves to their customer.

**Effective two-way communication.** Contractor performance improvements can be a function of good dialogue between customer and contractor. A detailed engagement is necessary to establish long term development plans between contractors and customers to achieve the goals of both organizations. Creating a formal alliance with their first tier contractors involves communication at many levels. Effective and consistent communication is taken for granted within alliance/partnership relationships; with the ability of the contractor to listen actively being a big differentiator. The importance of the ability to listen actively, which may be defined as "...a dynamic process that can be broken down into three different behaviours: paraphrasing, inquiry, and acknowledgment..." (Bordone, 2007:9) is not something reported in recent contractor performance literature (Yeung et al, 2008).

**Contractor developing their business to align with the customer.** Customers are looking for attitude and behaviour as the key deciders when they are aligning with contractors. There has been a departure from hiring on pure competency as customers understand that with the correct attitude and behaviour, competency can easily be developed. Customers are actively looking for contractors who come to them with these qualities already demonstrated. This requirement is becoming evident in customers’ hiring of first tier contractors, as the questions being asked are beyond the traditional procurement question of ‘how many similar projects or programmes have you delivered?’ Obviously this question is still important, but without the right attitude and behaviour, it will not carry as much weight in the current market place. The extension to the previous research (Chan et al, 2006; Kagioglou et al, 2001; Lam et al, 2007) is that excellent performance in attitude and culture is simply about organizations keeping their promises.

In addition, this concept of alignment has extended to customers assisting their contractors with their own business development. Some customers are actively leading their excellent contractors into new geographic areas and/or towards executing projects slightly beyond their field of experience. This position suggests
that customers are becoming more active in the management of their construction supply chains and helping their excellent performers to grow.

**Effective and appropriate challenge of customer decisions.** Customers realize that contractors who act as ‘yes men’ (sic) when the customer is making an obvious error are not providing excellent service. Contractors still, however, must be wary of trying to dictate what should be important to the customer. The allowance of such a challenge is another move towards the model of contractor as consultant; by assisting the customer to deliver what is important without making a mistake whilst so doing.

**Commitment to constant dissatisfaction, at the business and programme levels.** Satisfaction is viewed by customers as a journey with perhaps no ultimate destination, similar to the approach to becoming an LO (Senge et al; 1990, 1994). Excellent contractors are those who know that no matter how well they have done something, they should always be dissatisfied with it and look to perform better next time. This is not to suggest that customers wish their supply chain members to be unhappy in themselves.

**Transparency of business performance.** Customers wish to work with contractors who are honest about their strengths and weaknesses. Contractors also must have a clear strategy for improving these areas.

**Consistency of attitude, behaviour and culture.** ‘Business personality’ might be another way of describing this performance criterion. A truly consistent business personality manifests itself as a consistent message given out by the business leaders of first tier contractors and those who are engaged to provide service to the customer. Customers who take on first tier contractors based upon strategic messages about what/how that contractor can deliver require the same message to be spoken by those delivering.

**Delighting the customer’s stakeholders.** Contractors must safeguard their customers’ reputations through appropriate interaction with the customers’ stakeholders. This criterion is especially important if those stakeholders are the buying public, even more so if the interaction is in a face-to-face environment, such as high street retail. Contractors must therefore understand their customers’ businesses well enough to be able to handle that interaction to the same standard as the customer him/herself. What customers require is a contractor who will act as if
they are an extension of the customer’s own organization and maintain the same pride in their business.

**Protecting the customer’s business from the impact of construction.** The minimization of the impact upon the customer’s business of the programme of works themselves is not one which appears to emerge in recent research to any great extent. Chan & Chan (2004) and Atkinson (1999) discuss the positive impact of the finished product upon the customer. These positions can now be extended to include the ability of the contractor to minimize impact on the customer’s business of the construction programme. It then follows that contractors need to have a good understanding of the customer’s business.

**Flexibility and responsiveness to programme change.** Flexibility and agility are elements that cannot be delivered immediately and a period of time is required between a customer change in message and the change in direction from the contractors. If a customer explains what needs to be done differently on a programme, they expect contractors to be able to respond within a reasonable timeframe. Flexibility and agility are also required in order for the contractor to be able to flex successfully to the ebb and flow of work during a long programme of construction works.

**Focussed innovation and learning with tangible outputs.** Innovation is a way that the contractor can add value to the construction process that is beyond the contract or project specification. It can be viewed as a key differentiator which does not always have its own KPI, such as the ability for the contractor to think on their feet when encountering issues on site. Alternatively, innovation can manifest itself as being able to give input at the design development stage which assists in designing out waste at a project level. This position would extend the research of Beatham et al (2004) and Kagioglou et al (2001) suggesting that innovation cannot simply be measured in financial terms.

**Summary**

Customers ought to develop a framework around these aforementioned performance criteria in a way that best suits their business requirements. The results element of this thesis provides an in-depth recommendation of a starting point for a best-practice model. It is accepted that this model will require a certain amount of deeper thought and preparation than a simple output KPI suite. The extra effort, however, would be more than repaid in terms of the customer being able to better manage the
contractor in driving the required behaviours. There would be no room for ‘box ticking’ in order to achieve KPI measures at the expense of what may really be important to the customer. Many KPI suites currently in use suffer from such issues, such as the earlier example of targeting numbers of defects rather than the ones important to the operation of the customer’s business. Furthermore, it would alleviate the annoyance of contractors who do end up harming their own KPI scores by focussing upon what they know is really important to their customer.

These new best practice performance management factors can, if necessary, be measured quantitatively, but the more important issue is that they are identified and proactively managed. If these factors are to be measured as an ‘input KPI suite’, then the customer will need to define exactly what behaviours s/he needs to demonstrate under each one. The required behaviours will have to be clear enough to be adopted and followed and be focussed enough that improving them will add real value to the customer’s programme. In this way, areas which delight customers will be managed alongside those which simply keep them satisfied, as tends to be the case with most quantitative output KPI suites.

It is suggested that these input factor KPIs are updated quarterly as part of a managed performance improvement programme. Performance improvement initiatives can be put in place to support and improve each of the behaviours. This approach is recommended as a long term strategy for performance improvement that will progress the contractor businesses at the same time as driving excellent performance to the customer. The customer and the contractor should work together to establish the finer points of the required performance and when the performance level should be reached. The initiatives can then be crafted to achieve the required level of performance and this performance level can be a further measurable item.

In addition, output KPIs will be improved through the management of the excellent performance inputs. Driving longer term improvement at the input level is more likely to drive a sustained improvement in outputs than trying to manage the outputs alone.

Contractors themselves need to start examining themselves on the basis of these performance factors. They need to examine to what extent they are providing them for their customers and what they could do to improve their performance in these areas. The arguments here presented could serve as an initial guide as to what contractors should be focussing upon proactively. More customers are becoming more
educated on the construction delivery process and becoming more exacting about what they want from their supply chain. Therefore, contractors who can demonstrate that they are becoming more educated in these areas too are likely to outperform their competition.

10.5.1.2 Procurement and Engagement

In addition, there needs to be a shift in the way in which the industry procures from, and engages with, its first tier suppliers. It is therefore suggested that the presence of the aforementioned behaviours are examined in depth by customers procuring for large programmes of works. Such an examination should be carried out in enough depth for the customer to satisfy themselves that the necessary supporting processes are part of business as usual within a contracting organization. The identification of these supporting processes is seen to be an area for future research and not covered further within this thesis.

At this stage it is recommended that these processes should not be left to the contractor to demonstrate in presentations or documents. The customer should actively be researching the contracting organization to identify their existence. Such research should involve, but not be limited to, interviews with the business leader(s); interviews with the proposed contractor lead for the customer's programme of works; a focus group with some of the contractor's team who will be working on the customer's programme of works; an examination of the contractor's written processes; the observation of one of the contractor's senior management meetings; and a questionnaire to a cross-section of the contractor's employees.

This approach is recommended as the customer can more easily establish whether their prospective partner possesses the characteristics described as excellent performance within this thesis. The more in-depth approach would replace the 'tender document and presentation' approach currently favoured by many customers. Control of the process would pass from the contractor, who currently controls what is put in the tender document and who attends any presentations to the customer, to the customer.

Furthermore, this method of tendering would enable the customer to gain the understanding of how their contractors' businesses work. As stated earlier, such an understanding assists the customer in engaging with, and managing, their contractors. Such an approach would require a greater investment of time and money from the customer at the tendering stage. It is likely, however, that this approach
would produce better returns on investment across the life of the construction programme.

### 10.6 Answering the Research Sub-Questions II

The next sub-question was:

*Which first tier contractors currently provide excellent performance?*

The research herein reported discovered a commonality within the organizations nominated for research. This commonality aligns well with a comment made by one of the customer participants during the research. The comment was that during this customer’s journey to acquiring the supply chain that it currently had, it had noted (albeit without research to back it up) that the best performers were those who had less contact with wider market sectors. It was particularly noted that, somewhat counter intuitively, less innovation and ideas came from contractors with access to wider sectors than did those who were focussed on one or two sectors.

It was noted that of the six contracting organizations nominated as excellent performers, four were specialists in the region and or market in which they operated for their customers. That is to say, they focussed almost entirely on one or two sectors and/or regions. One of the other organizations was a JV set up entirely to service their particular customer, but consisting of parent organizations with a focus on the sector.

There is a clear topic for future research in this area to discover why larger contracting organizations appear to be less successful in bringing ideas and innovation to their customers than their smaller customers. Given their access to wider markets, it might be theorized that such large organizations would have interaction with processes/services which when transposed from one customer to another might represent innovation from the customer’s point of view. Therefore there is benefit to researching why this might not be happening as well as it might.

### 10.7 Implications for Business

It is clear from the research reported in this thesis that the definition of excellent contractor performance in the UK construction industry has undergone a shift. In order to be able to outperform their peer group, contractors must work to understand exactly what out-performance means to their customers. Once they have such an
understanding, there is a need for the organization to learn how to deliver such performance, and continually to maintain and improve that performance.

An understanding of the impact of the adoption of the processes herein described on the construction organization is important. This section addresses the implications that were seen to emerge from the study for the ways in which contractors can work to enhance performance from the customer perspective through the use of LO processes. Based on the model developed in the ‘Answering the Research Question’ section above, there is a need for contractors to engage more closely with customers and work with them to develop LO processes to the advantage of both parties.

In order for contractors to gain a clear understanding of what excellent performance means to their customers, contractors must take the lead. To do so, they must develop a clear understanding of what of the performance factors discovered herein are important to the customer and make improvement in these areas their target. In addition, contractors might be able to assist in the development of KPI suites to measure and communicate required behaviours to the supply chain. The movement of the contracting organization from being an organization that carries out construction works towards one that takes ownership of its role, understands the customer, and acts as quasi-consultant, requires such proactive assistance.

Conversely, it has become clear that the customer must also act proactively in driving and supporting the move towards LO in its contractors. The model of the construction industry in which the customer has greater control over the manufacture of his/her asset than in most other industries requires the support and even lead of the customer for the contractor to be able to change culture. In addition, the ‘lowest tender wins’ culture prevalent within some customer organizations precludes contractors from having the continuity of work to be able to develop LO processes and learn what excellent performance entails.

It is important that customer and contractor employees do not maintain existing attitudes whilst paying only verbal support to the move towards a LO. Such behaviour would obstruct the industry’s potential move towards a widespread adoption of LO processes. The perceived lack of trust of their supply chain by some customer organizations must be addressed if the necessary culture change is to occur. Specific learning and development programs should be designed and developed to meet this need.
Senior managers in contracting and customer organizations need to comprehend the importance of a mutual understanding of excellent performance and the need to support the provider in putting in place processes to achieve excellent performance. They need to be briefed on the importance of their role in supporting their respective organizations in the development of new learning, an expectation that must be made explicit in their own role specifications. In addition, leaders of contracting organizations need to be prepared to motivate and support their employees staffing the transition towards full LO status as part of continuing individual development. This altered management role is likely to require an upgraded skill set to enable these leaders to perform the new part of their role.

There is the opportunity to make the practical guidance within this thesis part of the national agenda for improving the performance of the construction industry. Bodies such as ‘Constructing Excellence’, which is made up of like minded individuals dedicated to the advancement of performance improvement through the use of such vehicles as collaborative working and the adoption of ‘Lean’ principles, would be an ideal vehicle to engage contractors, consultants and customers alike in the move towards an industry founded upon LO principles.

### 10.8 Contributions to the author’s professional practice

The personal journey undertaken by the author in the research and writing of this thesis has added to his own professional practice. There have been three notable areas where interaction between the author and those organizations which were researched for this thesis. It is anticipated that through these interactions, and through receiving copies of transcriptions and related articles, that the research behind this thesis assisted them in their LO journeys. Two of the customer organizations (Oakland and Washington) are using the outputs from this thesis in order to amend and improve the way in which they interact with, and manage, their supply chains. In addition, other customer organizations which have come into contact with the research are in discussions with the author about how the outputs may be applicable to their particular delivery models. The author is supporting those organizations at the time of writing in improving the learning capability in their supply chains.

Secondly, it is known to the author that the article published from some of the research undertaken for this thesis, namely Butcher & Sheehan (2010), will be used by the organizations to better link excellent performance from the perspective of the
customer with service provision from the contractor. The paper, and the award which it received from the Global Innovation in Construction Conference 2009, is included in Appendix C. Further to being presented at the conference and being published in a recognized journal, this article has been employed internally within the author’s organization for presentation and training purposes for identifying excellent contractor performance from a customer perspective.

Thirdly, from the research work done behind this thesis, the author has moved his personal area of interest through learning and on into the implementation of business improvement. The author is, at the time of writing, moving further into research, writing about, and practicing Lean behavioural change for organizational performance improvement. The LO concept is a key foundation of Lean behavioural change, sue to the need for organizations to unlearn previous methods of working in order to embrace new ones. Some of the organizations which were party to the research behind this thesis are now members of an ‘Intelligent Construction Customer Forum’ which is chaired by the author. This forum was set up for the exchange of knowledge between customers in the fields of learning, Lean and behavioural change within the supply chain.

10.9 Reflections on changes in the research

As this research progressed from the initial scoping paper into the fieldwork, there were two major changes in the methods employed. These are noted for summary below:

10.9.1 Change in research approach away from a ‘comparative’ study

During the course of the research, it became clear that the questionnaire element of the proposed case study work had become redundant. The amount of information gleaned from the interviews, case studies, written documentation and field observation gave the author more than enough understanding of the presence and operation of any LO processes. Given the wide range of personnel to whom the author was exposed, the extent and depth to which the processes went became clear. In addition, the author was able to gain an understanding as to the depth (or otherwise) of the commitment to these processes and whether and how they impacted upon the way the contractors served their customers.

It was originally intended that the herein reported research explore the difference between the processes employed by excellent performing and poor performing
contractors. This exploration was intended to further demonstrate that the presence of certain processes improved the performance of one contractor over another given that both worked on the same customer’s programme of works.

It quickly became apparent once the research was underway that this approach was flawed from two perspectives. Firstly, customers almost without fail noted that poor performing contractors were generally not retained on their programmes and therefore their supply chains tended only to range in performance from adequate to excellent. Secondly, it was realized following discussions with customers that poor performers tend to have several warnings before being removed from service. Therefore anyone under such a warning who was nominated for study would be likely to know that they were not being nominated for excellent performance and therefore might be unlikely to agree to be part of the research process.

10.9.2 Change in Oakland’s nomination of excellent contractor

During the course of setting up the case study work, there was a setback to the research. The alliance of six small contractors being treated by Oakland as a single contractor was hit by two setbacks caused by the 2008-09 recession. Oakland’s investment declined to almost zero in a matter of weeks following the worst of the financial crisis in late 2008. This cutback, coupled with similarly drastic reductions in investment from other customers, actually sent one of the six into administration. At the time of commencing the case study research it appeared likely that a maximum of four of the original six would remain working for this particular customer by the middle of 2009.

The administration of one of the contractors dissolved the alliance of six. Furthermore, the impact of Oakland’s spend reduction upon the other five was also somewhat ruinous. For four of them, Oakland represented over 20% of their turnover and effectively losing just this work had a drastic financial impact. These four also lost work from their other customers in the same way as the one who went into administration.

This change of situation presented several options to progress the study. Firstly, as the organizations were effectively (at least temporarily) independent rather than the alliance of six as originally nominated they could be viewed as no longer being the same nominated vehicle and abandoned entirely as subjects for this research. Secondly, the case study on them could be placed on hold until the customer had gone through the process of evaluating which contractors would be retained and the
case study carried out on the new alliance. Thirdly, individual case studies could be
carried out on some of the remaining five organizations.

Each of these approaches had their advantages and disadvantages. Abandoning this
part of the research would be the approach which kept most closely to the premise
that only contractors nominated as excellent performers would be researched. It
would however, reduce the amount of data acquired and would mean that the
customer who first inspired the idea for this research would no longer be a part of it.
Placing the case study on hold would also be close to keeping the research criteria as
close to those envisaged at the start of this work. This approach would, however,
leave one element of the research with an open and uncertain timeframe and thus
jeopardize the completion date of the entire work.

The approach of carrying out an individual case study was eventually decided upon. It
was accepted that the contractors were not nominated as individuals, but as a group.
It would therefore have to be accepted that the approach had the potential to corrupt
the research result. However, the LO processes which the group potentially
possessed could still be examined through the individual organizations. Indeed, there
was the potential to examine how these had permeated the organizations individually
and enabled them to improve themselves as individual performers in the wider
market. Therefore the Oakland nomination changed from its alliance of six to one
contractor, Kansas. It was decided to proceed with the case study on this one
contractor following a discussion with the customer in question. Oakland accepted
that this contractor on their own was an excellent performer and the fact that it was
the best of the six at being able to weather the financial storm suggested that it
might be the best at ‘flexing’ against market changes – one of the indicators of
excellent performance.

10.10 Delimitations of scope and key assumptions

The most obvious limitation of this research is that it is based upon the UK
construction industry only. This limitation raises the quite pertinent question of
whether the results, or indeed methods, are replicable outside the boundaries which
have been set in this thesis. From recent observations, the UK construction industry
remains a highly-fragmented contract-driven industry despite recent attempts to
change its nature (Egan, 1998; 2002). As such, the research may not be relevant to
industries which do not have similar restrictions.
In addition, there are internal limitations to this work. The argument has been that best-practice LO processes are the key factor in determining performance from the customer’s perspective and those processes are what was investigated. It may be, however, that other factors not addressed in this research may have a significant impact upon contractor performance. Those factors may have been mentioned during the data gathering process but may not have been identified in the coding process of data analysis. Such an omission has been seen as a key risk to manage with pre-coding of qualitative research (Miles & Huberman, 1994) and must therefore be recognized.

Furthermore, as excellent performance is defined through contemporary literature and a combination of customer interviews, there is the potential that this research becomes too generalized and may not fit many organizations’ specific models and definitions of performance. It is also anticipated that this research may be of little benefit to those employing largely SMEs in their supply chain as the research focuses upon larger contractors. By their nature, the larger customers are more likely to employ larger contractors more able to handle bigger volumes of work. Garcia-Morales et al (2007) argued that some studies on large organizations cannot be easily mapped onto SMEs and it has to be accepted that this may be a limitation of the research herein reported.

The limitation set out in Raiden & Dainty (2006) also is accepted. Raiden & Dainty describes the construction industry organization as a chaordic entity. As such, the organization may fluctuate between chaos and order which may make the identification and documentation of processes complex. Such complexity also needs to be acknowledged.

In terms of limitations against the LO model (Senge et al, 1990, 1994), it was noted in earlier chapters that this thesis was not able to examine the presence of ‘undiscussable’ items within the contractor organizations. The reason that this element was not examined was due to the in depth approach which would have been necessary within the case studies in order to uncover such deep rooted cultural issues. For the sake of practicality and time, such depth of research was not entered into and this remains an element for potential augmentation to this thesis.

The key assumption here is the concept of the LO itself. This concept has been debated since the term came to prominence in the two seminal texts on the subject, namely Argyris & Schon (1978) and Senge et al (1990). There is debate within
various recent papers around whether an organization can learn at all (c/f Love et al, 2004; Holt et al, 2000). The crux of the argument against the concept of the LO is that only an individual can learn and the organization does not exist without the cognitive reasoning of individuals.

In this thesis it is argued that there is no LO without individual learning, but that the processes involved in individual learning are different from Organizational Learning. A LO is most obviously identified through changes in culture which individual learning alone cannot create (Love et al, 2004). Therefore, the changes in the organization are greater than the sum of the individual learning carried out. It is also the case that the structure of an organization can affect the individual's ability to learn. Environmental turbulence, rigidity of organizational structure, adequacy of the organization's strategy, and its strength of culture can all affect the individual (Holt et al, 2000). This duality of influence is satisfactory to establish that there is a good case for the existence of the LO. Here it is not the intention to provide further insight into this debate. The assumption throughout this work is that the LO and the organization per se are constructs in their own right.

10.11 Recommendations for Future Research

The process of carrying out the research for the purposes of this thesis has uncovered a number of questions pertaining directly to the subjects of excellent contractor performance from the customer perspective and the LO in the construction industry. Each of these questions is beyond the scope of this thesis, but are worthy of further study to enhance the direction of study here reported. Each of these further research areas is set out briefly below.

Does the ownership model influence the organization's willingness to invest in the journey to LO? This question arose almost as a side quote during the contractor case studies. It does not have a direct bearing upon this thesis, but represents an interesting question as to whether owner-managed organizations are willing to invest in the processes required to work towards LO status. The question is pertinent as the journey may only start to bear fruit after the owner has sold the organization and therefore he/she may not directly benefit, although his/her successors may.

Why do larger contracting organizations appear to struggle with innovation transfer and appear less likely to provide excellent customer service? The question here comes from the observation of the customers involved in this thesis
research of the outward appearance of a lack of such processes. Therefore, it is suggested that there is merit in discovering what is the cause of this perception; and whether there is a model which could be developed to alleviate such a customer perception.

**Is there a need for an SME to plan to be an LO, or is the fact that individuals are likely to interact more frequently and be closer to customers create a LO environment naturally?** The appearance of the smaller organizations within this thesis research was that they possessed few formally operated processes and therefore suggested that much of their learning and flexibility occurred ‘naturally’. This position suggests that there might be a naturally sized ‘tipping point’ where an organization needs formally to address LO processes, which might differ between industries and types of organizations. Therefore, it is suggested that there is merit in investigating this phenomenon per se and developing a model such that organizations can identify and manage this ‘tipping point’.

**How does the concept of the ‘family atmosphere’ referred to by so many participants assist in excellent performance and/or the presence of LO characteristics?** Given the frequency of the occurrence of the phrase ‘family atmosphere’ during the field research into the contracting organizations, there is a clear opportunity to understand and model this concept and map its impact upon the concept of the LO and organizational performance. In addition, it would be useful to understand to what extent organizations with such a culture cope better in times of adversity, such as the prevailing recession during the time of this thesis research.

**How can existing accepted construction industry tools be adapted for use such that they can support LO processes, leading on from the example of the risk register noted herein?** It is clear from this research that the adoption of LO processes within the construction industry can be supported through morphing the existing accepted processes and adapting them to support LO culture. There is clear merit in investigating whether any other incidences, or potential incidences, are occurring across the industry. The example noted herein was the use by Dallas of the standard construction risk register as a learning tool.

**How can the excellent performance indicators discovered herein be developed into a useable suite of KPIs and measures for use by construction customers?** There is herein a suggestion of excellent performance areas which customers should be measuring as part of their management of construction
programmes. There is, however, a need to develop a framework for carrying out such measurement so that it might be developed into an operable set of KPIs.

**Do the extensions to the LO model discovered herein, such as the requirement for customer involvement, exist within other industry areas?** It became clear during the course of the research undertaken for this thesis that the journey to LO for the construction contractor requires the support and involvement of the customer. Given that many of the contractors had three or four individual customers which accounted for a large proportion of their business, it was sensible for them to align with these customers to preserve workload. It would therefore be valuable to discover whether this extension is necessary in other industries where the same near-monopsony buying situation prevails. If an extended LO model is indeed necessary, this represents a possibility for there to be an enhancement and extension of the LO theory set out by Senge et al (1990, 1994).

**Is the rejection of ‘excess’ turnover in favour of excellent performance on a ‘manageable’ turnover an increasingly adopted strategy in the contracting industry?** Given the poor condition of the construction market at the time of the research behind this thesis (reducing workloads and margins with concomitant redundancies etc); such a strategy might be unrealistic. However, it is worthy of future research whether such a strategy could be (and is being) successfully deployed during more buoyant market conditions as a longer-term contractor growth/profitability strategy.

**Why is a ‘true’ understanding of the customer’s customers and customer’s processes and the demonstration of real Systems Thinking in this area not a key performance indicator in the construction industry?** Given the potentially huge impact that construction-project-level decisions can have on stakeholders and processes, it is interesting that none of the participants referred to a KPI or contractor selection criteria which mentioned this area. However, almost all of the customer participants interviewed for this thesis stressed how important such thinking was from their supply chain. There therefore is scope for research into this apparent paradox and a solution to it.
11 References


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12 APPENDICES

Appendix A: Informed Consent Statements

Appendix B: Questions Used in the Contractor Case Studies

Appendix C: Conference Paper and Award
Appendix A: Informed Consent Statements
Dear xxxxx,

Thank you for agreeing to participate in the research that I am carrying out for my doctoral thesis.

I attach the questions that I would like to discuss with you. The interview should not be considered formal but something where you are able to provide insights to the questions I ask from your point of view. You may respond in any way you choose such as by talking about your experiences and how you understood those experiences; offering your definitions of aspects we might discuss; or mentioning any feelings you might have about particular aspects or situations. I am interested in your unique perspective, even if you have not encountered particular situations at first hand.

The important point is that they are your views and perceptions on the topics that you wish to bring into the interview. These can be what you thought at the time or in retrospect and on reflection.

The interview is anticipated to take between an hour and ninety minutes but this is purely dependent on how it proceeds and what you would like to cover. It may be less than this. It should ideally take place in an area where we will not be disturbed or interrupted.

I attach the questions which I am using to begin my work. These questions form the starting point for my research. It would be helpful if you could take a little time to consider these topics prior to our meeting and plan to talk about your knowledge and experiences within these topics. If you have no experience in a particular area you may wish to consider your perspective on the topic instead.

Should you have any questions I will be more than happy to answer these prior to the interview itself, at the interview, or at a later stage.

**Ethical issues**

What ever is said between us will be non-attributable to yourself or any organisation for whom you work.

You will not be named within any written document pertaining to this research, or in any other media used.

Neither will any of your organisations be named except as a government department, a private sector organisation, etc.

Organisations and participants will be anonymous in published materials and you will be identified only by pseudonym, unless otherwise agreed.

I would like to record the interview to enable me to transcribe what is said accurately. Do I have your permission to do so?

A copy of the interview transcription will be forwarded to you for your perusal as soon after the interview as practically possible and before the interview is incorporated into my work. You will have an opportunity at that stage to check it for accuracy and to add or delete any
information relevant to your experience. You will also be able to check the adequacy of any pseudonym used to ensure that confidentiality is maintained.

The transcriptions will not be available to anyone but me and my thesis supervisors and there use will be solely for the development of my research.

All materials relating to the research including interview transcripts will be kept in a locked cabinet in my research supervisor’s leader’s office when not in use.

You can withdraw from the research at any time without any penalty and you are not compelled to divulge anything that you do not wish to.

For my own part I am required to abide by the regulatory controls of my university’s Ethical Section which requires me to ensure the anonymity of all research participants who assist me with this project and will be checked by my supervisors in all work I produce.

You need take part in only one interview. I may, however, at some stage need to come back to you to carry out a further interview if new areas are identified in which I consider that it would be important to obtain your thoughts and considerations. If I do need to do this then I will again ask you for your consideration and agreement to do this. I look forward to our meeting.

The University requires that all participants be informed that if they have any complaints concerning the manner in which this research project is conducted it may be given to the researcher, or to the project leader, Professor Michael Sheehan (details below).

If an independent person is preferred, you can contact:

- the University’s School Ethics Committee or the Research Unit in Academic Registry
  University of Glamorgan, Pontypridd, Wales, CF37 1DL

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Kind regards

Dave Butcher

Consent:

I hereby agree to participate in this research project on the conditions that all the ethical requirements of the University of Glamorgan are met by the researcher and that the identity of myself and those organisations that I may name also remain anonymous.

Name: xxxxxxxxx Signature:

I agree to ensure that all my accounts of this interview will remove the names of persons and organisations to ensure that they remain anonymous in any future work that is produced.

Name: Dave Butcher Signature:
Dear xxxxxx,

Thank you for agreeing to participate in the research that I am carrying out for my doctoral thesis.

I attach the questions that I would like to discuss with you. The interview should not be considered formal but something where you are able to provide insights to the questions I ask from your point of view. You may respond in any way you choose such as by talking about your experiences and how you understood those experiences; offering your definitions of aspects we might discuss; or mentioning any feelings you might have about particular aspects or situations. I am interested in your unique perspective, even if you have not encountered particular situations at first hand.

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Should you have any questions I will be more than happy to answer these prior to the interview itself, at the interview, or at a later stage.

**Interview background (performance criteria) and questions**

Below is a list of tier-one performance criteria around which the interview will take place. Please keep these in mind when perusing the questions (below) and during the interview:

1. Time performance
   a. Time overall
   b. Time predictability
      i. Of design
      ii. Of construction
2. Cost performance
   a. Cost overall
   b. Cost predictability
      i. Of design
      ii. Of construction
3. Quality performance
   a. Conformance to specification
   b. Functionality
   c. Defects
   d. Aesthetics
4. Relationship
   a. Top management commitment
   b. Trust and respect
c. Effective communications
d. Claims & disputes
e. Professional image
   i. Drug/alcohol test results
f. Team satisfaction
g. Cultural alignment

5. Flexibility
   a. Impact upon customer business
   b. Ability to manage ‘chaos’ from other sources

6. Innovation
   a. Learning demonstrated
   b. Value management

7. Health, Safety & Environment
   a. Health
   b. Accident rate
   c. Waste
   d. Environmental complaints

**Interview questions**

How would you rank and weight the above performance factors when you are assessing the performance of your current (or selecting new) first-tier construction contractors?

How have you arrived at these factors?

What do you understand the semantic interpretations of these factors, which are most important to you, to actually be?

How would you assess performance against these factors for new and current contractors?

What would you consider excellent performance against these measures to look like?

Which tier one contractor would you say is best at delivering excellent performance against your key factors?

Which tier one contractor would you say doesn’t yet quite meet those standards, but is improving against them?

**Ethical issues**

What ever is said between us will be non-attributable to yourself or any organisation for whom you work.

You will not be named within any written document pertaining to this research, or in any other media used.

Neither will any of your organisations be named except as a government department, a private sector organisation, etc.

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I would like to record the interview to enable me to transcribe what is said accurately. Do I have your permission to do so?

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The transcriptions will not be available to anyone but me and my thesis supervisors and there use will be solely for the development of my research.

All materials relating to the research including interview transcripts will be kept in a locked cabinet in my research supervisor’s leader’s office when not in use.

You can withdraw from the research at any time without any penalty and you are not compelled to divulge anything that you do not wish to.

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You need take part in only one interview. I may, however, at some stage need to come back to you to carry out a further interview if new areas are identified in which I consider that it would be important to obtain your thoughts and considerations. If I do need to do this then I will again ask you for your consideration and agreement to do this. I look forward to our meeting.

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Name: David Butcher Signature:
Appendix B: Questions Used in the Contractor Case Studies
INTERVIEW QUESTIONS FOR LEARNING ORGANIZATION PROCESSES

TEAM LEARNING
How does the organization motivate employees to share tacit knowledge and create explicit knowledge?

What systems has the organization put in place to aid assist Employees with knowledge sharing?

How does the organization import learning and experiences from outside the organization by learning From other organizations and industries?

How is the usefulness of internal meetings assessed with respect to what is being learned that can improve the business?

PERSONAL MASTERY
How are employees encouraged to commit to lifelong learning within this organization?

What support is available to those who do commit to lifelong learning?

How can, and do, employees raise any problem issues from their perspective and implement solutions within this organization?

SYSTEMS THINKING
How does the organization exploit the interconnections between processes and departments to improve the way the organization operates?

How do you ensure that individual roles and responsibilities within the organization are aligned to the overall business vision?

What feedback loops are in place within the organization to ensure that lessons learned become implemented in service delivery?

What is the procedure for implementing business or process change/improvement within the organization?

To what extent is there coherence between the formal organisational structure and informal culture?

How does the organization flex when confronted with changes in the business environment?

How is benchmarking and measurement deployed to improve the way the organization operates?

SHARED VISION
To what extent is there coherence between organisational goals and individual employee needs?

How is the organization’s vision kept up to date?
How do employees create internal networks or communities of practice?

How is leadership demonstrated by employees other than senior managers?

**MENTAL MODELS**

How are employees encouraged to experiment within their service delivery to customers?

What is the organization’s process for evaluating and implementing new employee ideas?

What planning for potential upcoming scenarios is undertaken by the organization?

What is the organization’s innovation strategy?
Appendix C: Conference Paper and Award
EXCELLENT CONTRACTOR PERFORMANCE IN THE UK CONSTRUCTION INDUSTRY

David C.A. Butcher1 and Michael J. Sheehan2

1 Mott MacDonald, Canterbury House, 85 Newhall Street, Birmingham, UK
2 Business School, University of Glamorgan, Pontypridd CF37 1DL, UK

Within the UK construction industry, achieving compliance with output KPIs no longer represents excellent performance. Rather, such compliance tends to be viewed as the minimum performance requirement on construction programmes. Within that paradigm shift, what needs to be understood is the customer’s perspective of excellent performance. Drawing from semi-structured interviews with some of the largest construction customers in the UK, this paper develops an understanding of the customer’s perspective of excellent first-tier contractor performance on a programme of construction projects. From the customer’s perspective, a number of key behaviours determine excellent contractor performance. These include: being open about their business strengths and weaknesses against their peer group; challenging and improving themselves without the need for prompting; demonstrably adding value; really listening and acting upon the messages being transmitted by the customer; demonstrating desire to learn and share learning as part of a community; delighting the customer’s stakeholders and customers; consistency of message from employees at all levels; keeping business promises; aligning with the customer’s culture; transferring individual knowledge to the collective; and demonstrating a keen understanding of the customer’s business. This behavioural understanding has led to a shift in the way customers are interacting with their first-tier contractors. Many of the performance facets mentioned are input or ‘lead’ factors; or are about attitude and behaviour rather than pure construction competence. By managing at this level as opposed to the output KPI level, customers are to a varying extent influencing the way in which their contractors develop as businesses. The findings have implications for contractors and customers undertaking, or procuring, a large programme of construction projects so that expectations are met.

Keywords: contractors, customer perspective, excellent performance, key performance indicators, procurement.

INTRODUCTION

Understanding what excellent construction contractor performance is from the perspective of the customer is an important area when attempting to improve the industry as a whole. Given that customers fund all works within the industry, it is important to keep abreast of what they expect from their first tier contractors. Previous works have largely centred around the achievement of quantitative KPIs and on the 'golden triangle' of quality, time and cost (Wang 2006). In addition, much of the previous research has concentrated on large projects; whereas it is as important to understand excellent performance on a long running programme of works. Gaining

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such an understanding at programme level will inform contractors what ought to be their targets for continuous improvement over the life of such a programme.

RESEARCH METHODS

Construction customers with multi-million multi-year capital construction programmes were invited to take part in this research. This approach was taken as such customers are well educated in the construction process and have clear ideas about what, to them, excellent performance means. The participants were all senior enough within the customer organizations to understand what excellent contractor performance meant to them as customers. Given their standing within the overall community of UK construction industry customers, the views of these participants can therefore be treated as being representative of best practice.

The participants were briefed on what the research as a whole was about and what precisely would be their contribution. They were asked to participate in a semi-structured interview, based around the questions described below in this paper. These questions were pre-issued, verbatim, to the participants in order to allow them to gather their thoughts about the subject in advance of the interview.

Interview background (performance criteria) and questions

Below is a list of tier-one performance criteria around which the customer interviews took place. These criteria represent an initial list of factors of excellent performance in UK construction contractors from the point of view of the customer. The factors were developed from various research papers published over the last ten years. It should be noted that the research from which the factors are drawn was not solely UK based.

Participants were provided with the following list in advance of the semi-structured interview in order to help them to prepare for the interview and to stimulate responses in the interview. Participants were requested to keep these factors in mind during the interview, but were told that they could depart from them, or set them aside completely if they so wished. They therefore possessed the freedom to completely set aside the text and speak from the heart if they so wished (following Yin, 2003). The factors and questions are as follows, with author name and year of publication of the relevant research paper also listed.

Excellent performance factors

Time performance (Yeung, 2008)
Time overall (Bassioni, 2004); Time predictability (Bassioni, 2004); Of design (Martin, 2004); Of construction (Martin, 2004)

Cost performance (Yeung, 2008)
Cost overall (Bassioni, 2004); Cost predictability (Bassioni, 2004); Of design (Martin, 2004); Of construction (Martin, 2004)

Quality performance (Yeung, 2008)
Conformance to specification (Yeung, 2008); Functionality (Lam, 2007); Defects (Martin, 2004); Aesthetics (Lam, 2007)

Relationship (Chan, 2006)
Top management commitment (Yeung, 2008); Trust and respect (Yeung, 2008); Effective communications (Yeung, 2008); Claims & disputes (Lam, 2007); Professional image (Lam, 2007); Drug/alcohol test results (Crane, 1999); Team satisfaction (Lam, 2007); Cultural alignment (Chan, 2006)
Flexibility (Bassioni, 2004)
Impact upon customer business (Chan, 2004); Ability to manage ‘chaos’ from other sources (Lim, 1999)

Innovation (Yeung, 2008)
Learning demonstrated (Lam, 2007); Value management (Crane, 1999)

Health, Safety & Environment (Martin, 2004)
Health (Lam, 2007); Accident rate (Lam, 2007); Waste (Lam, 2007); Environmental complaints (Chan, 2006)

Interview questions

- How would you rank and weight the above performance factors when you are assessing the performance of your current (or selecting new) first-tier construction contractors?
- How have you arrived at these factors?
- What do you understand the semantic interpretations of these factors, which are most important to you, to actually be?
- How would you assess performance against these factors for new and current contractors?
- What would you consider excellent performance against these measures to look like?

Interview procedure

Each of the participants was interviewed once, with each interview lasting approximately fifty minutes. The interviews were all carried out at the business premises of the client, which enabled some clients to display pieces of confidential information which could not otherwise have been viewed. The questions were posed largely as set out above, but given the freedom the author had given to the participants, many of the interviews quickly departed from the text. The issues that arose are noted in the results and analysis. Furthermore, a catch all question requesting any further points, opinions or questions surrounding excellent contractor performance was posed at the logical conclusion of each interview. This occasionally yielded some further opinion and insight into customer views of their suppliers, which is also captured herein.

RESULTS AND ANALYSIS

From the interviews with the customer organizations, several interesting elements have come to the fore in terms of what excellent performance from their first tier contractors looks like. The interviews revealed that many of the traditional performance measures, such as time, quality, cost, and health & safety are treated as required performance in the current environment rather than indicators of excellence. These factors are still generally seen on Key Performance Indicator (KPI) scorecards. Such KPI scorecards are commonly used to measure all aspects of output performance on programmes of construction works. The analysis of the interviews suggests that excellent scores against these factors are now seen as the minimum requirement to continue to work for large customers. These KPI suites of output factors appear to be used in today’s market as factors for contractors to ensure against the dissatisfaction of their customer. In other words, those who do not perform well against their KPIs are those who tend to find themselves not working for the customer for very long.
They are not used in order to identify organizations for immediate dismissal from their programme, but rectification has to come quickly.

Excellent performance factors are more along the lines of input factors, such as high performing teams, learning, cultural issues and team integration. The customers who have these KPIs in place appear to understand that improving input elements will also drive the output measures. What has been uncovered is the extension beyond output KPIs to rating first tier contractors by the more ‘leading’ or ‘input’ factors. These factors may not necessarily be measured in the statistical sense but they appear to be what sets excellent performing contractors apart from their peer group.

With such a two-tiered approach, customers tend to place the statistical output (prevent dissatisfaction) measures at a project level and the qualitative/input (create satisfaction) measures at the programme level. The programme level indicators tend to be the ones which are dealt with at a very senior management level by all parties concerned. The fact that the input issues are dealt with at this level suggests a further understanding that those first tier contractors who nurture the input drivers are the excellent performers at this and output level.

**Minimum requirements of contractor performance**

*Time performance*

Yeung (2008) postulates that ‘variation of actual completion time expressed as a percentage of finally agreed completion time’ is they key element. This was confirmed as a minimum performance output (of varying importance) by all participants interviewed. Some participants also suggested that whether a programme focuses greatly upon this output depends upon changing internal drivers. What comes from this research is that customers who stated that time was the key output actually welcomed time variation, in terms of achieving completion before agreed time.

Therefore, it can be suggested that the key measure of performance is a combination of time predictability and reduction in delivery time. Participants interviewed for this research want the certainty that the handover date will be achieved, but are also interested in projects being delivered ahead of time. In addition, they need to be kept informed of an early delivery date well in advance in order to be able to take advantage of it. Given this perspective, it can be argued that although the compliance with an end date is required performance, consistently beating it, whilst keeping the customer informed, is viewed as excellent performance.

This placed time as being the key output delivery factor ahead of cost and quality as customers are realizing the opportunity cost and potential gain of time saved in the construction process. This perspective moves away from the most recent research (Yeung, 2008) which appears to focus upon the construction as the end in itself to a more commercially informed position which focuses upon the wider implications on the customer’s business as the end in sight.

*Cost performance*

Yeung’s (2008) research suggests that the key deliverable of cost performance is performance against original budget, as was concluded with time performance. Again, capital cost has been raised as an output deliverable by the participants interviewed for this research. The key difference found within this research was that performance against a budget was not always the key deliverable from the customers’ perspective.

Participants interviewed for this research did make the point that predictability of cost was a requirement for their measurement against how their projects had performed.
within their KPI suite. However, when actually selecting contractors, lowest cost was the key driver, due to the construction department being ‘managed by the accounting department’. This does demonstrate a slight duality in the performance driver. Predictability of cost was stated as important at project level to ensure funding was managed well within the customer organization. The key driver at programme level was often cost reduction to ensure that a predictable saving could be tracked and returned to the business at points in the programme.

Quality of product
Number of defects at handover point was perhaps the most consistent ‘output’ measure mentioned by the participants interviewed. It appeared that this was because all aspire to the position of having zero defects at this point. However, from the interviews it appeared as if none of the customers was achieving this goal on their programme. Such under achievement was likely to be due to the fact that projects are not constructed under anything like controlled conditions.

The aspiration of zero defects was indeed a useful goal for driving behaviours and was clearly at the forefront of construction customers’ minds during the interviews. What would set an excellent performer out from other first tier contractors would be an organization that does not have defects caused by making the same mistake more than once. Interestingly, none of the participants interviewed currently measures their defects by the business impact of those defects. Although participants did confess that this would be perhaps the most important perspective on defects from their business’s position, it was not done this way because of the difficulty of acquiring data in this way. Defects were generally measured by number and time to rectify by all of the participants. Whilst such measurement criteria may be relatively easy to achieve, it was unlikely to give the business visibility of how they were affected by the defects.

It may be argued that an excellent performer would make deliberate attempts to avoid one defect that would impact negatively upon their customer’s business. If this was done at the expense of two very minor defects, an ironic result would be the contractor incurring a worse KPI score for an intelligent action designed to protect the customer’s business. Exploring such disconnects between popular KPIs and what genuinely matters to the customer’s business is beyond the scope of this paper, but needs to be borne in mind when establishing the true nature of excellent performance.

Health, safety & environmental considerations through employee health and site accident rate, reduction of waste and reduction of environmental complaints
Again, those participants interviewed for this research viewed these listed elements as minimum requirements. Many of them are now legal requirements for compliance, although customers may put more stringent compliance requirements on their contractors than are required by law due to their own internal policies. This tends to be the case in the environmental element than in the health and safety element, possibly due to the health and safety regulations (CDM Regulations) already in force.

The elements of environmental complaints and waste reduction were discussed during the interviews, although not to the extent anticipated. Environmental complaints were generally considered from the perspective of the customer organizations’ own customers rather than the general public; albeit that in some cases these two groups were broadly the same. The key issue to the customers was again generally tied up in their contractors' understanding of their business, discussed later herein, rather than any quantitative measure.
An absence of claims & disputes
Claims and disputes were stated as not recognized by the participants in this research. It is not that disputes were dismissed out of hand; rather it would appear from the interviews that good communication may have replaced the need for dispute and litigation in these customers’ large programmes of works. First tier contractors who preferred a litigious route to deal with contractual and project problems were not welcome members of their supply chains. Other participants did not mention claims or disputes at all. While this finding suggests an absence of disputes and claims, it does not really touch upon the level and effectiveness of communication.

Differentiators and demonstrators of excellent performance
Excellent relationships; through top management commitment, high levels of trust and respect, effective communications, contractor team satisfaction and excellent cultural alignment between customer and contractor.
The elements above were almost all mentioned as clear indicators of excellent performing contractors by most of the participants interviewed in this research. Some of the perspectives, however, differ from those published in recent research. Top management commitment was discussed during interviews as an intangible quality provided by the better contractors which was not measured in any clear way.

Yeung’s (2008) perspective was that the key performance was shown by the percentage of top management attendance in partnering meetings. From the interviews carried out for the research here reported, it was difficult to see how Yeung’s (2008) measure demonstrates excellent performance. While it is an easily measurable metric, having people in a room does not demonstrate commitment in the way it was described in the interviews. Attendees at meetings may not be committed, they may be disruptive or disinterested in terms of not demonstrating an emotional attachment. Therefore having the wrong type of people at top management level may actually remove performance from a contractor's delivery offering.

This research uncovered the need to purchase first tier contractor management capability as part of the overall package provided. Such capability was seen as adding value through the management of practical delivery and planning. In such a delivery model the responsibility for the delivery of the programme rests with the first tier contractors rather than the customer. Such an approach will require a greater deal of first tier contractor management commitment than if they were simply delivering projects which were allocated to them by the customer.

Emotional intelligence was raised as a major differentiator between first tier contractors in terms of management commitment. Customers can identify those contractors who treat the programme of works given to them as merely an income stream and those who have emotional engagement. Participants suggested that such engagement was one of the roots of first tier contractors understanding what they want as customers. This was a key factor in creating excellent performance as the contractor could align themselves to deliver what the customer requires from their service delivery. A less than excellent contractor was seen as tending towards providing standard service based upon what they were used to doing for other customers.

Stating an emotional attachment as a differentiator between contractors was seen to be an interesting perspective as it suggested a mental commitment being made by the contractor’s management. This was a difficult element to measure but was seen to emerge from the experience the customer had in dealing with the contractor. Given the
emphasis that participants put upon this point during interview, it was clear that such a commitment was clearly something they were looking for in their first tier contractors.

Yeung’s (2008) understanding of trust and respect measure used a Likert scale of satisfaction scores. Discussions of trust and respect in the research here reported centred more around customers not needing to examine and/or interfere in the delivery provided by their contractors. The view was that trust and respect were what excellent performing contractors shared with the customer when the customer knew that their programme of works would be delivered without the need to worry. Participants were noting an increasing ability to trust their first tier contractors with the delivery of the programme. In addition, they were trusted to comply with key outputs without the need for customer intervention. Participants stated that they are starting to impart trust to first tier suppliers to deal directly with their own stakeholders on their behalf. Improvement in the trust area had thereby removed a potentially wasteful communication step, thereby adding value to all parties.

Yeung (2008) takes the perspective that excellent communication is a requirement of excellent performance. His position, again, is that it should be a Likert scale measure of key stakeholders' opinions of the effectiveness to differentiate contractor performance. Some participants within the research here reported discussed performance improvements being a function of good dialogue between customer and contractor. Others spoke of the detailed engagement required to establish long term development plans with their first tier contractors in order to achieve the goals of both organizations. Another had formed a formal alliance with their first tier contractors which involved communication at many levels.

Effective and consistent communication was taken for granted within these construction relationships. In fact, many comments made about poor performers also appeared to centre on the issue of communication. To some customers, the ability of the contractor to listen was a big differentiator between excellent performers and the rest. This was an interesting perspective and seemingly not discussed in depth in previous literature. It also strongly alluded to two way communications being a real differentiator, whereas the previous research had tended to focus more upon how the contractor transmits messages to the customer. Through excellent communication, excellent performing contractors will show an aptitude for quickly understanding and aligning themselves behind the message coming from their customer. The output priorities may change (often from between quality, time and cost) through the life of a programme of construction works depending upon the needs of the customer.

Assuming that the customer was informed from a construction perspective and was able to articulate the message about what was important to them, the excellent performer would be able to pick up that message and deliver on it. The excellent performing contractor was as much about customers giving the correct message as the contractor themselves interpreting it. Other participants stated annoyance at contractors who join their supply chain and try to dictate what should be important to the customer rather than listen to that message. Again, this finding alludes to the importance of two way communication.

One element of communication from contractor to customer which did come out as being an element of excellent performance was the propensity to challenge the customer organization to improve what they were doing. One particular participant stated that contractors who act as ‘yes men’ when the customer was making an obvious error were not excellent performers. This argument was distinct from
dictating what was important to the customer; it was more along the lines of acting as a consultant to help the customer deliver what was important without making a mistake whilst so doing. This assertion can be described as a link between top management relationships and communication.

Another interesting perspective raised was that excellent performing contractors possess a ‘commitment to constant dissatisfaction’. This perspective suggested that satisfaction was viewed by customers today as a journey with perhaps no ultimate destination. Respondents stated that excellent contractors were those who, no matter how well they have performed, are always dissatisfied with it and look to perform better next time. One key observation here was that the perspective of the customer of satisfaction was that of 'programme outputs' as opposed to Lam’s (2007) position of satisfaction being happiness in the job. It was seen to be entirely possible that the two were one and the same, but such a finding is beyond the scope of this paper.

Attitude was seen to be another element which customers were now looking at when considering excellent performance. It was not viewed as customers only wanting to work with contractors who were the same as them in their outlook to business, but clearly it can help. There are several key attributes which were mentioned during the interviews: a strong sense of integrity, the desire to create transparency in terms of their performance and their business, commitment to constant dissatisfaction, a strong desire to learn from other people, and an ingrained culture of relationship building.

The customers who organized their first tier contractors into an alliance delivery route mentioned the desire to learn and to work at relationship building consistently. These customers understood that their first tier contractors were part of a community, or even several communities. How those communities worked as stand alone and interlinked communities was seen to be vital to them successfully delivering the output of their programme. It appeared that the correct attitudes and behaviours were key to making long term programmes and alliances successful.

Chan’s (2006) position was that partnering for construction excellence relies partly upon a shared culture and approach to business without organizational boundaries. It became clear from the research here reported that customers were looking increasingly for attitude and behaviour as key criteria when hiring individuals for their organizations. There was seen to be a departure from hiring on pure competency as there was an understanding that with the correct attitude and behaviour, competency could be achieved through appropriate learning and development.

This finding was seen to be a clear position set out by the participants and it appeared that rather than looking to develop the correct cultures in workshops, customers were looking actively for contractors who came to them with these qualities already demonstrated. Excellent performance was therefore also defined as an organization staffing its delivery team with key personnel with the correct attitude and behaviour.

**Innovation through learning demonstrated and the ability to value manage the project solution**

Innovation was viewed as a way that a first tier contractor could add value to the construction process that was beyond the contract or project specification. Some have described this differentiator as the ability of the first tier contractor to think on their feet when encountering issues on site. Alternatively, innovation can manifest itself as being able to give input at the design development stage which assisted in designing out waste at a project level. Innovation in terms of wholesale changes in the way
things were done appeared to come from the materials or building technology arenas rather than contractors, according to the participants in the study here reported.

Yeung’s (2008) perspective on innovation was that the cost saving resulting from innovation was the key measurable. This assertion, however, did not concur with the information gleaned from the interviews. Yeung’s (2008) perspective assumes that cost was the most important output to the customer. However, given that one of the key points of research here reported was that the main driving output of the construction programme change, such a perspective for innovation requires widening. Yeung's (2008) position appears to be more akin to value management which was not mentioned in any great depth by the interviewees in this research. ‘Designing out waste’ can mean cost, but it could also mean time or elements of design that compromise the function or functional requirements of the finished product.

Those customers who do still carry out the bulk of measurement at an output level appear to understand the power of learning as a performance differentiator. Customers understand that output measures might be fallible due to the uncertain nature of construction works. Participants acknowledged that mistakes would be made during projects and that these may be created by the customer themselves. Kagioglou (2001) suggested that the ability to learn from experience as an organization was a measurable as part of a process/performance measurement scorecard although it must be driven in alignment with overall vision and strategy.

Sharing learning
What also became clear from the research here reported was that contractors working together on large programmes of work need to exchange learning that drives excellence. If one contractor on a large programme was performing excellently and others were falling behind then this added less value to the customer than if all were performing excellently. Therefore, excellent performers were those who learn and share learning with their peer group to advantage their mutual customer. If the 'bar is raised' by all contractors on a programme, they can take this improvement and spread it to other customer work streams. This way all contractors who take part in learning and sharing gain something, while the customer also gains.

Role of the customer
The above excellent contractor performance aspects should not go without a mention of the role of the customer in the construction programme. The comments that came from the participants were that they have to be giving the correct messages about the above issues. Customers understand that excellent performance will only be delivered following excellent leadership from the customer themselves. If customers do not act in such a way that demonstrates and encourages excellent performance, than they are unlikely to receive it from their supply chain.

CONCLUSIONS AND RECOMMENDATIONS

Performance Management
Following on from the research here reported, there needs to be a paradigm shift in the way in which the industry measures and manages its first tier suppliers. This research suggests that customers should expand their performance management beyond the use of output KPIs. Customers who keep extensive output KPI suites may have to reduce these in order to incorporate the following input measures:

- Emotional commitment and ownership of the programme
- Effective two-way communication
- Contractor developing their business to align with the customer
- Effective and appropriate challenge of customer decisions
- Commitment to constant dissatisfaction, at the business and programme levels
- Transparency of business performance
- Consistency of attitude, behaviour and culture
- Delighting the customer's stakeholders
- Protecting the customer's business from the impact of construction
- Flexibility and responsiveness to programme change
- Focussed innovation and learning with tangible outputs

Customers will have to develop a framework around these in a way that best suits their business requirements. The results element of the research provides an in-depth recommendation of a starting point for a best-practice model. It is accepted that this will require a certain amount of deeper thought and preparation than a simple output KPI suite. The extra effort, however, would be more than repaid in terms of the customer being able to better manage the contractor in driving the required behaviours. There would be no room for 'box ticking' in order to achieve KPI measures at the expense of what may be really important to the customer. Furthermore, it would alleviate the annoyance of contractors who harm their own KPI scores by focussing upon what they know is really important to their customer.

These new best practice performance management factors can, if necessary, be measured quantitatively, but the more important issue is that they are identified and proactively managed. If these are to be measured as an 'input KPI suite', then the customer will need to define exactly what s/he needs to be the behaviours demonstrated under each one. The required behaviours will have to be clear enough to be adopted and followed and be focussed enough that improving them will add real value to the customer's programme. In this way, areas which delight customers will be managed alongside those which simply keep them satisfied.

It is suggested that these input factor KPIs are updated quarterly as part of a managed performance improvement programme. Performance improvement initiatives can be put in place to support and improve each of the behaviours. This is recommended as a long term approach to performance improvement that will improve the contractor businesses at the same time as driving excellent performance to the customer. The customer and the contractor should work together to establish the finer points of the required performance and when the performance level should be reached. The initiatives can then be crafted to achieve this level of performance and this can be a further measurable item. In addition, output KPIs will be improved through the management of the excellent performance inputs. Driving longer term improvement at the input level is more likely to drive a sustained improvement in outputs than trying to manage the outputs alone.

Contractors themselves need to start examining themselves on the basis of these performance factors. To what extent are they providing them for their customers? What could they do to improve their performance in these areas? This paper serves as an initial guide as to what contractors should be focussing upon proactively. More customers are becoming more educated on the construction delivery process and becoming more savvy about what they want from their supply chain. Therefore contractors who can demonstrate that they are becoming more educated in these areas too are likely to steal a march on their competition.
REFERENCES


