Case Study: Impact of Adopting Agile Methods in ICT Shared Services

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Declaration

I declare that the work described in this dissertation is, except where otherwise stated, entirely my own work, and has not been submitted as an exercise for a degree at this or any other university. I further declare that this research has been carried out in full compliance with the ethical research requirements of the School of Computer Science and Statistics.

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Abstract

A more agile IT infrastructure promises to drive new business value, reduce costs and deliver sustainable growth into the future for an enterprise. Yet, to achieve such a transformation, IT organisations must be prepared to review their existing project delivery methodologies, review their IT team structure and understand the potential impact on their employee's. This research is a case study assessment of an ICT shared services company based in Ireland that runs on a traditional waterfall methodology, which many customers have noted as slow and costly. Agile methodologies and DevOPS is a promising addition to project delivery offering practitioners the ability to deliver infrastructure and products to the customer in shorter time frames. The ability to be more agile has captured the attention of mangers and different lines of business. Despite this suggestion, empirical evidence has been sparse to understand the impact of introducing new methodologies or alternating team structures within an organisation and the role corporate culture has to play in those changes.

The research investigates the introduction of agile methodologies and DevOPS use in an ICT shared services company. A variation of agile methodologies and DevOPS was observed. From this research, the most interesting finding is the role of the corporate culture in agile environments. The research establishes that while considerable effort and resources may be spent in developing highly agile delivery environments and DevOPS teams, with a culture that does not support the values in either aspect, the rewards of these endeavours will be significantly limited. In addition, the study also establishes that deploying DevOPS presents more difficulties than benefits. The research also highlights the difficulties faced by the ICT shared services company adopting agile methodologies and suggests that it would be more suitable to adopt components of agile methods framework rather than introducing bulk changes such that the introduction cannot interfere with the day to day operations.

Table of Contents

List of Tables

List of Figures

Abbreviations

ICT	Information and Communication Technology
ETS	European Technology Services
RDU	Rapid Delivery Unit
TI	Technology Infrastructure
VUCA	Volatility, Uncertainty, Complexity and Ambiguity
UMF	Unfreezing Moving Freezing
IaaS	Infrastructure as a Service
SaaS	Software as a Service
PaaS	Platform as a Service
DSDM	Dynamic Systems Development Method
LMI/X	Leader Member Interaction/Exchange
UK	United Kingdom
EUTSDM	European Technology Services Delivery Methodology
DevOPS	Development and Operations
ETS	Production Support Team
ETI	Project Team

1 Introduction

1.1 Background and Context

This research is a case study assessment of a European ICT shared services company based in Ireland. European Technology Services known as ETS is a shared services company that supports multiple lines of business and companies across Europe. It is within the ETS company that this dissertation is focused. The ETS shared services company was formed in 2006 post the acquisition of a United Kingdom (UK) company. While the individual country business units remained relatively independent the IT organisation underwent a centralisation of IT out of the UK and into Dublin. The centralisation resulted in significant job losses in the UK and corresponding job growth within Ireland.

In today's volatile business environments, firms must be agile and be able to handle extreme changes, survive unprecedented threats and capitalise on emerging business opportunities (Prahalad, 2009). Past research generally has shown that IT can enable agility by speeding up decision making, facilitating communication and responding quickly to change (Lucas Jr and Olson, 1994). However, researchers have also noted that IT may hinder and sometimes impede an organisation's agility (Overby et al., 2006). In recent months ETS has been noted by some lines of business to be expensive, difficult and rigid to deal with. A more agile IT infrastructure promises to drive new business value, reduce costs and deliver sustainable growth into the future for an enterprise. Yet, to achieve such a transformation, IT organisations must be prepared to review their existing project delivery methodologies, review their IT team structure and understand the potential impact on their employee's.

According to Cobb (2012) the agile form of methodology emphasises quick delivery and feedback relay, and these are primarily driven by enhanced communication between various involved parties. According to Feldman, Link and Siegel (2012), to ensure competitiveness, all organisational units must be technologically equipped to current market standards. However, business departments have varying needs and goals (Kaplan and Anderson, 2013). Businesses are often so constrained by the silos of IT teams that IT becomes a disabler for agile delivery of infrastructure and services (van

Oosterhout et al., 2006). Therefore, IT organisations need to review their ability to delivery services in a timely manner at reduced costs. However, considerable expenses are used in aligning departmental activities to reduce the constraints of silo IT teams (Kaplan and Anderson, 2013).

DevOPS is one of the concepts this research will seek to establish that has steadily gained popularity over the past decade (Httermann, 2012). According to Swartout (2014), the concept closes gaps between the Development (Dev) and Operations (OPS) units through enhanced resource sharing and activity alignment. However, in spite of some advantages presented by this and similar concepts, the ETS company continues to run on a traditional model, which separate the activities of these two core units. Accordingly, ETS may struggle to be an effective service because its delivery structure is already undermined by the traditional model. This incapacitation causes slow service delivery and often involves high costs, as evidenced by the many customer complaints.

Furthermore, Swink et al. (2011) point out that the quality of products delivered when the operations and development units work separately is considerably lower than when units allow for more integration. Traditionally, development involves fabrication of ideas, which are then implemented to produce a working model (Swink et al., 2011). The operations units include all business activities (marketing, sales, maintenance and others) (Slack, 2015): it is at these units that the model is tested and the feedback relayed back to the development division for product enhancement. Accordingly, when the two departments' activities are not strongly aligned, the quality of delivery deteriorates because communication is considerably hampered. The ETS company is involved in shared services delivery, which Baun et al. (2011) note as a service characterised by fluctuating customer tastes and rapid technological advancements over short periods. Therefore, to effectively and continually deliver market-relevant products, the company's development division should have a model that supports active customer input and personnel feedback.

This research will also seek to establish the impact an organisation's culture has on the process of implementing change. To successfully undertake change in organisation, cultures must be based on open communication and high employee support (Robbins and Judge, 2003). Furthermore, Cameron and Green (2015) note that organisations with considerable support for employees are more likely to yield high compliance levels than those with unsupportive environments.

1.2 Research Questions

This case study addresses the following research questions:

“What impact does an ICT shared services methodology have on rapid project delivery?”

The research question presented by this study focuses on four key elements:

1. To study the various organisational factors involved selecting a project delivery model in the ETS company
2. To study the impact of forming a new DevOPS or Rapid Delivery Unit in ETS
3. To integrate identified aspects of agile project delivery methodologies and recommend a new methodology for the ETS company
4. To study the impact of organisation structure change on people in ETS

1.3 Research Interest and Beneficiaries

The case study organisation is a large ICT shared services company used to provide support and services for a number of financial institutions across Europe. The ETS company has a number of customers with different business strategies and attempts to align with each of those individual units. While the case study organisation implemented some agile methodologies and change in team structures temporarily, permanent changes have not been put in place. The ETS company has not made the changes permanent as the initial changes implemented were completed for one line of business in response to business demand.

Practitioners and researchers recognise the value of flexible and adaptive IT infrastructure (Byrd and Turner, 2001). The ability to deliver flexible IT infrastructure is crucial to organisations in developing sustained competitive advantage (Davenport and Linder, 1994). The research hopes to present a snapshot of considerations, concerns and potential changes that may be considered by decision makers, strategists and other interested stakeholders.

The research will be of interest to any company looking to develop or change methodologies within their organisations especially those organisations that require rapid delivery of products and services to customers. In particular, this research should provide value in choosing an approach to their methodologies and team structures. Managers can use the findings and recommendations from this study to help understand the potential impact on corporate culture that these changes may bring. It is intended to also prove useful to academics looking for a case study example of the impact of adopting new methodologies and understanding the impact on corporate culture.

1.4 The Scope and Boundaries of the Research

The scope of this research is limited to an ICT shared services company in a financial institution in Ireland. The research seeks to determine the suitability of existing project delivery methodologies, team structures and aims to discover the impact of adopting new methodologies with potential changes to organisation structure. This research has been presented as a single case study within a financial institution based in Ireland. The single case study approach will reduce the scope in view of a limited time available to carry out the research. The literature review will also form part of the secondary source of data. Section 2.3, Section 2.5 and Section 2.8 include some case study data on organisations that have implemented similar changes due to ever changing customer demands. The research involved a qualitative approach and eight interviews were conducted in support of the research, with all participants being senior employees, key stakeholders and decision makers within ETS organisation.

The results of the findings will be compared against findings in available literature reviewed. These findings of the research will form the basis for making recommendations regarding an appropriate approach to potentially adopting a change in methodology or structure.

1.5 Chapter Structure

The dissertation is structured as follows:

- Chapter 1: Introduction
  This chapter introduces the context and rationale for choosing the research question. It outlines the relevant background to the research question and why the chosen focus is important. It outlines the scope of the research and who is likely to benefit from this study.

- Chapter 2: Literature Review
  This chapter reviews important and relevant literature relating to the research question. It explores the concepts surrounding project delivery methodologies, DevOps and organisation culture. It explores the theoretical background to the research question.

- Chapter 3: Methodology and Fieldwork
  This chapter provides a brief overview of the research philosophies, methodologies and strategies available to the researcher. It explains the reason for chosen research methodology as well as the merits and limitations of choosing such an approach.

- Chapter 4: Findings and Analysis
  This chapter analyses and interprets the data that was collected from the face to face interviews. It reports what the research revealed and references it in context of the literature review.

- Chapter 5: Conclusions and Future Work
  This chapter concludes the dissertation by discussing the findings of the research and determining whether the data collected has answered the research question. It contains recommendations for potential future research areas in the field.

2 Literature Review

2.1 Introduction

According to Mutka and Aaltonen (2013), there are numerous project delivery methods that technology providers can adopt. Other models aim to enhance quality, teamwork, company knowledge-management (KM), communication processes (Purna Sudhakar, 2012, Oakland, 2014) and so forth. Many of the current delivery models involve cloud-based technologies, which have revolutionised business operations in the last decade (Subashini and Kavitha, 2011). These project delivery processes are characterised by advantages like remote access, economies of scale (EOS), service virtualisation and many more. Xu (2012) suggests that cloud-based project delivery models have enhanced storage, software sharing, marketing, among many other development and operations processes. For instance, Missbach et al. (2013) projects that a hybrid of cloud-based Infrastructure as a Service (IaaS), Software as a Service (SaaS) and Platform as a Service (PaaS) will be major delivery alternatives for businesses. These systems support every Information Systems (IS) requirement for a business and are advantageous especially when cloud-based because of lesser costs and better security (Missbach et al., 2013). Furthermore, these delivery models are highly modularised; therefore, essential features can be derived from these models and applied in developing a project delivery structure for the company.

According to Zissis and Lekkas (2011), for speed and cost-effectiveness in the delivery process of Information Systems, enhanced communication is necessary. Furthermore, Xu (2012) suggests that a DevOPS model that strongly supports real-time sharing, continuous delivery, data analysis, virtualisation, among other processes, is necessary for better collaboration between the Dev and OPS units. In addition, to increase relevancy, cost-related considerations should also be factored in developed project models (Anderson and McGreal, 2012). Economical models will benefit the ETS company because many complaints from customers involve high delivery costs. Zott et al. (2011) point out that some of the models often considered alongside traditional structures are the integrative, collaborative and partnership models. These models differ on the level of involvement of providers, incurred costs, delivery durations, quality, timeline and ownership (Subashini and Kavitha, 2011). For instance, in both the

integrative model and collaborative model, the providers have considerable influence in choosing various project players. On the other hand, the traditional model allows facilitation from the customers; while partnership involves a continuing relationship between clients and contractors (Zott et al., 2011). As a result, a partnership will be most effective when enhancing communication, speed and product quality, especially for critical processes like business IS.

2.2 Project Delivery Methodology

2.2.1 Waterfall Methodology

As suggested by Larson and Gray (2011), several variables are used to define project methodologies. For instance, one of the commonly employed metrics is the adopted approach for project implementation, in which aspects such as waterfall, top-down (Larson and Gray, 2011) (Balaji and Murugaiyan, 2012) and so forth are used. Figure 2.1 depicts the typical waterfall model.

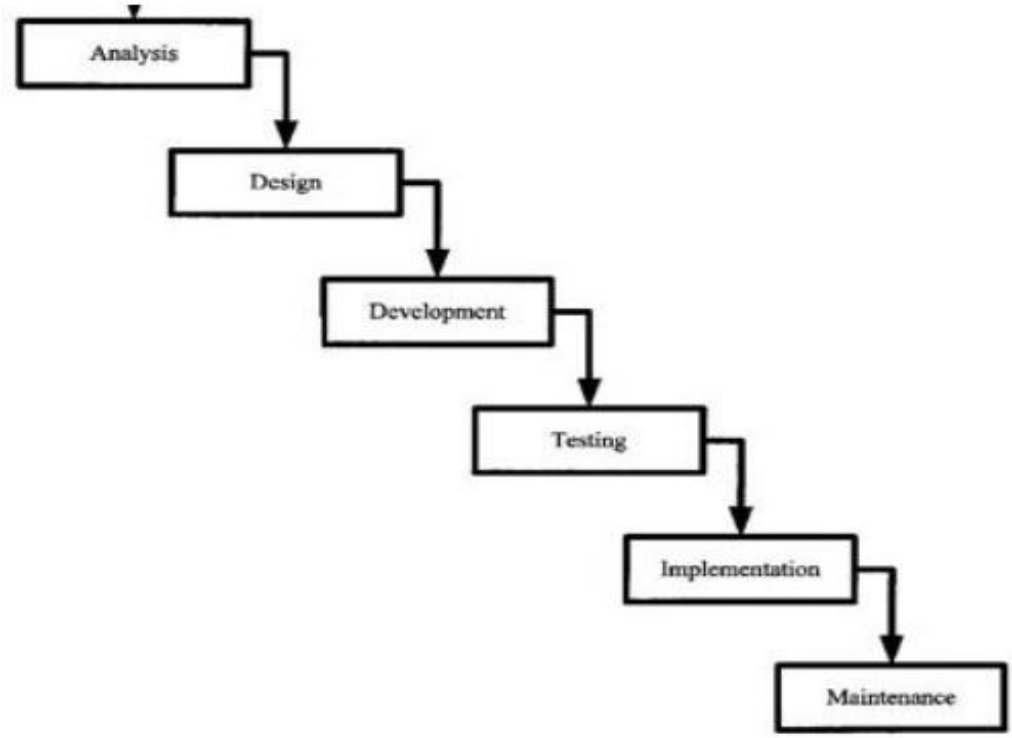

Figure 2.1 – The Waterfall Model (Balaji and Murugaiyan, 2012)

Additionally, because of the technological advancements of the contemporary world, Ambler and Lines (2012) note that technical aspects are widely considered in various fields. Particularly, in project delivery, speed, the level of collaboration, and knowledge management, among many others, are some of the technology-related aspects used to formulate and analyse various methodologies (Wysocki, 2011). One of the project delivery methodologies that has attracted widespread attention is the agile project.

2.2.2 Agile Methodology

According to Cobb (2012) this form of methodology emphasises quick delivery and feedback relay, and these are primarily driven by enhanced communication between various involved parties. In the agile project delivery methodology, the client is given pre-eminence over all other parties and their feedback is of vital importance (Ambler and Lines, 2012). In fact, Pham (2011) employs the widely used adage that regardless of the position taken, customers are always justified, to point out the core principle of agile project delivery. However, Eckstein (2013) holds the view that rather than focusing on the customer, fast communication is the main quality of agile methodologies. He argues that while consumer feedback is a major consideration, communication between different organisational divisions, and particularly, the development and operations units, is a critical factor in agile project methodologies (Eckstein, 2013). However, there are some risks to manage regarding these methodologies (Cobb, 2012). In fact, this is the main objection to the integration of agile methodologies, and as noted by Meredith and Mantel Jr (2011), the main proponents of the view are the more conservative managers. However, Eckstein (2013) notes that these risks are considerably reduced by the enhanced communication created by agile structures. In fact, should a company experience oversights due to speed that these methodologies promote, there is a high probability that consumer feedback will identify these errors and effect change (Boyer and Mili, 2011). However, overall, agile project delivery methodologies have been widely adopted by organisations (Eckstein, 2013).

2.2.3 Agile Methodology Considerations

Poppendieck and Cusumano (2012) point out that the agile delivery models focus on the main elements of a project process and find ways of bolstering these factors. Therefore, while risk evaluation is conducted in the agile infrastructure delivery model, stakeholders - mainly consumers - are focused on throughout the entire agile project process (Eckstein, 2013) and not within a single stage.

As regards the ETS company, to adopt agile methods the company would have to analyse their existing European Technology Services Delivery Methodology (EUTSDM) through different stages. According to Cobb (2012), Pham (2011), when analysing various options, organisations that have integrated agile systems consider a wide array of aspects including cost implication and required resources. In fact, these factors are the main determinants for movement to subsequent stages (Collier, 2011). Therefore, to link the ETS company's EUTSDM model in Appendix 8 with an agile infrastructure, system planning would be critically analysed such that by the end of the stage, an ideal project plan and associated alternatives are realised. Accordingly, the two stages of project planning and budgeting, and architecture design, are integrated into an agile delivery model. The subsequent stage after project planning (Build-Infrastructure) cannot feature in an agile model because its activities strongly correlate with those of the architecture design and analysis stage.

Moreover, in the ETS company's project delivery model, the proposed system is evaluated in isolation; similarly, in agile delivery models, testing is considered a critical factor (Coplien and Bjørnvig, 2011). However, while the company, only focuses on obtaining a summary report from the testing phase, Ambler and Lines (2012) note that agile environments capture aspects such as consumer feedback and worker experience with the aim of enhancing adopted systems. In addition, after the testing phase, the ETS company's project delivery model conducts two successive implementation processes. In agile models, the testing phase is very comprehensive such that typically, only a single implementation process is conducted (Coplien and Bjørnvig, 2011). The development of user guides or training material is necessary for agile systems, but not critical; the same applies to the analysis of lessons learnt. Therefore, agile delivery models usually terminate after the implementation stage and, where need arises, can include training material development and a reflection of the entire process.

2.3 Case Study 1: Agile Delivery at British Telecom

British Telecom (BT) is a quintessential example of an organisation that incorporated an agile project delivery model with the aim of speeding up company processes. Heim (2013) points out that in the early 2000s, BT's employee base was considerable and among these were over 8000 IT personnel who had specialities in different areas. In the company's project delivery model, the waterfall approach was extensively employed and, as noted by Heim (2013), presented numerous challenges. As opposed to the agile model, in a waterfall-based delivery structure, individual processes are conducted sequentially (Palmquist et al., 2013). Balaji and Murugaiyan (2012) point out that with this model, integration presents considerable challenges.

For instance, in BT's case, the coding IT team often encountered software bugs and to address them, the input of the entire development unit was critical. However, as pointed out by Cooke (2014), as regards project activities, BT's teams were always at different stages. Accordingly, addressing bugs and other critical development factors proved difficult and considerably slowed the delivery process. Furthermore, Cooke (2012) points out that because of such complexities, the organisation started becoming averse to development programmes and little or no resources were allocated for new initiatives. Continued failure and project complexities hamper team spirit, the creativity of personnel and positivity of leadership (Wysocki, 2011); therefore, the case of BT manifests the views of Wysocki (2011). Besides integration complexities and development avoidance, because of the waterfall delivery model, deployment took considerable time Heim (2013). Furthermore, Cooke (2012) posits that these integration failures resulted in system anomalies, which in turn made deployment impossible. In addition, as opposed to the desired results, these complexities and anomalies led to unmet project targets (Cooke, 2014). Therefore, overall, BT was actively engaged in development programmes, but in reality was neither meeting objectives nor progressing, which, taken together, led to organisational stagnation.

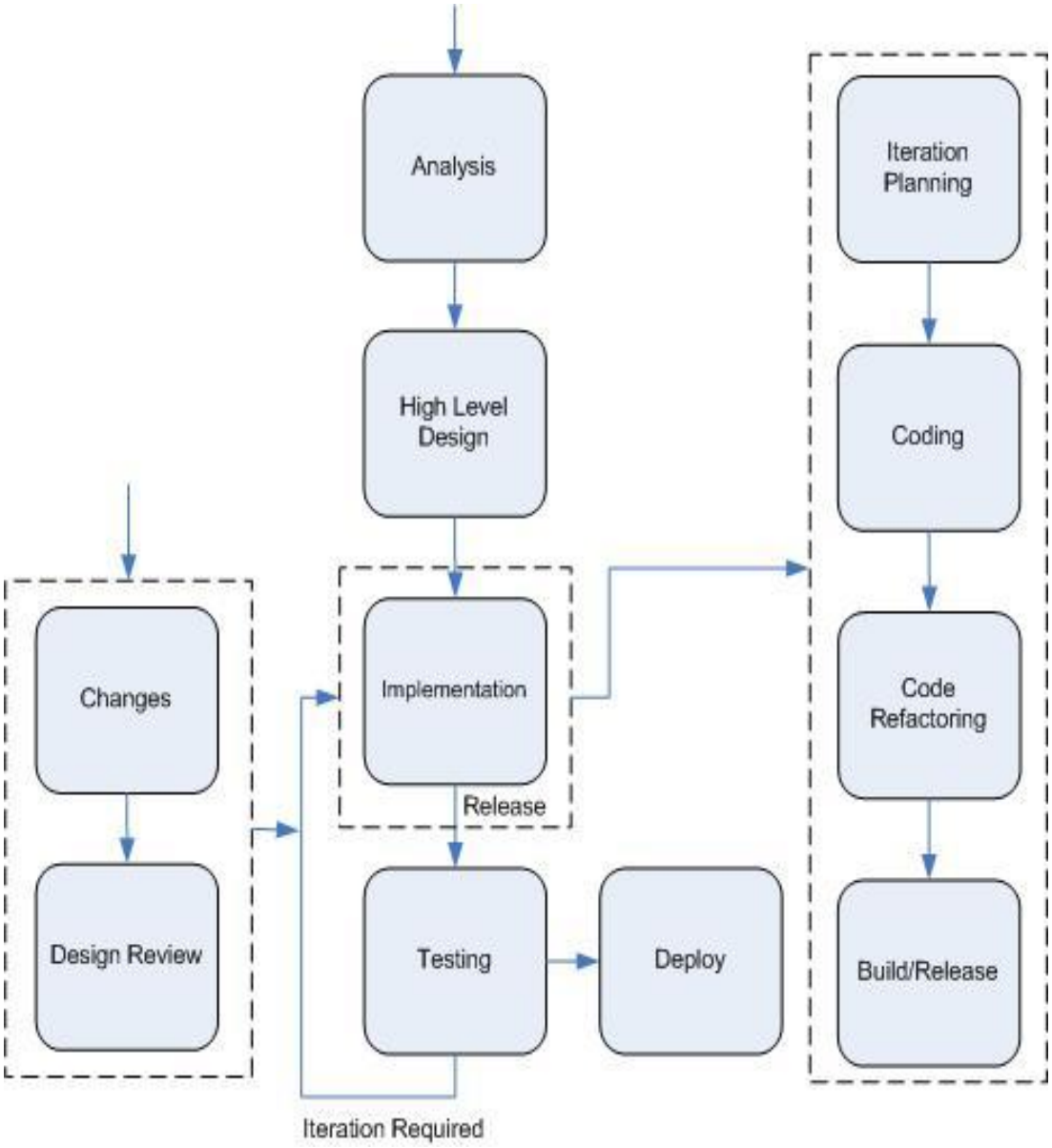

Figure 2.2 – Agile methodology adopted in BT in 2010 (Heim, 2013)

As a response to these factors, BT decided to integrate an agile delivery system in the mid-2000s. Specifically, the company integrated the Dynamic Systems Development (DSDM) and Scrum approaches (Heim, 2013).

Method Name	Key Points	Special Features
DSDM	Application of controls to rationale application design, use of time boxing and empowered DSDM teams	First truly agile software development method and use of prototyping
SCRUM	Independent, small, self-organising development teams and up to 30-day release cycles	Enforce a paradigm shift from the defined and repeatable to the new product development view of scrum

Table 2.1 – General Features of DSDM and SCRUM (Fowler, 2001)

As suggested by Cooke (2011), one of the aspects advanced in DSDM is a strict focus on delivering value. This stage made BT reassess its objectives and exclude those that had no business value. Furthermore, considering that the DSDM stage focuses on value delivery, it implies that consumers are the central focus. Therefore, BT put consumers at centre stage and used their feedback to model systems and programmes. While the technologies of this period could allow communication between BT and consumers, the process lacked the numerous features present in current feedback systems. Accordingly, as a result of communication inadequacy, the company focused on enhancing the user experience which, besides obtaining feedback from actual consumers, involved the firm's personnel (Cooke, 2012).

In DSDM, BT endeavoured to create a highly collaborative environment. Coplien and Bjørnvig (2011) points out that collaboration is the driver of agile project delivery. Achieving this quality in teams implies that communication is enhanced and integration is achieved, which in BT's case was problematic. The company created a delivery periodical cycle that increased the accountability of involved personnel (Cooke, 2014). Hence, this required the integration of another agile approach. To ensure that targets were met within the set periods, Heim (2013) notes that BT also adopted Scrum; the agile environment framework that is characterised by iterations and continuous assessments (Cooke, 2011). Furthermore, to enable fast delivery, in Scrum, projects are undertaken simultaneously. Nonetheless, Cooke (2012) posits that in this implementation, the company faced numerous challenges. Chiefly, given that the DSDM framework had not been widely adopted, the risk associated with the process

was considerable. Furthermore, there were difficulties working with globally stationed software development staff. Notwithstanding, through the implementation of these processes, BT successfully solved its integration, development and deployment challenges.

2.4 DevOPS

DevOPS is a widely used agile delivery framework in modern global enterprise. The term is derived from 'Development' and 'Operations,' which are the core organisational units that the framework focuses on (Humble and Molesky, 2011). Bass et al. (2015) contend that the main motivation of the framework's development was the appreciation of organisational divisions' key roles in project delivery. In the framework, it is assumed that in development, two major players are involved: the Development (Dev) and Operations (OPS) units. The main role of Dev is the development of software while OPS acts as a channel that relays consumer feedback and at the same time markets developed products (Httermann, 2012). DevOPS recognises the fact that for proper and relevant software development, consumer needs, which are the central focus of agile product delivery, must be given pre-eminence. Accordingly, DevOPS involves the development of agile delivery systems that aim to increase collaboration between Dev and OPS organisational units (Debois, 2011). In addition, Bass et al. (2015) emphasise that DevOPS is not merely a framework; the concept has a considerable impact on the organisational culture of firms. The impact of DevOPS on non-distinctive aspects of firms is notable in the fact that the values of personnel are considerably affected.

2.4.1 DevOPS Framework

Accordingly, DevOPS can be viewed as a framework whose impact involves distinctive and intangible company aspects. Roebuck (2012) points out that the integration of DevOPS involves numerous aspects. For quick integration, since the operations department is not involved with highly technical aspects, the process should start at OPS (Schaefer et al., 2013). In this stage, the resources shared with Dev are critically evaluated and, when necessary, enhanced. As noted by Httermann (2012) one of the commonly shared resources is PaaS and its optimisation is conducted at this stage. In

a bid to test the impact of DevOPS, team members from the OPS unit are extensively engaged in the second phase (Schaefer et al., 2013). In the third stage, integration is performed by Dev. Loukides (2012) and Phifer (2011) points out that of all stages, this stage is the most complicated and requires considerable expertise. The activity involves streamlining all Dev activities such that all collaboration and resource sharing with OPS is achieved (Httermann, 2012).

Furthermore, Walls (2013) notes that when applied to personnel, many DevOPS implementation mechanisms exist and have different success levels. For instance, integration can involve summoning both unit members and informing them that they will be working together. Walls (2013) notes that such a mode is particularly risky and is associated with failure because there is minimal employee compliance. On the other hand, implementation could involve successive stages where employee input is requested from project commencement to termination; this approach is noted as highly effective (Smeds et al., 2015). On integration, besides achieving collaboration and thereby increasing the project delivery cycle, through enhanced communication, DevOPS solidifies the loyalty of consumers (Loukides, 2012). In addition, as pointed out by Humble and Molesky (2011), DevOPS leads to the production of highly market relevant products, which may translate to much greater sales volumes by involved organisations. However, there are numerous objections to the integration of this agile project delivery framework. One of the factors that is often argued to undermine the incorporation of DevOPS is cost-effectiveness. The integration of DevOPS involves high costs Httermann (2012), which automatically deters less resourced companies.

Furthermore, for DevOPS to have a significant impact on company processes, skilled technical personnel are required for continuous optimisation and maintenance (Httermann, 2012). Therefore, this points to increased incurred costs for firms. However, Walls (2013) holds the view that the benefits gained from integrating DevOPS outweigh installation expenses. Besides eliminating project bottlenecks, the framework realises quick project delivery and hence considerably increases company output (Walls, 2013).

2.4.2 Considerations for Integrating DevOPS

As regards the ETS company, DevOPS integration in the suggested agile environment will involve numerous aspects. Walls (2013) posits that without harnessing the willingness and enthusiasm of involved personnel, even with superior technologies, DevOPS is likely to fail. Accordingly, for high effectiveness in the integration, the ETS company should not resort to coercive implementation; rather, in the initiation stage, employees should be considerably engaged. Throughout the engagement process, employee relationships are strengthened, which helps avoid workplace conflicts (Robbins and Judge, 2003).

This is backed up by Meredith and Mantel Jr (2011) who points out that, involving the personnel in decision-making leads to enhanced compliance levels with suggested changes. While the ETS company's model focuses heavily on project delivery and its clearly delineated stages, the major emphasis for a DevOPS' framework through the collaborative efforts of multiple teams (Loukides, 2012).

In fact, according to Bass et al. (2015), the primary intent of DevOPS is contracting traditional project delivery processes into highly intensive and focused stages. Therefore, when applied to a company's project delivery process, the model will be transformed to allow increased resource sharing between Dev and OPS. For instance, during the planning stage both financial and human project resources input from both OPS and Dev is required. Accordingly, DevOPS will provide a framework that combines input from both units into a single system. This approach will be applied to all stages chosen for an agile environment such that in the end, communication between the two units will be significantly enhanced and team-related project delays will be considerably reduced or eliminated.

2.4.3 Deploying DevOPS

In deploying DevOPS in the company, numerous agile methodologies that enable delivery across multiple teams will be advanced. As noted in Section 2.4.1, central to the agile environment are consumers, and DevOPS allows for a continuous and effective customer-feedback loop. In this case, OPS uses all forms of advanced

DevOPS technologies, for instance, trend projection technology, to obtain consumer-related information, which is then relayed to Dev. In turn, Dev engineers products tailored to the received OPS information.

Additionally, in agile environments, timescale is a critical factor (Eckstein, 2013). Coplien and Bjørnvig (2011) emphasise that delivery cycles must be fixed. Having rigid delivery systems ensures that employees attach urgency to issues and thus work optimally. Therefore, in the integration of DevOPS and subsequent functioning, the personnel will work to fixed timescales.

Furthermore, another agile environment factor that facilitates delivery across multiple teams is iterative production (Boyer and Mili, 2011). Iterations imply that the ETS company will deliver products and enhance them continually over fixed successive periods. According to Boyer and Mili (2011), stepwise development, as opposed to major productions, ensures that, all teams progress coherently in project implementation. Additionally, iterative development ensures business sustainability because it keeps users interested (Boyer and Mili, 2011).

Furthermore, Eckstein (2013) notes that in software development, testing should be conducted throughout the product development lifecycle. Agile environments integrate this aspect as well, such that at every level of the development process, code from various teams is extensively tested (Pham, 2011). Coplien and Bjørnvig (2011) point out that continuous testing helps avoid integration and deployment difficulties.

Furthermore, while agile environment timescales are fixed, Cobb (2012) emphasises the need for completing given development phases before movement to subsequent stages. Developing features fully ensures that comprehensive consumer feedback is obtained, which helps avoid major failures (Cobb, 2012, Wysocki, 2011). Accordingly, completion and fixed timescales are conflicting factors that must be considered in the deployment of DevOPS in the ETS company. One of the ways of ensuring timely delivery is by setting realistic targets that are to be pursued within reasonable timelines (Wysocki, 2011).

2.5 Case Study 2: DevOPS in HP

HP, under Gary Gruver, the LaserJet development director at the time, is a case of a company that implemented DevOPS and was considerably transformed (Zwieback, 2014). Before deployment of DevOPS, the LaserJet team faced numerous difficulties. Chiefly, as noted by Highsmith (2013), while the team comprised of over a thousand globally stationed developers, consumer expectations were not being met because of slow releases. Furthermore, while the company's OPS, (specifically the marketing unit) had numerous ideas on how LaserJet could be enhanced, the Dev team could not effect these suggestions and in turn, this adversely affected company sales volumes (Zwieback, 2014). Furthermore, Highsmith (2013) contends that the situation was worsened by the steady increment of the development team's budget, which, in 2008, increased by over twice that of the previous year. In addition, on the technical side, feedback was very slow and significant time was spent addressing defects rather than working on new products (Highsmith, 2013).

To address these anomalies, the company implemented numerous changes, one of which included DevOPS integration. Zwieback (2014) points out that previously, code development was done in separate entities known as 'branches.' Testing and development related activities were conducted in these coding branches. The company changed this architecture to a single trunk, in which developers were expected to align their code to a single platform (Highsmith, 2013). In addition, Highsmith (2013) notes that the company also developed an automated testing tool that ran continually and pointed out integration defects in developed codes. By implementing these two strategies, integration difficulties were eliminated and time spent on troubleshooting code errors was significantly reduced. Furthermore, by having a unified development trunk, feedback was quickly relayed and therefore, team productivity significantly increased (Highsmith, 2013). Furthermore, Zwieback (2014) points out that the team developed a culture of stopping all coding activities when defects arose. As a result, combined effort in addressing difficulties resulted in quick troubleshooting and continuous development/delivery. Accordingly, the HP LaserJet case is a quintessential example of the impact of DevOPS on team productivity and organisational performance.

2.6 Impact on People and Responsibility

DevOPS integration results in team formation and has a positive impact on people (Walls, 2013). Walls (2013) also contends that the team formation creates a pool of talented individuals, which provides avenues for knowledge and skill transfer. These knowledge management related aspects have been widely attributed to teamwork, whether within organisations or when working with other firms. The transfer process occurs during project planning, development and implementation (Bang et al., 2013), in which employees are considerably engaged. However, given that DevOPS enables teamwork amongst employees working in different departments, knowledge transfer may not have a direct positive impact on organisational functions (Loukides, 2012). In fact, as suggested by Walls (2013), in other instances, the skills shared may not be useful to the other departments. Nonetheless, Walls (2013) and Bang et al. (2013) agree that through the process, employees gain a wider perspective of organisations and how they function, which in turn helps the personnel to make critical observations and provide relevant recommendations for improvement. In addition, Loukides (2012) points out that DevOPS integration is crucial to developing collaborative values within the organisation. The formation of teams implies that organisations appreciate the fact that every individual's contribution is critical to project success. Accordingly, in such highly appreciative working environments, employees are instilled with value for their work and that of colleagues. In turn, with personnel who value their work, employee and organisational performance is significantly enhanced (Wysocki, 2011).

Robbins and Judge (2003) posit that attaching a high value to personnel input significantly motivates employees. Accordingly, DevOPS integration serves to create a highly productive working environment, especially in cases where employee input is welcomed and appreciated. Furthermore, Cooke (2011) points out that because of the rigid delivery models in agile project infrastructure, employee accountability levels significantly improve. Therefore, the formation of teams in DevOPS integrations leads to highly motivated, productive and responsible employees.

The responsibility of teams, in general, has been widely discussed. Particularly, as noted by Certo (2015), the main factors explored in such forums are individual accountability systems, prioritisation of project roles, integration with mainstream

business activities and responsibility delineation. Walls (2013) points out that in DevOPS, the formation of teams instils a group mentality in employees which has both positive and negative impacts for product delivery. Accordingly, as suggested by Kerth (2013), in a situation where there are poor team development strategies, the likelihood of confusion, as regards responsibilities and accountability for failures, will be high. Nonetheless, in DevOPS, this confusion is unlikely to occur because apart from instilling a teamwork spirit, the concept clearly outlines personnel responsibilities such that failures can be attributed to specific persons or groups or personnel (Walls, 2013).

Therefore, while there is active team participation in realising the desired end, members bear responsibility for particular project activities. For instance, as pointed out in the case of HP in Section 2.5, the company developed a value system where individuals could not continue working when defects arose. This aspect emanated from the fact that continued development amid defects led to more complications in later stages (Highsmith, 2013). Therefore, at a personal level, employees were held accountable for failure, albeit indirectly.

Prioritisation is also a major factor when organisations are involved in various projects. Certo (2015) points out that in most cases, team members seek to perform outstandingly in projects to the detriment of their normal organisational duties. Often, these scenarios lead to conflicts between project managers and employee supervisors. As a result, in the integration of agile delivery systems in companies, it is crucial to clearly define the involvement levels of employees in projects and day-to-day company roles (Eckstein, 2013). However, Loukides (2012) points out that in DevOPS integration, such complexities are less likely to arise. Conflicts in project and organisational duties do not exist in DevOPS because rather than being integrated into projects in isolation, the framework is incorporated into the corporate structure such that all functions, whether company or project-related, are defined by DevOPS (Walls, 2013). Accordingly, rather than being viewed as a separate activity, in DevOPS, projects are considered as organisational activities and optimisation within the framework ensures that no entity is negatively affected.

2.7 Organisational Culture in Implementing Change

Organisational culture in change implementation has been extensively explored in the context of employee compliance. The earliest studies of change implementation in the business environment were advanced by Lewin in the 1940s (Benn et al., 2014). Lewin presented the unfreezing moving freezing (UMF) three-stage model (Figure 2.3) to explain how through episodic approaches, high employee compliance with programmes of change could be realised (Zand and Sorensen, 1975). Cameron and Green (2015) emphasise that organisational culture is the driver of such implementations.

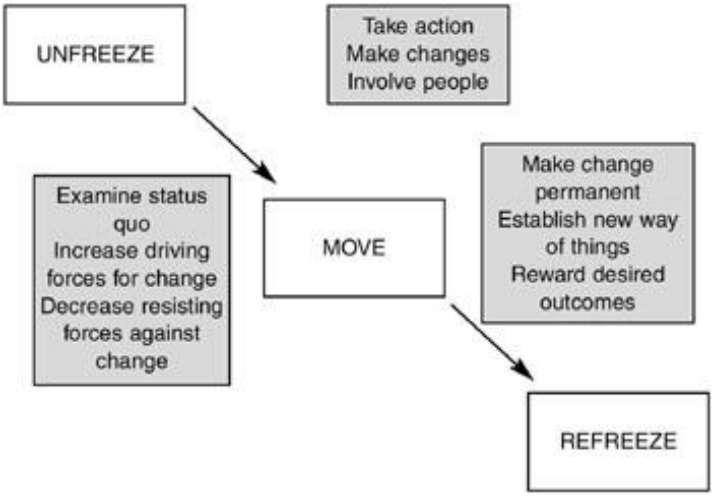

Figure 2.3 – Lewin's Three Step Model (Lewin, 1951)

2.7.1 Lewin Stage One

In UMF, Lewin notes that the first stage involves unfreezing employees (Losch, 2012). According to Benn et al. (2014), this stage is very delicate because the beliefs and values of employees are challenged with the aim of preparing them for change. To successfully undertake the process, involved companies' cultures must be based on openness and high employee support (Robbins and Judge, 2003). Benn et al. (2014) contend that openness is critical to unfreezing employees because with an intolerant corporate culture, a worthwhile exchange that will positively challenge values is unlikely to take place. Furthermore, Cameron and Green (2015) note that organisations with

considerable support for employees are more likely to yield high compliance levels than those with unsupportive environments.

In the unfreezing stage of change implementation, Kotter's model, which is a modern change implementation approach (Kotter and Cohen, 2012, Pollack and Pollack, 2015), is more detailed. The model emphasises that for effectiveness, employees must have a sense of urgency about the change (Smith, 2011). In Kotter's model, to gain employee support, communication about the vision of the change is necessary (Pollack and Pollack, 2015). Accordingly, Kotter's model raises another important aspect related to corporate culture: Leader Member Interaction/Exchange (LMI/X). LMI/X examines communication between the personnel and management (Kotter and Cohen, 2012). According to Boje et al. (2012) organisations that have solid LMI/X support systems achieve high employee compliance levels in change implementation. Accordingly, in the unfreezing stage, where, as mentioned earlier, workforce positions are extensively challenged, organisational culture is crucial to high process effectiveness.

2.7.2 Lewin Stage Two

In the second stage of the Lewin model of organisational change implementation, employees are moved from held positions to new ones. However, when characterised by poor communication, the movement will be more coercive than self-driven, which implies that, in such cases, employee compliance will be low (Cameron and Green, 2015). Boje et al. (2012) note that change implementation bears the risk of failure, particularly when there is low employee compliance. Particular aspects of organisational culture essential to the movement are flexibility and resilience. One of the ways of promoting flexibility, especially in the first stages of change implementation, is treating the first deployment as a testing ground, in which results are benchmarked against desired ideals for consequent optimisation. However, Young (2013) insists that on adopting this approach, organisations must have frameworks that eliminate any form of slackness. Furthermore, corporate systems should be bolstered such that in spite of failure, normal operation continues, which is a strong indicator of resilience (Cameron and Green, 2015).

2.7.3 Lewin Stage Three

Lewin's last stage involves 'freezing' employees to the values of new systems. Many models of implementation change are based on Lewin's assertions. For instance, Kotter's last stage focuses on change consolidation (Kotter and Cohen, 2012), which points to the idea of 'freezing' that was advanced by Lewin. To consolidate the implemented change, numerous aspects must be present in the organisational culture. For high productivity, optimal employee performance and high job satisfaction, among many other factors, changes to improve organisational performance are necessary (Robbins and Judge, 2013). Therefore, to ensure that excellent employee input is continually obtained, Robbins and Judge (2013) suggest that HR practices, for instance, reward systems, appraisal structures and others, must be marked by fairness. Such practices engender stability, which results in low employee turnover and thereby, a continued skill supply for implementing changes (Robbins and Judge, 2013).

2.8 Case Study 3: Google's Structural Changes and Impact on Employees

A good example illustrating the impact of structural change on people is Google. Over the course of its existence, Steiber (2014) notes that the company has made numerous organisational structural changes that were aimed at enhancing worker productivity. For instance, while many firms insist on an eight-hour presence at work throughout the week, Google focuses on the level of individual contribution (Walker, 2011). Furthermore, because of realising the potential technology holds, Google does not insist on worker presence; rather, employees may be permitted to work from anywhere. For instance, as noted by Walker (2011), workers are allowed to spend twenty percent of their time in doing what they like, which translates to a whole day per week. Furthermore, in between work, employees are allowed to receive massages, play games such as volleyball or work out, and all these facilities are within company premises (Steiber, 2014). Besides, Steiber (2014) points out that to enhance communication, the company has adopted a flat organisational structure, where individuals from all tiers interact and share ideas freely.

In turn, Schiemann (2014) points out that the main reason why workers report to Google offices every day is to build on each other's ideas. In addition, before commencing daily duties, workers meet frequently in groups, to share ideas on how to improve shared and individually performed tasks (Bergvall-Kåreborn and Howcroft, 2013). Schiemann (2014) points out that the approach is so productive because in every meeting, employees endeavour to present innovation as a means for improvement. Accordingly, employees are challenged to think continually about ways of improving their performance and that of the team. A notable thing about Google is its appreciation for teams and the commitment to realise high effectiveness in these groups through organisational structural changes. Steiber (2014) notes that Google has built its culture on transparency, in which management shares all company information in weekly question and answer forums, including discussions held at the level of the Board of Directors. Accordingly, with such a level of openness and worker involvement in core organisational functions, in the case of implementing change, personal compliance levels will be high. In addition, the company's structures are deemed as highly flexible. Workers have no particular dress code, are allowed to bring pets to work and may arrive at their convenience (Bergvall-Kåreborn and Howcroft, 2013). Overall, through numerous changes, Google has managed to create fun at the workplace and this has enhanced employee productivity immensely (Steiber, 2014).

2.9 Conclusion

In project delivery methodology, speed, quality of products, high levels of collaboration, company knowledge management processes are some of the aspects used to analyse various methodologies. Many of the current delivery models involve cloud-based technologies, which possess advantages such as remote access, economies of scale, enhanced storage and service virtualisation. Notably, the agile project delivery methodology has gained considerable attention in organisations. The main focus of this methodology is to ensure quick realisation of project goals through effective communication among stakeholders. Particularly, the methodology facilitates communication between the operations and development units. Accordingly, by enhancing collaboration between these units, DevOPs has become a common agile delivery framework in the current business environment.

DevOPS supports collaboration among various teams, real-time sharing, and continuous delivery of results and data analysis among other processes. The model recognises the need to prioritise customers' demands. In particular, the approach strengthens consumers' loyalty through effective communication thereby promoting sales and leading to the realisation of higher profits within firms. Furthermore, by fostering communication, this framework enhances the development of relevant products and facilitates timely delivery of products. Accordingly, the agile project delivery methodology and DevOPS model would enable an organisation to deliver the desired products on time.

However, growing firms find it difficult to adopt DevOPs because they lack the necessary resources to hire highly skilled personnel that are required for optimisation and maintenance of the framework. Besides, most consumer complaints relate to high delivery costs. Therefore, to increase relevancy, the organisation should consider adopting economical models in the development of project delivery models. Furthermore, changes in organisation's project delivery models have strong links to the company's culture. In particular, organisational culture influences employees' compliance to particular methodologies. The process of changing company culture is difficult because it challenges the beliefs and values of employees with the aim of preparing them for change. To effectively realise corporate culture change, organisations need to promote open communication between the management and employees to ensure that workers are properly informed of the need for change and the purpose of such. Furthermore, the management should be supportive of employees' needs such as additional training and flexibility within the work environment.

3 Methodology

3.1 Introduction

This chapter uses some of the research methods demonstrated by Saunders et al. (2007) to produce a research philosophy and strategy appropriate to the study being undertaken. The work of Saunders et al. (2007) is considered a seminal text when deciding on a research method to support the research objectives.

This chapter seeks to provide a brief overview of the various research methodologies and philosophies. This chapter also seeks to provide a justification for the selection of a particular approach. A description of how the research was conducted and the manner in which it was gathered is given, before conducting with a synopsis of ethical considerations pertinent to the research methodology used and the lessons that have been learned by choosing such an approach.

3.2 Company Background

The IT organisation known as ETS chosen to conduct this research is a large ICT shared services company. The ETS company supports multiple lines of business and financial institutions across Europe. It is within the ETS company that this dissertation is focused.

The ETS organisation was formed in 2006 following the acquisition of a UK company. While the individual country business units remained relatively independent of one another, the IT organisation underwent a centralisation programme, moving IT out of the U.K and into Dublin. The centralisation resulted in significant job losses in the U.K and corresponding job growth within Ireland. This is the current ICT shared services model and has been in place since 2006 and supports all the lines of business.

3.3 Purpose of the Research

A more agile IT infrastructure promises to drive new business value, reduce costs and deliver sustainable growth into the future for an enterprise. Yet, to achieve such a transformation, IT organizations must be prepared to review their existing project delivery methodologies, review their IT team structure and understand the potential impact on their employee's.

Currently, the Irish financial institution's new IT organisation called European Technology Services (ETS) runs on a traditional model, which many of their customers have noted as slow and costly. In the last 6 months ETS worked with one of its customers to deliver a project using a different methodology than previously used. Accordingly, recommending a new approach to project delivery that addresses all the raised concerns may prove highly advantageous for ETS.

The purpose of the research proposes to study the impact of changing the company's IT project delivery methodologies. To achieve this, the research paper proposes to analyse the existing project delivery methodology approach and recommend potentially adopting a new methodology or forms of methodologies for the company.

3.3.1 Case Study Organisation Rationale

A case study strategy is adopted for this research as this will enable the researcher to conduct an assessment of methodologies and structures within the ICT shared services company. The ICT shared services company was chosen because it is the researcher's place of employment and this provides easy access for the duration of the research.

The ETS company is structured with production support teams (ETS) who are grouped in to varying silo's based on skillset and a dedicated project resources responsible for the delivery of infrastructure (ETI). The individual lines of business have dedicated development staff and request access to technical resources from ETS.

The ETS company recognised through feedback from its customers the need to improve their ability to deliver rapid infrastructure and services when driven by business demand. The ETS company's Technical Infrastructure (TI) methodology was not suitable to

deliver small and rapid projects which was noted by four interviewees in Section 4.2.1. The ETS company did reduce aspects of the TI methodology to produce the existing European Technical Services Delivery Methodology (EUTSDM) to enhance project delivery speed, see Appendix 8.

Furthermore, this research proposes to study the impact of changing the company's IT structure with the introduction of a permanent DevOps team. The temporary DevOps team known as the Rapid Deployment Unit (RDU) which was formed to deliver project x requires employee's to perform dual roles and responsibilities. The case study also aims to provide an overview of employee's perceptions and concerns with the permanent introduction of a new DevOps team.

Eight senior employees were chosen to participate in the interviews. The participants interviewed were identified as key stakeholders in the in the ETS project delivery, ETS production support and a line of business that has been impacted by project delivery issues. The researcher recognises that the information presented in the case study is applicable to their organisation.

3.4 Research Methodologies

The body of literature related to the selection of research method is broad and a number of prominent contributors to the field have suggested that the research should select a method which best answers the research question, or which best fits the purpose of the research being undertaken (Bryman and Bell, 2015). The decision to select a research method will invariably bring its own advantages and disadvantages. Bryman and Bell (2015) have argued that a researcher cannot summarily exclude a method without having first considered how it could be used to address the aims of the research question being investigated. Saunders et al. (2007) divides the research process into a number of discrete subsections that can assist in deciding on a valid research methodology. In the research onion, there are six layers, namely: Philosophies, Approaches, Strategies, Choices, Time Horizons, Techniques and Procedures.

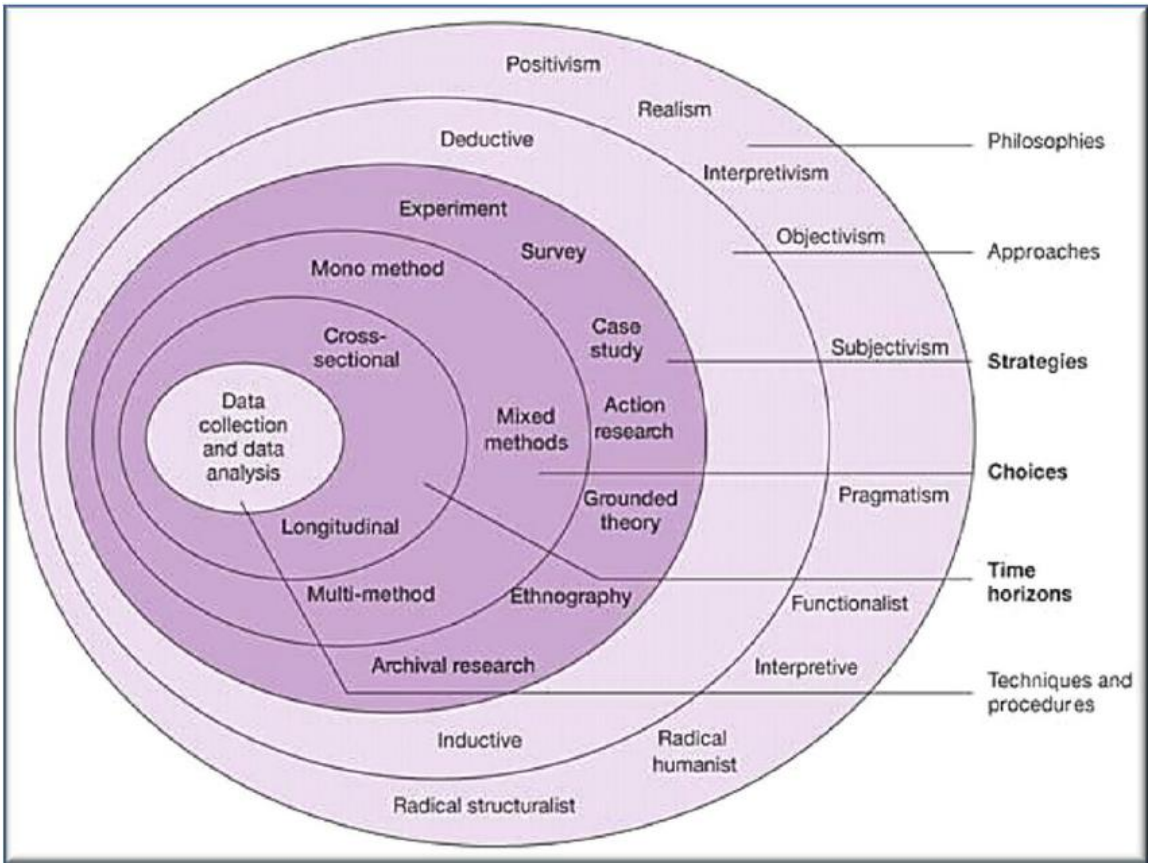

Figure 3.1 – The Research 'Onion' (Saunders et al., 2007)

3.5 Philosophies

A research philosophy can be defined as a researchers own personal view of what constitutes acceptable knowledge and the process by which this is developed (Saunders et al., 2007). The selection of a research philosophy is often dictated by the research question and the personal views of the researcher (Saunders et al., 2007). A research philosophy is also described how the data within the research study is collected, analysed, interpreted and presented (Yin, 2013). The four most common research philosophies used amongst researchers of Information systems are:

1. Positivism
2. Realism
3. Interpretivisim
4. Pragmatism

3.5.1 Positivism

Positivism can be determined as a position that applies natural science methods to the study of social reality Bryman (2015). The positivist approach is usually, but not always, associated with quantitative research methods. According to Saunders et al. (2007) the research is considered to be value free, but by adopting such a philosophy it can be argued that the researcher has already taken a value driven position. Only accurate knowledge acquired through observation, including measurement, is credible.

3.5.2 Realism

According to Saunders et al. (2007) the philosophy of realism is that there is a reality quite independent of the mind. Realism is similar in many respects to positivism however it differs in that it recognises that humans are affected by social forces and processes so cannot be studied in the same manner as natural sciences. Realism also takes the view that there is an external independent reality, separate from individuals perceptions (Bryman and Bell, 2015). Realists take a scientific approach to the collection, analysis and development of data but view their findings as evidence-based probabilities (Guest et al., 2012).

3.5.3 Interpretivisim

Interpretivisim is a very different approach to positivism in that it takes into account social aspects during research process and uses qualitative methods. An Interpretivisim position places emphasis on understanding differences between humans in order to interpret social roles (Saunders et al., 2007). It requires the application of critical thinking to the data and analysis provided, in order to form an opinion. The researcher needs to make sense of subjective meanings expressed about the phenomenon being studied (Saunders et al., 2007).

3.5.4 Pragmatism

The pragmatic philosophy is based on the assumption that no other philosophy meets the requirements of the research and may in fact have a limiting effect on the research process itself. The pragmatic approach places the research question as central and applies all approaches to understanding the question Creswell (2008). Pragmatists often use a mixed method approach and work with both quantitative and qualitative data collection, using different analysis techniques Saunders et al. (2007). Qualitative usually refers to written or spoken word rather than numbers and can also include visual methods like reports, photographs and video (Bryman and Bell, 2015, Saunders et al., 2007).

3.6 Research Approach

According to Bryman (2015), in research, there are two major conventional methodological approaches: deductive and inductive. The two approaches differ on the basis of the steps employed when applied to the research process. The deductive approach begins with formulating hypotheses that then lead to a theory (Matthews and Ross, 2014). Subsequently, the next step taken in the deductive approach is data collection and analysis with the aim of confirming the developed theories (Gray, 2013). On the other hand, the inductive approach does not begin with hypotheses formulation; rather, the approach begins with collecting data, which then leads to theory formulation (Gray, 2013). The approach taken in these methodologies makes a research process either open or narrow (Bryman, 2015). The inductive approach presents many possibilities for the research and allows considerable room for exploration of theories and related concepts (Silverman, 2013). On the other hand, as suggested by Gray (2013), for deductive research, the approach taken is narrow because the researcher collects and analyses data with reference to the formulated hypotheses and theories. Accordingly, Gray (2013) points out that an open approach requires considerable researcher input, which presents avenues for bias and subjectivity. On the other hand, the isolated focus of the deductive approach implies that there is little room for researcher subjectivity. However, it must be noted that should hypotheses be formed without proper consideration, the entire research process will be adversely affected and

thus, when using the deductive approach, a high level of expertise is required (Bryman, 2015).

The main objective of this research was analysing the ETS company's organisational structure and determining if the existing project delivery model will allow for rapid delivery to meet the company's needs. Accordingly, to successfully conduct the research, data relating to the ETS company's project delivery framework has to be first collected and after that, used to inform the development process of the tailored model. Based on these steps, it can be argued that the methodological approach used for this study is inductive. However, in the research, several theories relating to project management and agile delivery are assumed and used to study the ETS company; this process is used to inform the developed agile delivery model of the company. Accordingly, it can also be argued that the research is also deductive. As pointed out by Matthews and Ross (2014), in most studies, the two methodologies can be combined to realise highly relevant results.

3.7 Interviews

A semi-structured interview was designed to gather qualitative data from the sample population. The format chosen was to be semi-structured rather than informal.

3.7.1 Interview Execution and Analysis

Senior employees with knowledge of the company's project delivery methodologies were sought as participants. Eight interviews were conducted in person by the researcher between the 4th and 10th of August 2016.

As per ethical guidelines, participants were provided with the information sheet in advance and an informed consent form was signed by each interviewee on the day. Saunders et al. (2007) indicates that credibility can be promoted by supplying the relevant information to interviewees prior to the interview. Participants were informed that upon agreement interviews would be recorded.

Interviews were manually transcribed from the recording and names were removed to preserve anonymity. These recordings will be destroyed upon completion of the research in October 2016.

3.8 Research Method

Various scholars have categorised scientific research as either quantitative or qualitative (Creswell, 2008, Matthews and Ross, 2014). This research uses qualitative research methods. Qualitative research usually employs in-depth interviews, observations and focus groups in data collection (Punch, 2013).

The quantitative approach allows researchers to test objective theories by statistically examining relations between variables (Davies and Hughes, 2014). On the other hand, as suggested by Creswell (2008), the qualitative design involves attempts to understand the subjective experience of the research participants. According to Davies and Hughes (2014), qualitative research is useful for an in-depth study of particular contexts. The approach is also appropriate for gathering personal participant views on particular subjects. Additionally, Silverman (2013) observes that qualitative descriptions are rich in details because they focus on specific rather than general contexts. Furthermore, Fosnot (2013) argues that the approach allows researchers to exercise flexibility in data collection as the situation may dictate. For instance, researchers can exercise flexibility by adding, excluding or adjusting wordings of interview questions to suit the context. According to Creswell (2008), this flexibility is lacking in quantitative research because the approach mostly uses closed-ended questions. However, qualitative research has various weaknesses. One of the weaknesses is that data is usually collected from a small sample of cases and, therefore, the study results cannot be generalised to a wider context or population. In addition, qualitative research requires more time for data collection and analysis in comparison to the quantitative approach. Matthews and Ross (2014) also state that qualitative research participants may be influenced by the researcher's biases, which can reduce the credibility of findings. Similarly, Ritchie et al. (2013) proposes that the inevitable presence of researchers during data collection can influence respondents and result in subjective findings. Furthermore, the credibility of qualitative research depends on researchers' data collection and interpretation abilities; as a result, the approach can provide misleading conclusions if researcher skills are

lacking. Moreover, qualitative research can create confidentiality challenges during data collection and presentation.

This research employs an interpretivist method, as opposed to a positivist one. The positivist research method reinforces the quantitative methodology (Creswell, 2008). The method emphasises the need for the research process to be objective or detached, whereby the emphasis is on testing hypotheses by measuring variables numerically (Grbich, 2012). This type of research mainly uses experimental designs as opposed to non-experimental ones Creswell (2008). In experimental designs, the researcher is allowed to optimise the research variable while in non-experimental ones, rather than direct manipulation, aspects such as observation are employed to study the variables (Gray, 2013). Therefore, in a positivist approach, there is considerable research variable manipulation. In addition, the data collection techniques in positivist method focus on gathering quantifiable data. Punch (2013) also states that in the positivist approach, empirical conclusions are made through the application of statistical analysis and replication of observable findings. On the contrary, qualitative methodology is supported by interpretivist epistemology and constructivist ontology (Barbour, 2013). The interpretivist method advances that participants' experiences are valuable in explaining phenomena and that this explanation is interpreted through the researcher's perceptions (Yanow and Schwartz-Shea, 2015). Ritchie et al. (2013) also state that researchers using the qualitative approach observe people and their interactions, participate in the activities of the research subjects, interview key people, conduct case studies and analyse existing documents and other cultural artefacts. The aim of qualitative researchers is to obtain the participant’s view of the subject under study (Beuving and de Vries, 2015).

Accordingly, qualitative research employs data collection methods such as interviews, focus group discussions and naturalistic observation. On the contrary, positivist researchers explain behaviour using measurable data that is gathered through highly standardised tools such as questionnaires. Constructivists and interpretivists argue that reality is complex and cannot be studied in a laboratory; instead it can only be understood within its natural setting (Ritchie et al., 2013). Besides, in the interpretivist perspective, the purpose of an investigation is to understand a particular phenomenon rather than generalise to a larger population (Yanow and Schwartz-Shea, 2015). In fact, Gray (2013) states that quantitative researchers seek causal determination, prediction, and generalisation of findings while qualitative researchers seek explanation to similar

situations. Therefore, qualitative methodologies are inductive, whereby they are less concerned with generalising and more focused on deeper comprehension of the research problem in its natural context (Beuving and de Vries, 2015).

In addition, the post-positivist view can also be used to study this research. As pointed out by Cohen et al. (2013), this view came after the positivist method and advances contrary aspects. One of the aspects emphasised in the post-positivist view is realism, where it is noted that science can adequately study aspects outside the researcher's, and by extension, human experience (Cohen et al., 2013). Therefore, the post-positivist view is a major building block of non-experimental research designs. As noted by Gray (2013), the major advantage of the post-positivist view is that it allows extensive exploration of study variables while on the other hand, because of undefined reality limits, high ambiguity is associated with the research process and this could potentially lead to consider able bias. In this research process, the post positivist view is not employed; rather, the agile delivery framework development information will be obtained from the experiences of the ETS company employees.

This research will use semi-structured interviews to collect data. According to Seidman (2013), interviews are preferred for collecting data on participants' history, opinions and experiences, especially when exploring insightful topics. In particular, the research will use semi-structured interviews. According to Rowley (2012), semi-structured interviews allow research participants to describe situations in their preferred way, with the aid of prompts from researchers. Gray (2013) points out that the main objective of semi-structured interviews is to obtain detailed information that can enhance qualitative analysis. Semi-structured interviews include key questions that are used during interviews, although the sequence in which they are asked and level of probing by researchers may vary (Raworth et al., 2012). Moreover, the questions in semi-structured interviews are open-ended. Open-ended questions allow researchers to collect detailed information because respondents can provide additional details that could not be captured by asking closed-ended questions Galletta (2013). Besides, unlike structured interviews, in which researchers cannot collect additional information beyond what the questions require, researchers using semi-structured interviews can omit questions that they regard as redundant or can ask for clarification to understand the participant's experiences and perspectives (Yanow and Schwartz-Shea, 2015). Moreover, the topic guide ensures that the main questions are asked in each interview (Galletta, 2013).

This method allows for flexibility in information sharing because the order of questions is not fixed (Rowley, 2012). According to Ritchie et al. (2013), interviewing techniques should encourage respondents to communicate their attitudes and values. To realise this objective, Barbour (2013) proposes that researchers should establish a rapport with the respondents to encourage sharing of information freely. However, semi-structured interviews require trained interviewers to guide respondents without imposing their views on the research participants (Beuving and de Vries, 2015). Analysis of findings from semi-structured interviews is difficult and must be done by the researchers who conducted the interviews, because it entails interpreting large volumes of data that were recorded in different contexts Creswell (2008). As such, the analysis is time-consuming.

3.9 Ethical Considerations

Any data collected for academic research will have ethical implications. There can be issues in relation to corporate permissions, informed consent, confidentiality and privacy, copyright and intellectual property rights. Ethical approval is required before any studies involving human participants can commence.

The ethical application included a Project Proposal form fully outlining the details of the research and ensured any conflicts of interests were identified. All the relevant documentation was made available to each participant. When the interview questions and the list of participants were finalised an application for ethics approval was submitted to the School of Computer Science and Statistics (SCSS) Research and Ethics Committee on the 11th of June 2016 for approval to carry out the research. After supervisor review and submission approval, permission to proceed with gathering data was received on the 2nd of August 2016 from the Ethics Committee.

3.10 Justification for the Approaches and Methods Chosen

The approaches and methodologies employed for this research were chosen for various reasons. The advantage of applying the deductive methodology when determining the most suitable aspects to include in the ETS company's agile delivery model is that it makes the process focused. As noted in Section 3.7 Interviews, the deductive approach aims to confirm assumed hypotheses and theories and thus narrow the focus of the researcher to given concepts. For this research, the concepts include rapid and simultaneous delivery from multiple teams, collaboration and core project processes enhancement, among others. Having an isolated focus in the research process makes the activity highly effective and leaves little room for researcher bias (Gray, 2013).

On the other hand, as mentioned before, in the development of the ETS agile methodology, an inductive approach is also assumed. A major advantage of the inductive approach is that it allows extensive exploration, which in this research, will help point out all possible structural changes that should be made in the ETS company to support the agile delivery framework. In addition, the qualitative, as opposed to quantitative, research method was chosen for many reasons. As noted before, by capturing non-distinct data, qualitative research presents rich information. Therefore, considering that when making the structural changes in the ETS company, it is important to collect rich information to ensure that the decision-making process is well supported and highly effective.

In addition, semi-structured interviews are used in this process because the availability of participants is limited and thus, by employing them, it will allow access to each respondent within highly flexible timeframes and at their convenience. In addition, the semi-structured interviews allow for personal interaction with every participant, which, as opposed to other research methods, ensures that the respondents are fully engaged through the entire data collection process. Therefore, since interviews allow aspects such as clarification and repetition, the method will ensure that highly reliable information is collected. In addition, through interviewing managers, clarifications will be allowed when receiving crucial information to the development of the agile framework in the ETS company. Given the complex processes associated with the development of agile frameworks, clarifications will be considerably helpful. However, another aspect that makes interviews a preferred qualitative data collection method is the fact that they

are more cost-effective than other qualitative research types, for instance, focused discussion groups. Combing interviews with a case study approach does allow for an in-depth examination of the organisation being studied (Yin, 2013).

3.11 Limitations

However, the approaches employed in this research have various limitations. As noted in Section 3.7, the use of the inductive approach provides wide avenues for researcher bias. However, by using the deductive approach to inform the best agile delivery measures to take, room for subjectivity is considerably lowered. Therefore, the deductive approach counteracts the drawbacks of the inductive approach. In addition, as mentioned earlier, the use of qualitative, and particularly, semi-structured interviews, provides research flexibility.

However, because of the high flexibility associated with semi-structured interviews, collected data becomes difficult to analyse. Complexity in collected data can potentially lead to failure of the entire research process (Punch, 2013). As noted by Galletta (2013), the effectiveness of interviews, and especially semi-structured ones, depends considerably on the expertise of the researcher. In addition, as pointed out in the discussion, an interpretivist method will be adopted when analysing the responses of the interviews.

According to Gray (2013) this method allows substantial input from the researcher and therefore, could potentially lead to biased interpretations. These, among other limitations, require the researcher to institute various counteractive measures. Creswell (2008) points out that to reduce researcher bias, a second independent party should be included to assess the objectivity of the entire process. Furthermore, considering that semi-structured interviews will be used in this research, which could lead to irrelevant discussions during the data collection process, the questions should be arranged such that they build on each other. Otherwise, if not strategically arranged, collected data will be considerably difficult to analyse (Seidman, 2013). Nonetheless, a major solution to potential data complexity is using aids, for instance, video and voice records, which will allow research responses reviews during analysis.

Furthermore, the use of a case study on one organisation doesn't allow for validation and triangulation. Triangulation enables the use of multiple data sources to bring additional findings (Bloomberg and Volpe, 2015). Given additional time, the use of a multiple case study approach would be considered to include more ICT shared services organisations.

3.12 Research Tool Chosen

This research used the QDA Miner Software to code and analyse qualitative data from interviews. According to Silver and Lewins (2014), the software can also be used to code, retrieve and analyse interview or focus group transcripts, speeches, journal articles, drawings, and photographs among other documents. The tool also enables researchers to code documents quickly and reliably (Peh and Low, 2013) . While some analysis tools for qualitative data offer a single text search tool for extracting sentences or paragraphs containing particular words, QDA Miner provides more search and retrieval tools; enabling researchers to attain more reliable coding within a short time (Fielding, 2012). Furthermore, the software supports statistical functions such as coding frequencies and sequences (Peh and Low, 2013). Moreover, (Silver and Lewins, 2014) state that the tool allows storage of queries and research results in a central location. These results can be in the form of tables, graphs, quotes, and research notes among other formats that can be included in the final report. Therefore, the tool enables quick identification of trends and patterns thereby facilitating hypotheses testing.

3.13 Conclusion

This research employs an interpretivist method, as opposed to a positivist one which influenced the research approach and data collection methods used. As noted in Section 3.7, elements of deductive and inductive approaches were used. The deductive approach aimed to confirm the hypotheses and theories thus narrowing the researchers focus. On the other hand a major advantage of using an inductive approach is that it allows extensive exploration, which in this research will help point out possible structural changes that the organisation may want to adopt.

In addition, the qualitative, as opposed to quantitative, research method was chosen for many reasons. By capturing non-distinct data, qualitative research presents rich information. The findings of the research are obtained through qualitative analysis of the data collected via the semi-structured interviews and literature review. The semi-structured interview questions were formulated based on existing literature, in order to gather the impact of agile mythologies on project delivery and the organisation's people. These findings and analysis of the research paper are presented in Chapter 4

4 Findings and Analysis

4.1 Introduction

This chapter presents the research data, which was collected using semi-structured interviews, and its analysis. The first section of this chapter presents the profile of the research participants. In the second section, the data is presented under various themes. The first theme is the perception of interviewees on whether the current company's methodology allows for agile or rapid delivery. In the second theme, the research presents participant responses on what they felt were the main success drivers for a recently completed project. The third theme explores whether changes were made to the companies methodologies to help implement a recently successfully completed project. Similar to the third theme, in the fourth, the changes made to organisational team structures to help effectively undertake this project are the central focus. In the fifth, the participant's position regarding the HR models employed to help integrate project teams is presented. In the sixth theme, the participant's responses on what DevOPS entails and its necessity in the company are presented.

Throughout these themes, the members' perception on how the corporate culture influences rapid delivery and teamwork has been covered, in which factors such as organisational change, corporate communication and employee training, among others, as perceived by the interviewees, are widely explored. The third section critically analyses this data with the aim of determining whether the current methodology will allow for rapid/agile delivery and the company's need for a DevOPS team, and lastly, outlining the concerns from production teams about rapid delivery support. In addition, besides achieving the research's main objectives, the analysis will also help determine the study's minor objectives that include the organisational factors involved in the delivery model of the ETS company, formation process of a new DevOPS and RDU team and the impact of the RDU on people.

No.	Participant Name	Role in the Company
1	**Interviewee A**	Project manager of the infrastructure team- spearheading the Cyber programmes, organising the bigger infrastructure-related company projects, and tasked with leading the RDU Currently: Working on the extensions of the project x that was recently completed
2	**Interviewee B**	HR business partner for the IS (Information Systems) function, which is a European function that oversees HR-related activities across all of groups and companies that participated in the delivery of project x.
3	**Interviewee C**	Manager of European technology integrations (ETI) team and specifically, the computing and storage team Responsible for the delivery of the European Infrastructure to projects including project x and leads a team of 14 to 15 people.
4	**Interviewee D**	Manager on the European Technology Services (ETS) or infrastructure side and is responsible for the delivery of development and test environments for multiple lines of business.
5	**Interviewee E**	Team member in the BAU (Business-As-Usual) (or Server Intel) team in the ETS company The BAU team maintains and provides infrastructural support for the company's Windows servers.
6	**Interviewee F**	Head of the IS unit for corporate business. Provides strategic direction of IS and overall operations management for corporate business IT, in which the central focus is innovation.
7	**Interviewee G**	Leader of the Intel server team and runs the production environment for any Intel servers and any of the Microsoft stack
8	**Interviewee H**	Project manager in corporate business and responsible for the delivery of development for project x programme in the long-term

Table 4.1 – Participant Profile

4.2 Data and Theme Presentation

4.2.1 Perceptions on whether Current Methodology allows for Rapid Delivery

This theme helps to realise the main objective of the research. Determining the participants' views on the company's current methodology and its influence on agile delivery will provide pointers that will help to formulate effective suggestions on how rapid project delivery can be realised in the company.

Seven out of the eight participants were asked this question. The only participant that did not provide their views on this question is Interviewee B because they are not directly involved in any project delivery-related activity; rather, they are a HR head. The collected data on this theme is summarised in Figure 1 below:

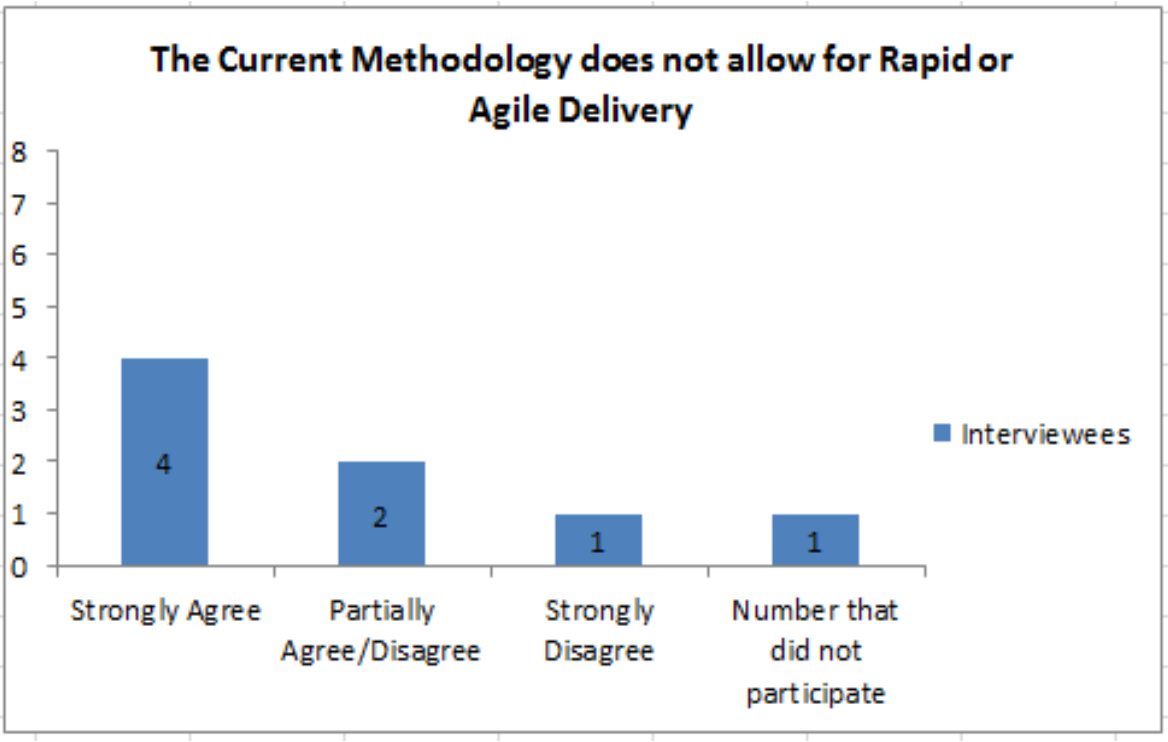

Figure 4.1: Support of Current Methodology for rapid/agile delivery

Of the seven, four interviewees strongly indicated that the current methodology did not allow for agile delivery. A major reason that was cited for this position is that the company's current EUTSDM methodology is rigid and did not allow for rapid scalability, and this required to be reworked. In addition, this group also pointed out when using the current company's methodology, the costs incurred to conduct a small or large project was similar and therefore, for smaller projects, the price was high. Furthermore, it took the same amount of days to conclude projects, regardless of their size. Accordingly, based on these factors, this group strongly held the view that the current methodology of the company cannot support rapid or agile delivery.

On the other hand, two interviewees had a mixed reaction to the question of whether the company's current methodology could support agile or rapid delivery. This group argued that the company's current EUTSDM methodology involved numerous stages that were crucial to ensuring that purposeful changes are made - most especially when remodelling the network core. However, the methodology could significantly slow delivery of the application side, which, for effectiveness, requires agile frameworks. Regardless, this group points out that more changes must be made to realise a methodology that supports rapid delivery.

Lastly, one participant felt strongly that the company's current methodology supported agile or rapid delivery. The participant noted that when tailored to the needs of given projects, the company's current methodology could allow rapid delivery. In particular, the participant pointed out that the tailoring process should especially be conducted on the project charter and requirements documents. Nonetheless, the participants point out that collaboration between teams and the use of agile frameworks is essential in the tailoring process, which could imply that these are lacking in the current methodology.

4.2.2 Main Drivers of Project Success

Determining the main factors that led to the success of a recently concluded project, which involved the employment of a wide range of IS strategies, will help identify aspects crucial to obtaining favourable outcomes in future company projects.

Of the eight participants, six interviewees were directly asked this question and, as in the first theme, the interview with Interviewee B focused on HR issues. On the other

hand, interviewee E did not directly participate in responding to this question but shared information related to the project's main drivers, which would be important in the analysis stage.

Numerous reasons were cited to have led to the success of the project. These reasons include collaboration, use of agile methodology, tight timelines, a customer-centred approach, timely access to resources, and frequent meetings as illustrated in Figure 4.2:

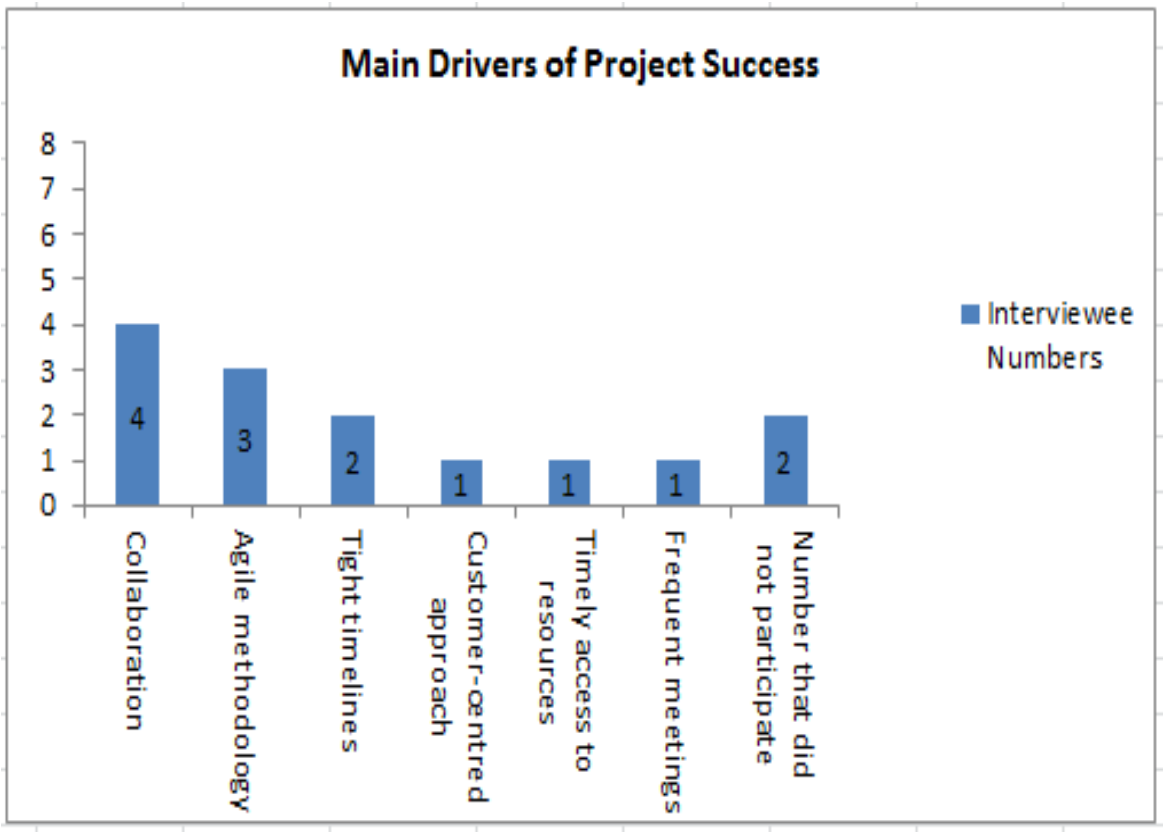

Figure 4.2: Main drivers of Project Success

Of the six that responded directly to this question, four interviewees suggested that collaboration was the main the driver of success for the projects. In particular, the respondents suggested that cooperation between the development and operations department enabled team members to identify appropriate solutions and deliver timely results. Another significant success factor is the use of the agile methodology. Three respondents noted that the use of agile methodology enabled the organisation to reduce unnecessary processes and thereby deliver required products on time. Furthermore,

two interviewees suggested that tight timelines compelled the stakeholders to cooperate and act promptly during the project implementation process.

Another aspect mentioned for contributing to the projects' success included the use of an outside-in customer-oriented approach in which consumer views were given pre-eminence. Additionally, adequate preparation, in which the development team had timely access to project resources (ETI), and frequent meetings to discuss strategies for successful completion of the project were noted as driving project x's success.

4.2.3 Changes to methodologies in conducting the successful project

Additionally, the respondents were asked whether they were aware of any changes to the methodology used during project implementation. Identifying these changes will help to determine whether the new methodology addressed all the concerns raised. Additionally, the responses to this question will demonstrate the impact of changing the company's IT project delivery methodologies and especially with reference to the TI, EUTDSM and newly introduced agile methodology. Furthermore, the findings from this question will be used to analyse the impact of the company's culture on change execution and in turn, this knowledge can be used to propose an appropriate project delivery model for the company.

The research obtained direct responses from all the respondents except the HR personnel, who could not identify a particular methodology in the company's project delivery process. Several methodological changes were identified and are summarised in Figure 4.3:

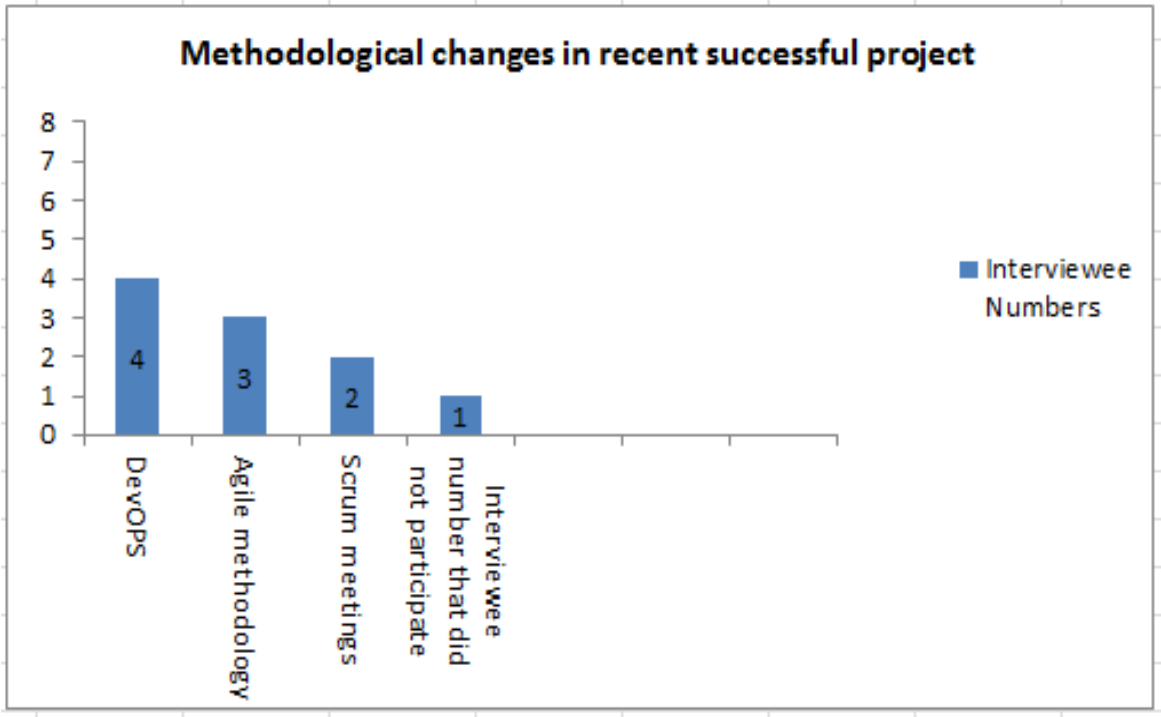

Figure 4.3: Methodological changes in the recent successful project

Figure 4.3 shows that the highest number of respondents (four) observed that the methodological change involved the use of the DevOPS approach. As noted by the interviewees, this approach enabled the production and design departments to work as a team in the delivery of the project. Moreover, the collaboration enabled the development and operation units to assign resources appropriately, develop quality and relevant products as well as make timely delivery. Additionally, three respondents identified the introduction of scrum meetings as a major methodological change. As noted by these participants, in these meetings, project team members met to discuss resource requirements and to identify solutions to potential challenges for every milestone. The daily meetings served to strengthen cooperation among team members. In addition, three research participants identified the introduction of the agile methodology as a significant change in the company's project delivery approaches. The benefits of the agile methodology, according to this group, included early identification of success barriers and quick response to change. Notably, one respondent pointed out that the agile methodology involved a change in the employees' mind-set, which demonstrates that there is a link between methodological changes and the corporate culture, as will be discussed in the Section 4.3.

4.2.4 Changes to Team Structures in a recent successful project

Furthermore, the research sought to determine the changes to team structures in a recently concluded project. By asking respondents whether there were changes in the team structures, the impact of introducing a DevOPS team would be determined. Accordingly, the response to this question will help to identify relevant solutions to the organisation's current structure.

Six interviewees responded to this question, in which they identified two major changes to team structures, as shown in Figure 4.4. Of the two respondents that did not respond directly to this question, one interviewee pointed out that the involvement of the operation team in the design stage and formation of RDU were among the changes in the organisation but did not specify the structural changes involved. The HR personnel did not identify any specific structural changes to teams. Figure 4.4 shows the results for team structure changes within the organisation:

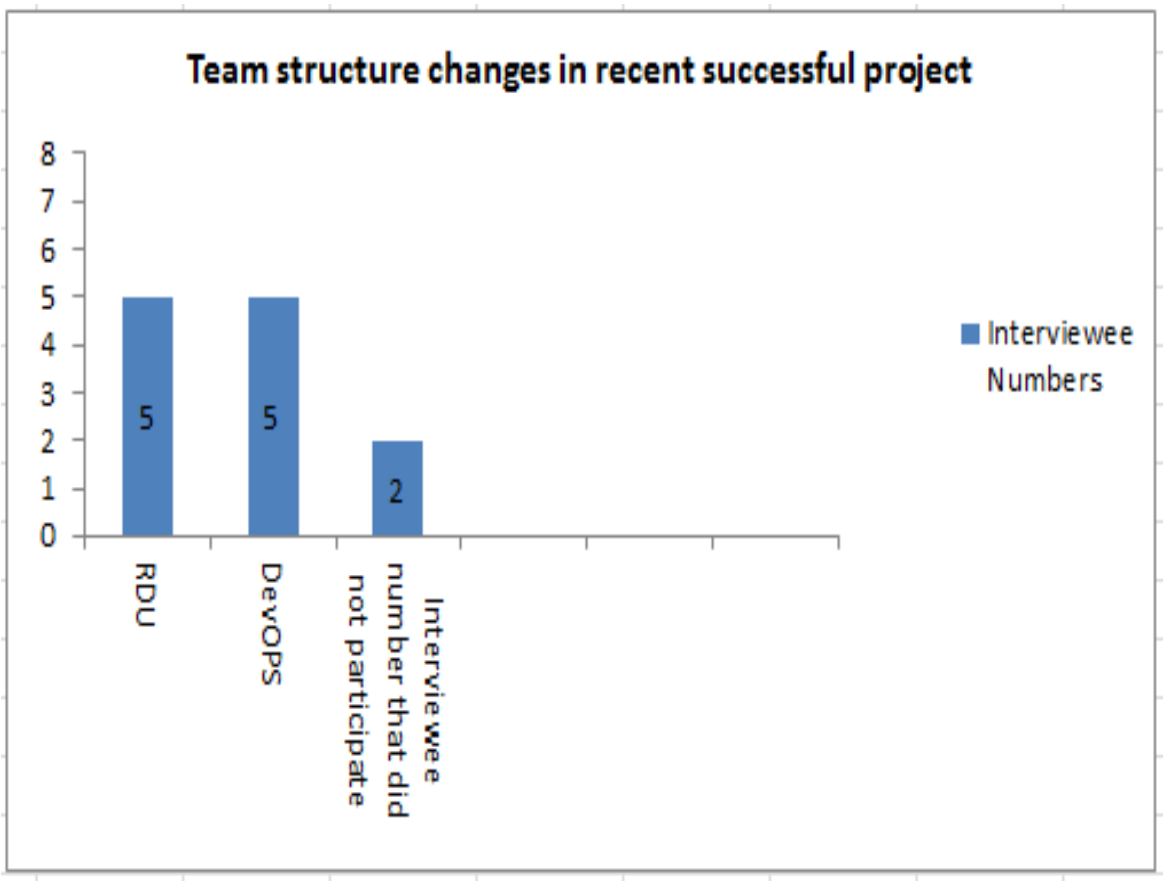

Figure 4.4: Changes to the Team Structure

As illustrated in Figure 4.4, five interviewees identified the formation of RDUs and DevOPS as the major changes to team structures in the recently finished project. Both teams held scrum meetings twice a week to identify barriers and formulate delivery strategies. As noted in Section 2,3, BT also adopted the Scrum framework to ensure targets were met within set periods and to enable fast delivery of multiple projects (Cooke, 2011, Heim, 2013).

4.2.5 Employment of particular HR Models

In addition, the research sought to determine the HR models that are used to achieve a favourable culture and promote team integration. The identification of these models would be helpful in determining whether HR is supportive of project delivery changes within the organisation. As already indicated in this report, HR models affect employees' perceptions of change and, therefore, influences their compliance with change considerably. The interviews with the company representatives demonstrate that the organisation lacks clearly distinguishable HR models.

An indicator of the above would be that of the eight interviewees, none identified a particular model; instead, some respondents attempted to describe their respective perception of the organisation's HR model. Seven of the interviewees stated clearly that could not identify any particular HR model while one (the HR representative) described an existing situation that she considered as a model. Figure 4.5 illustrates these findings:

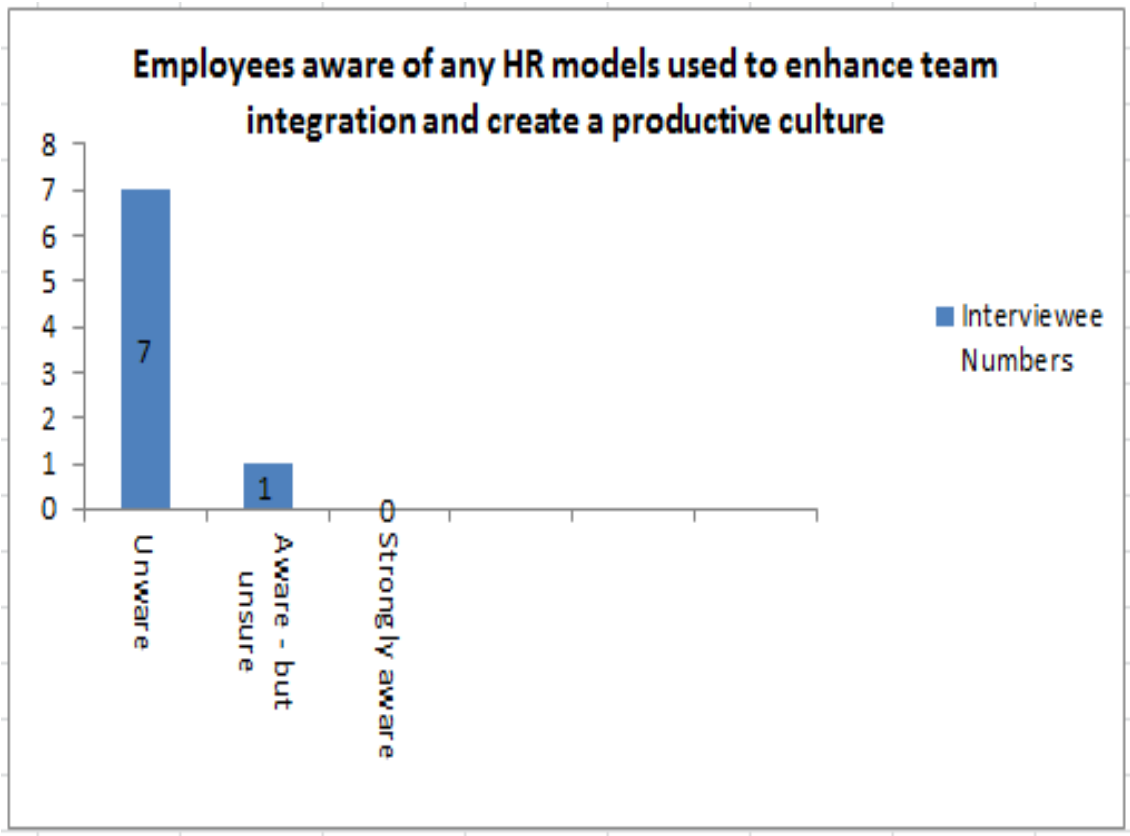

Figure 4.5: Number of Employees that Identified Existence of an HR model

Although the HR representative could not specify the model in use within the firm, the respondent highlighted an important aspect of the link between employees' experiences, beliefs and actions. According to the HR representative, employees' experiences within the firm determine their attitude towards change, thereby affecting their actions.

While the interviewees indicate that the company lacked a clearly identifiable HR model, they highlighted potential benefits of introducing such models as illustrated in Figure 4.6:

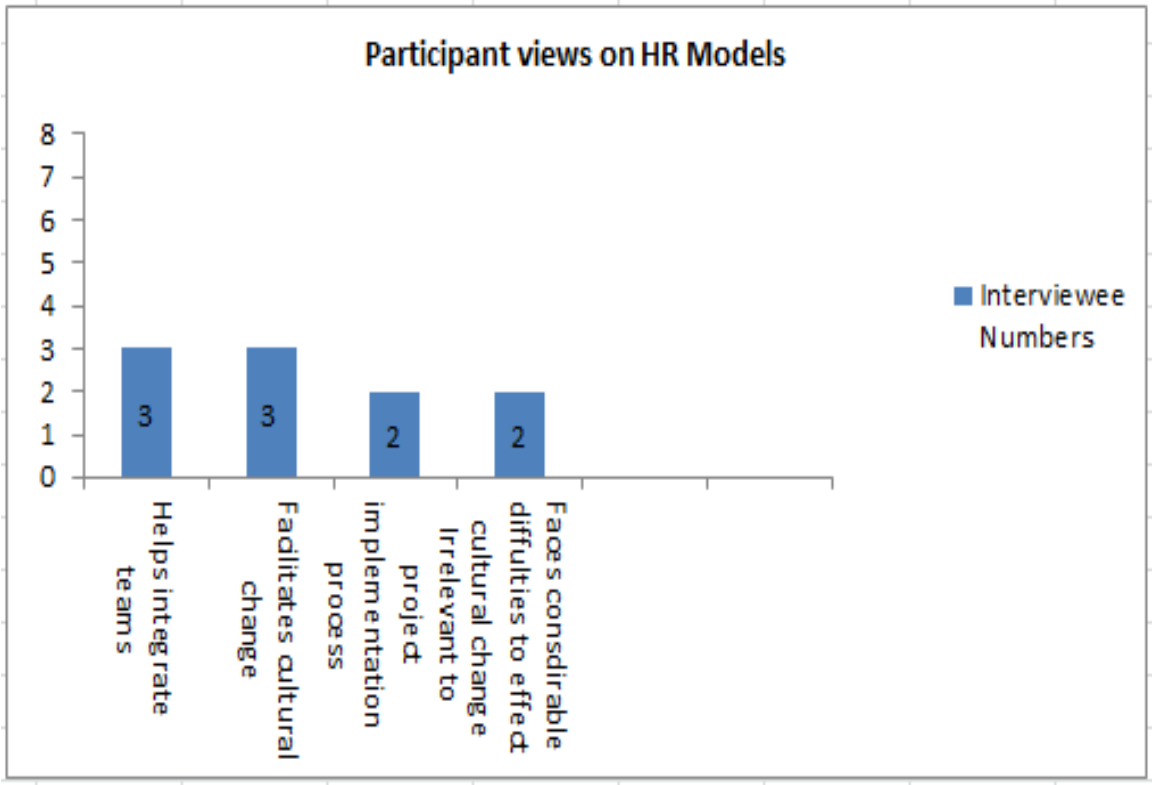

Figure 4.6: Potential Benefits of HR models

Figure 4.6 shows that three employees proposed that such models would be useful to integrate different teams. Moreover, three interviewees suggested that HR models would facilitate the realisation of desirable cultural changes. However, two interviewees pointed out that cultural change is difficult to realise and require effort and time. Another category (two respondents) does not consider such models relevant to project implementation.

4.2.6 Understanding of DevOPS and its introduction in the company

Additionally, the research aimed to find out the interviewees' understanding of DevOPS and its need in the organisation. All respondents demonstrated a considerable understanding of the term DevOPS. The participants pointed out that the concept referred to the integration or collaboration between various corporate units to deliver project outcomes. Furthermore, the interviewees were asked about the implications of permanently adopting the DevOPS model. The response to this question would help identify any concerns surrounding the integration of this model.

Of the eight interviewees, seven responded to this question. One argued that a permanent DevOPS team would not increase efficiency in project delivery while six supported the idea of establishing a permanent DevOPS team as shown in Figure 4.7:

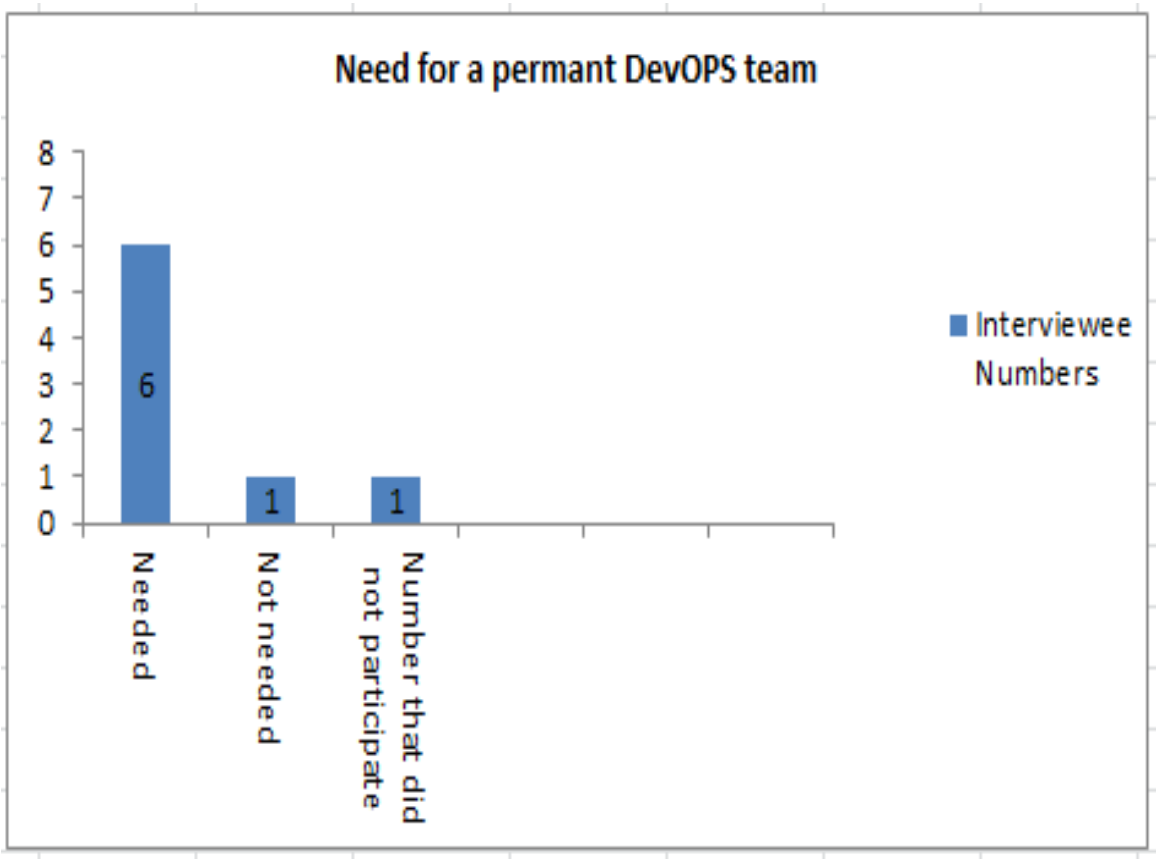

Figure 4.7: The Need to Create a Permanent DevOPS Team

The respondents that opposed this suggestion argued that such an approach would prove inefficient as regards resource use because the organisation would need to form multiple DevOPS teams to handle different projects. On the other hand, the respondents in support of a permanent DevOPS team proposed that such a move would lead to timely delivery of products because it cuts unnecessary processes and reduces misunderstandings between the operations and development units. In addition, permanent adoption could potentially eliminate conflicting work demands for DevOPS team members that have to meet their standard and sometimes mundane obligations while serving as unit representative in more dynamic DevOPS team.

Although five respondents agreed that the creation of a permanent DevOPS team would prove successful, three of them raised some concerns. One of these concerns was that by seeking to achieve results quickly, this approach presented the risk of

overlooking important processes that ensure adherence to product standards and controls and therefore, the approach would require highly skilled employees that could handle complex tasks while possessing considerable experience and knowledge of the risks involved in rapid project delivery. Furthermore, one respondent noted that the selected member for a permanent DevOPS team might not receive support from their respective units because the employee would be considered to be more important and skilled than other members. Another interviewee proposed that the success of such a team would depend on the organisational culture and therefore their willingness or indeed the incentive alignment of the operations and development units to move at the same pace. Nonetheless, the five respondents agreed that a permanent DevOPS team would be beneficial for the organisation.

Based on these aspects, it can be concluded that on the question of whether a permanent DevOPS team should be adopted, one disagreed, three agreed, and three strongly agreed, as illustrated in Figure 4.8.

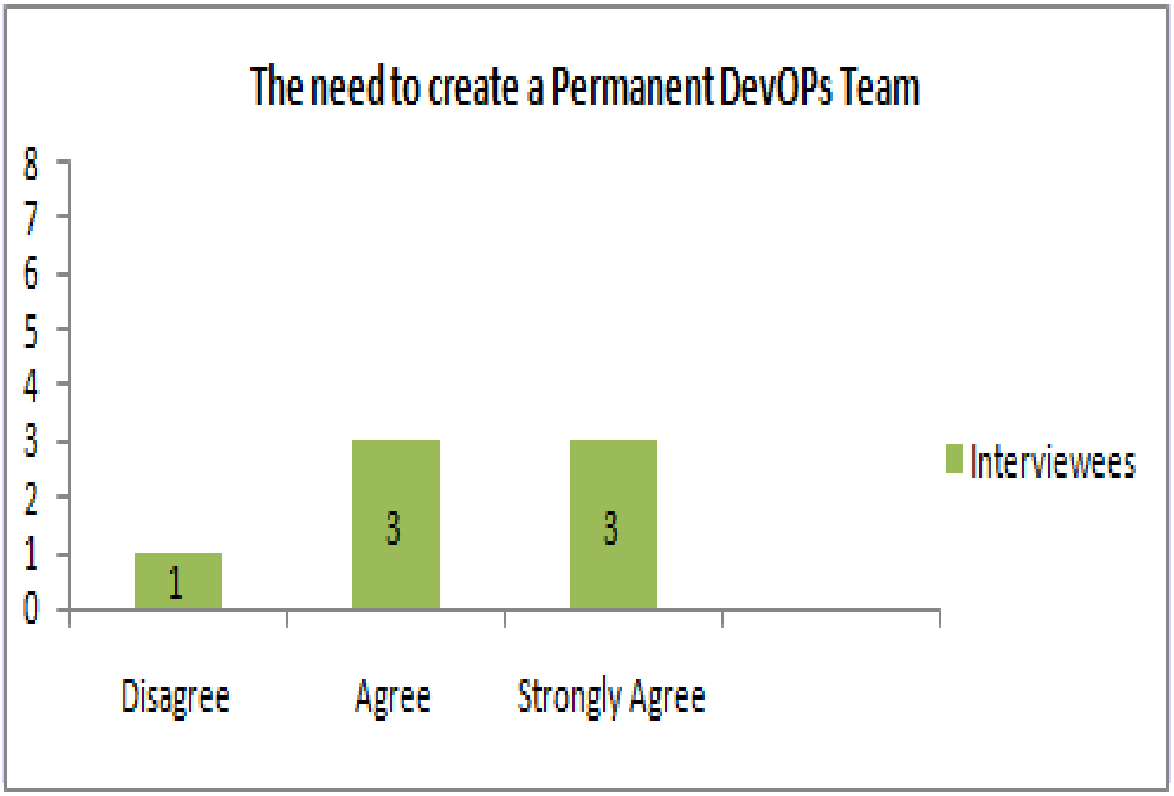

Figure 4.8: Perceptions of the need to have a Permanent DevOPs Team

4.3 Data Analysis

From the data presented above, numerous aspects that are important to realising the objectives of this study are made apparent. The major issues raised can be analysed in three broad categories as listed below:

- The support of current methodologies for agile delivery
- Major organisational issues within the corporate framework that do not allow for rapid delivery
- The role of a DevOPS team in the ETS company

4.3.1 Support of Current Methodologies for Agile Delivery

From the collected data and data presented in Figure 4.1, fifty percent of the participants strongly felt that the current methodology of the company did not allow for rapid delivery. Presently, the ETS company uses the EUTDSM methodology which was morphed from a previous TI methodology to reduce project delivery times (Section 3.3.1). As noted by the interviewees, this methodology involves numerous processes, whose effects can be further hampered by organisational bureaucracies. Accordingly, when employed in the delivery of projects, EUTDSM methodologies require the implementation team to invest considerable efforts in pushing involved agenda, and this act diverts employee attention from main corporate duties and could potentially lead to conflicts - most especially when unfavourable outcomes are obtained (Wysocki, 2011). However, as noted by another group the numerous stages associated with the EUTDSM methodology are beneficial to ensuring that changes affecting core areas within corporations are made diligently.

Accordingly, based on the fact the EUTDSM methodology enables clarity in making decisions, two of the interviewees noted that it is beneficial despite slowing delivery on the application side. However, based on the collected data, the views of this second group could be influenced considerably by the ambiguity that the members have about how agile delivery is defined. By holding the position that EUTSDM methodologies enable diligence and therefore, in spite of not supporting rapid delivery, are beneficial, this group implies that agile frameworks lack systems that promote accountability and

proper decision-making. In fact, as noted by one of the interviewees, considerable training in order to educate these misconceptions about agile delivery. Nonetheless, this group still emphasised the need to undertake more changes that are strategically geared towards supporting rapid delivery in the company.

In addition, a major factor notable from the discussion on current methodologies in the company and support for rapid delivery is the third groups view that when tailored to particular projects, EUTDSM could help to achieve agile delivery. In fact, the same position is apparent from the research on the main drivers of project x's success. A wide range of factors that include enhanced team collaboration, tighter deadlines, scrum meetings and agile frameworks, among others, are suggested as to have led to the success of project x; accordingly, these changes justify the position held by this group. However, the collected data suggest that the idea that the company's current methodology could support rapid delivery is perhaps incorrect. By emphasising the need to tailor the methodology to certain projects, the group seems to suggest that on its own, the project implementation approach being used by the company can support rapid delivery. However, the group's questionable view is backed by an assertion that the tailoring process should involve the introduction of agile frameworks and systems that enhance team integration. As suggested in Section 2.2.2, the act of introducing agile delivery systems to the project implementation process is very delicate and in fact, in extreme cases, can lead to an overhaul of the existing corporate structure (Cobb, 2012, Pham, 2011). Therefore, while this group seems to suggest a subtle approach to addressing the current methodology's failure to support rapid delivery, the main thrust of their argument, although contradictory, is that the company lacks agile project delivery frameworks.

In addition, from the interviews on the changes made to company methodologies and team structures to ensure that project x succeeded, numerous aspects arise that could help to inform the main research objective. Seven interviewees felt that the major methodological change that was enabled to ensure project x success was the morphing of the TI methodology to EUTDSM and finally, to agile, during the project's lifecycle.

Other factors pointed out by the group are the inclusion of the operations team in the design stage of applications, change of the personnel's mind-set regarding various aspects of the agile methodology, ETI area modifications. In addition, one of the main team structural changes pointed out by five of the interviewees is the establishment of RDUs and a wide range of related aspects in the implementation process of the project.

All these changes concur strongly with Section 2.2.2, in which it is shown that to establish rapid delivery systems, project teams should only focus on core implementation processes (Collier, 2011, Poppendieck and Cusumano, 2012). Accordingly, this information shows that introduction of agile approaches to the company's team structures and methodology led to the success of project x, which will now be used as a benchmark for future projects.

Therefore, from this research, a primary aspect that is apparent is that the ETS company's current methodology cannot support rapid delivery and therefore, to ensure success in future projects, the methodological changes that have been made must be sustained or improved over time.

4.3.2 Organisational issues within the corporate framework that do not allow for rapid delivery

As pointed out in Section 2.7, organisational culture has a considerable influence on the success of projects and on employee motivation. Griffin and Moorhead (2011) concur with this observation by noting that organisational culture has a huge impact on employee job satisfaction, which has a strong linkage to their motivation. However, if the company's culture is noted as being rigid, which, as noted in Section 2.7, implies that company's systems are not structured to adapt quickly to change (Cooke, 2011). Accordingly, with such a culture, evolution, which as suggested by Anderson et al. (2015) is critical to business survival in a VUCA market, is harder to achieve. Furthermore, this rigidity ends up affecting all organisational aspects, particularly projects, which may be in the case of the ETS Company.

As pointed out in Section 2.7, in businesses marked with rigid systems, for projects to be implemented within set timelines, involved team managers have to spend considerable efforts on pushing their project agenda because of unavoidable corporate bureaucracies (Meredith and Mantel Jr, 2011). Furthermore, in rigid systems, while there is detailed scrutiny for every assignment embarked upon, productivity is undermined considerably by the length of time spent to assess every activity to be undertaken(Wysocki, 2011). However, Meredith and Mantel Jr (2011) point out that

rigid systems are generally beneficial to activities that are deemed sensitive or delicate, and which, when improperly undertaken, could adversely affect business operation.

However, for the ETS company, rigidity in delivery methodologies is simply unnecessary because, with modern technology, IS-related problems can be readily detected at early stages and corrected. In fact, most IS-related projects are highly modularised, such that a sectional problem in a given part of the project is unlikely to significantly affect other modules. Therefore, the organisational culture of the company should be remodelled over time through a series of policy changes and strategic corporate restructuring mechanisms to allow flexibility and evolution, thus enabling a supportive production environment.

In addition, rigidity in the company has led to cost-related production concerns. As noted by the interviewees, when using the company's current methodology, the cost incurred to undertake a project, regardless of the size, is the same. Accordingly, this may lead to deterring capital investment in small but valuable projects in order for the company to see a greater relative return on a perhaps "value-ambiguous" larger project. Should smaller projects be undertaken continually, the probability of making losses as a result of fixed operational costs is high. Wysocki (2011) points out that corporate systems should be structured such that every company resource can be easily scaled down or up to fit client demands. As pointed out in Section 2.2, the use of modern technologies to undertake projects has allowed organisational processes to be highly scalable, which could not be achieved by traditional systems (Wysocki, 2011).

Accordingly, the company should transition from using traditional methodologies to modern approaches such as rapid delivery frameworks. According to Turner (2016), a core feature of rapid project delivery structures is scalability, where resources are easily matched with project demands to enable cost-effectiveness, high implementation flexibility and timely delivery. Therefore, the issue of costly project undertakings could be addressed by strengthening the company's bid to have a rapid delivery structure and thus enable an environment that supports cost-efficient production, regardless of size.

The company's organisational culture is also apparently negatively affecting the integration efforts of teams. The company's culture does not equip employees with a wide range of skills; rather, individuals are encouraged to specialise within a given domain and pursue it while lacking the knowledge of how other related entities function. Horwitch (2013) points out that modern technologies involve an integration of a wide

range of systems; in fact, high compatibility is often stressed for technological productions aiming to survive market upheavals. Therefore, understanding how a wide range of technologies are integrated to improve data transmission and business processes is a critical qualification for experts in this industry. Individuals who are equipped with extensive knowledge on how various systems are integrated, often make the best managers and be well equipped to form effective teams to undertake IS-related projects (Horwitch, 2013). However, the culture in the ETS company may not support a knowledge management framework that could allow learning and skill exchange on aspects beyond an employee's specialisation. As pointed out in Section 2.6, strong knowledge management frameworks have a huge positive impact on workers (Loukides, 2012, Walls, 2013). In fact, this concern was raised by a group of interviewees who felt that effective DevOPS teams could only be constituted of individuals having wide-ranging knowledge and experience, but because of the ETS company's knowledge sharing culture, will have to be developed over time. Therefore, to support rapid delivery, this concern must be addressed.

In addition, HR models are also another major production concern. From the interviews conducted, none of the interviewees are aware of any clearly-defined HR model employed to integrate teams and realise a favourable culture for production. Only one interviewee, who works in the HR department, compared the model to a pyramid. However they still felt the model was perhaps unsubstantiated. Accordingly, this is a strong indication of the HR division's inactive involvement in realising a culture that supports the proposed developmental agenda of the organisation and by extension, production endeavours.

Griffin and Moorhead (2011) point out that the HR department is central to establishing a culture that enables high employee and organisational productivity. As pointed out in Section 2.4.2, the HR unit influences employee performance by formulating policies that drive the personnel to achieving set targets, while promoting the developed model among workers to ensure that all are actively involved (Robbins and Judge, 2003). In the case of ETS, there is little awareness among senior employees of the HR models employed to achieve a productive culture and only individuals in the HR department have a more nuanced view about these models. Accordingly, there is a need to involve the HR department actively in shaping a culture that supports team integration and rapid production.

Closely related to HR models and the role of the HR department in realising a supportive rapid production environment is organisational change and employee compliance, which is widely explored in the Section 2.6. Considering that DevOPS and agile delivery have just been recently introduced in the company, the two aspects involve significant changes to the organisation's approach to project delivery. Therefore, as noted in Section 2.7, for effectiveness, there is a real need to shift employee attitudes and perceptions to positions that would favour the optimal performance of DevOPS teams and agile frameworks (Cameron and Green, 2015). Benn et al. (2014) point out that the process of moving the personnel from one mental inclination to another is very delicate and when improperly conducted, could potentially lead to adverse effects such as low job satisfaction, commitment and ultimately high employee turnover,

Three of the interviewees noted that training employees about DevOPS, rapid delivery and their related concepts, could lead the personnel to be more engaged team members and would therefore appreciate the introduction of the two approaches to the company's project delivery processes. Some of the models the organisation could use, as suggested in Section 2.7, include the Lewin's or Kotter's change models (Boje et al., 2012, Kotter and Cohen, 2012). Training the employees will equip them with qualities that allow optimal performance in a rapid environment and the activity will also make them comply with the changes presented by agile frameworks.

Another major concern that directly affects rapid delivery is communication. As noted in Section 2.7.1, communication aspects such as LMI/X (Leader-Member-Interaction/Exchange) affect the compliance levels of workers (Boje et al., 2012). In addition, Cornelissen (2014) points out that in organisations with an open corporate structure, employees actively engage with each other regardless of their tier in the company. On the other hand, organisations having other forms of corporate structures, for instance, rigid top-down hierarchies, have to uniquely model their communication frameworks to achieve active and fast employee information exchange (Balaji and Murugaiyan, 2012, Larson and Gray, 2011).

As suggested by the interviewees, the company has a top-down structure and in fact, with the current use of DevOPS and agile frameworks, negative hierarchical problems have cropped up. Accordingly, cross-department communication, for instance between the operations and design units, was hampered until the introduction of a DevOPS team. Moreover, enhanced communication through frequent meetings and team

integration are repeatedly noted as having led to the huge success of project x. Furthermore, given the drastic changes that the ETS company is undergoing at the moment, there is a need to encourage open communication, which will allow all involved stakeholders to contribute to modelling a robust project delivery framework. Otherwise, as noted in Section 2.2, should a top-down structure be encouraged, employees at low tiers may not feel a part of the proposed changes and therefore, are unlikely to be fully committed to organisational endeavours aiming to improve the company's project delivery processes.

In addition, delays resulting from the current delivery methodologies in the company (TI & EUTDSM) and improperly integrated teams are also a concern, which, if addressed, could support rapid delivery. Wysocki (2011) points out that project delays are not a cause in and of themselves; rather, they are a result of weak project delivery structures. Regardless, as pointed out in Section 2.2, delays lead to unmet project goals and in some cases could lead to huge penalties, most especially for the contracted company. Therefore, the ETS company has monetary reasons to be concerned about the factors leading to delays in project delivery. As noted by the interviewees, it would be beneficial to move from a waterfall-agile approach to a pure agile framework. In Section 2.3, of the disadvantages sequentially conducted processes were discussed and the waterfall approach is noted to have caused significant production complexities in British Telecom (Cooke, 2014).

In addition, operating under one methodology will ensure that the company's systems are streamlined to a single system and that delays caused by a mixture of badly amalgamated methodologies would be eliminated. On the other hand, while it is acknowledged that the use of a variant system in project delivery provides organisations with alternatives in the case of failure (Pryke and Smyth, 2012). In this case, the two approaches are the waterfall and the agile. While the latter focuses on rapid delivery and parallel processes, the former works within rigid frameworks and involves sequential production, which is associated with slower delivery. Therefore, to support rapid production, the organisation must shift its processes to a pure agile framework.

4.3.3 Development teams will require a Dev OPS team going forward

DevOPS, its role in the implementation process of projects and permanent adoption, together with expected changes, was also extensively explored. An aspect that is immediately obvious from the discussions is that unlike agile delivery and its related frameworks, DevOPS is a well-known concept among the senior workers of the ETS company. All the interviewees correctly noted what DevOPS consists of and how it is conducted. Wysocki (2011) points out that chief among the things that ensure the success of newly introduced concepts in an organisation is employee understanding. As highlighted in Section 2.6, when the personnel have proper knowledge about change, their compliance is likely to be high, which is crucial to effective implementation of a proposed corporate change (Benn et al., 2014, Smith, 2011). Accordingly, an enhanced understanding of DevOPS shows that the ETS company's move to use DevOPS teams is well-timed and, if properly employed, will ensure that favourable outcomes are obtained.

In addition, as presented in many of the themes, a factor that considerably aided the realisation of project x's goals is the collaboration of teams. As noted by the interviewees, the delivery of company products was slowed considerably by the exclusion of the operations team from the product design stage. This exclusion meant that the operation team would have to take time understanding the designed prototype before embarking on consequent product development processes. However, the collaboration between these teams at the design stage significantly shortened the delivery period of products because minimal time was necessary to be spent in deciphering the developed prototypes. As pointed out in Section 2.4.3, team collaboration is a real value-added feature of DevOPS (Debois, 2011, Httermann, 2012, Schaefer et al., 2013). Furthermore, from the collected data, the other teams that were integrated to help achieve project goals were the lines of business and ETI/ETS teams. Accordingly, this indicates the company's need for DevOPS teams.

From the collected data, it is also noted that DevOPS was employed to enhance decision-making. Meredith and Mantel Jr (2011) note that most organisations fail because they lack proper decision-making mechanisms. In fact, a study by Citroen (2011) noted that, when making decisions, most modern organisations undermine the collective experience of senior workers, and overly depend on given individuals, technology and market predictions. In the case of the ETS company, the use of

DevOPS, where teams are integrated, and mechanisms such as frequent scrum meetings are employed to reach decisions, was noted as the main driver of project x's success. The process involved bringing together various teams to a single platform, on which their ideas could be shared and implemented with little or no difficulty. Accordingly, as suggested by all the interviewees and related literature in Section 2.4.3, DevOPS plays an integral role in enabling a working environment characterised by high collaboration and solid feedback systems, which are crucial to sound and expedient decision-making (Meredith and Mantel Jr, 2011).

Besides, as pointed out in the collected data, DevOPS played a key role in realising an agile environment when undertaking project x. Furthermore, enhanced collaboration among project units is noted as a major change that was made when undertaking project x. Wysocki (2011) points out that pulling teams into a single platform to share resources and exchange ideas considerably shortens the time spent in design and production. The views of Wysocki (2011) are made evident by the data on the ETS company, whereby, through the inclusion of the operations unit in the design stage, time spent in post-design stages was significantly minimised and, in turn, this enabled rapid delivery.

The two aspects are intimately correlated such that DevOPS leads to rapid delivery while for RDU, team integration and collaboration, which are DevOPS aspects, are necessary. However, this does not imply that DevOPS must be deployed together with RDUs. As suggested by the interviewees, using either approach to project delivery leads to significant organisational restructuring and policy changes, which could be costly and cause considerable project delays. Furthermore, for effectiveness, substantial resources must be allocated to endeavours geared towards obtaining high employee compliance.

In fact, as noted by the interviewees, employee training will be important to ensuring that the use of both approaches improves project delivery processes in the ETS company. Therefore, given the large number of interviewees who felt the need for a permanent DevOPS (seven) and the potential benefits these teams have to start with, the company could opt to integrate a permanent DevOPS team and have the full enthusiasm and backing of the related teams.

In addition, with regards to the participant's views on the permanent establishment of a DevOPS team, numerous views that inform the study's main objectives can be derived.

Over half of the total participants felt that numerous aspects must first be addressed before the introduction of a permanent DevOPS team in the company. A major issue for concern is prioritisation, where, in the current structure, members must balance their individual on-going corporate responsibilities with added participation in the DevOPS team.

Accordingly, if DevOPS is permanently adopted, conflict and confusion, which in turn could adversely affect the overall organisational performance, are likely to result. Furthermore, as noted by the interviewees, other concerns that must be addressed when adopting a permanent DevOPS include the skill-sets, dynamism of members and how the unit should work alongside the RDU team. A clear outline of how the two teams will function will help to address the hierarchical problems that currently exist in the company.

However, regardless of the challenges faced by the introduction of DevOPS in the company, all interviewees noted that the approach had considerably enhanced the project delivery process. While its permanent adoption in the company would first need a restructured corporate system, which may slow down delivery in the short term, DevOPS will significantly benefit the company in the long term. In particular, DevOPS will integrate all teams involved in the production process and thus enable resource sharing (lesser operational costs), enhanced knowledge exchange, collaboration and strong feedback systems, and uninterrupted product development, all of which point to rapid delivery. Therefore, the company needs DevOPS teams to deliver products rapidly to meet business demands.

4.3.4 Summary

From this chapter, three major aspects are realised. These factors are listed below.

1. The current methodology in the ETS company (TI/EUTDSM) does not support rapid delivery. Accordingly, there is a need for extensive integration of agile frameworks.

2. The organisation must address numerous concerns that could potentially hamper the realisation of an environment that supports rapid production. Inactive HR involvement, poor communication structures, a rigid culture, role prioritisation, cost-effective project implementation methodologies and weak knowledge management frameworks are some of the factors that the ETS company must address.

3. The company should introduce a permanent DevOPS team, after addressing issues resulting from an unsupportive corporate structure and culture.

5 Chapter 5: Conclusions and Future Work

5.1 Introduction

The main objective of this research was:

- To determine the impact an IT organisation's methodology has on rapid project delivery

Accordingly, the case study carried out to research whether current company methodologies and team structures supported the rapid delivery framework. As pointed out in Section 2.2, an agile environment is characterised by quick decision-making structures, high collaboration, considerably scaled down project implementation processes, among many other features (Oakland, 2014, Purna Sudhakar, 2012).

The research pointed out four aspects that would show how this research question was answered.

1. To study the various organisational factors involved selecting a project delivery model in the ETS company.
2. To study the impact of forming a new Dev OPS or Rapid Delivery Unit in ETS.
3. To integrate identified aspects of agile project delivery methodologies and recommend a new methodology for the ETS company.
4. To study the impact of organisation structure change on people in ETS

This research was carried out on an ICT shared services company (ETS) in Ireland. As part of the study, eight semi-structured interviews were undertaken. This chapter summarises the final research findings and places them within the context of the organisation in which the research was carried out. The research examines both the implications and opportunities that the organisation may have. It also discusses the limitations of this study, as well as providing recommendations for further research in the area being researched.

5.2 Interview Findings

The research established that the company used a EUTDSM methodology to undertake its projects. These methodologies are known for having numerous sequential stages that are linked to highly conservative environments or for the undertaking of considerably sensitive projects. Accordingly, the large number of processes when using these methodologies to undertake projects hampers rapid delivery. In addition, the study also noted that rapid delivery was further undermined by the company's culture, which did not have any particular HR model to support team integration. In addition, the company emphasises the need for employees to specialise in their specific areas of work, as opposed to learning related skills and this hampered the development of effective RDU and DevOPS teams. Overall, the research determined that the organisation's existing methodologies and team structures cannot allow for rapid delivery, and should agile frameworks be supported in the company, the methodological and structural changes that were made when undertaking the project x must be sustained or even improved. The changes include the introduction of RDUs, DevOPS team, scrum meeting and the establishment of tight deadlines and improved collaboration.

The other research objectives were:

- To study various organisational factors involved in the delivery model in the ETS company

Numerous organisational factors were pointed out as being crucial to the delivery model of the company. Chief among these factors was the organisational culture, which was noted as having a substantial influence on the motivation of employees. In addition, the corporate culture, particularly as enacted by the HR division, was also noted as having a significant influence on the compliance of employees to change. Added to these factors, open communication that is supported by an appropriate organisational culture was also identified as being crucial to the rapid delivery model suggested for the company.

- To study the impact of forming a new Dev OPS or Rapid Delivery Unit in ETS

DevOPS and rapid delivery, and what they constitute as applied to the organisation, were also widely studied. The participants provided their opinions on how these aspects have been implemented in the company, and specifically, in the implementation of a recently concluded successful project. From the research, it was noted that the formation process of DevOPS requires employees who have a wide range of skill sets. Furthermore, when DevOPS and RDUs are established at the same time, hierarchical problems may naturally occur, and the corporate structure should be modelled to negate these difficulties. Issues regarding job prioritisation, in which employee attention is split between undertaking their main organisational roles and participating in these new teams, must be addressed through proper policies and corporate structuring. Nonetheless, despite these challenges, RDUs and DevOPS teams lead to enhanced collaboration, timely delivery, cost-effectiveness and resource sharing.

- To integrate identified aspects of agile project delivery methodologies and recommend a new methodology for the ETS company

By studying the company, its culture, the role of the HR, communication frameworks, team integration and knowledge management structures, the research modelled these factors to uniquely fit the project delivery needs of the ETS company. Chief among the changes suggested in the model is the introduction of the agile methodology to replace the company current EUTSDM methodology and thus eliminate delivery delays. In addition, the research also suggested a pure agile framework, as opposed to a mixture of the agile and waterfall approaches. The need to have clearly-defined HR models that support a productive culture and team integration is also well-noted. Accordingly, the company's HR department needs to be more actively involved in the company's developmental agenda. Furthermore, another aspect that was suggested from the study is the need to have a DevOPS team to allow for continued collaboration and rapid project delivery

- To study the impact of organisation structure change on people

The structural changes noted for the delivery of project x was the formation of the DevOPS team. Delivery of project x highlighted the need for a permanent team. The RDU was noted as having wide raging effects on people and most specifically, in the context of the working environment. RDUs are characterised by frequent meetings and tight deadlines. Accordingly, these activities were noted as making individuals appreciate teamwork and collaboration, and therefore, indirectly influencing the corporate culture. Furthermore, RDUs also had significant effects on improved performance, a fact that was made evident by the recent successfully conducted project. However, the organisational culture of the company significantly undermined the potency of RDUs in influencing individuals. Accordingly, for RDUs to have a stronger impact on people, there is a need to model the culture of the company such that it promotes knowledge sharing, open communication and collaboration.

5.3 Recommendations

The following recommendations are based on the literature and findings derived from previous chapters.

- Develop a new TI methodology for project delivery

There is a need for effective and rapid delivery of infrastructure for individual business units. Interview findings show that over half of the participants agree that the existing TI methodology is not suitable for rapid infrastructure delivery. The ETS organisation needs to adopt agile methodologies in delivering infrastructure and according to Cobb (2012) this form of methodology emphasises quick delivery.

- Develop Communication Strategy

To introduce agile methodologies research has shown that communication needs to improve between operations, development teams and the customers. Research has indicated that communication is the main quality of agile methodologies (Eckstein, 2013) and half of the participants indicated that strong collaboration was one of the main drivers of success for the delivery of project x. A strong communication strategy requires an open innovation-friendly organisational culture to actively engage employees (Balaji and Murugaiyan, 2012).

- Introduce Dedicated Project Risk Team

The introduction of agile methodologies introduces some risk to the organisation. Considerable risk is associated with quick deliveries (Cobb, 2012) and three of the participants raised concerns that by seeking to expedient results, there is a risk in not adhering to the standards and controls that have been implemented as a reflection of the company's project risk experience to date. Even though, Eckstein (2013) notes that risks are considerably reduced by the enhanced communication created in agile structures. The introduction of a project risk team could be considered a necessary oversight for rapid delivery projects. This would ensure adherence to standards and combined with the enhanced communication that Eckstein (2013) posits would considerably reduce any risk to the organisation.

- Introduce a Permanent DevOPS Team

Given the large number of interviewees who felt the need for a permanent DevOPS (seven) and the potential benefits these teams have to start with, the ETS company should create a permanent DevOPS team. All interviewees noted that the approach had considerably enhanced the project delivery process. In particular DevOPS integrates all teams involved in the production process which enables sharing of resources, enhanced knowledge exchange, collaborations and strong feedback systems

all of which should lead to rapid delivery. Wysocki (2011) points out that pulling teams into a single platform to share resources and exchange ideas considerably shortens the time spent in design and production. The views of Wysocki (2011) are made evident by the data on the ETS company, whereby, through the inclusion of the operations unit in the design stage, time spent in post-design stages was significantly minimised and, therefore, this enabled rapid delivery.

- Change ETS Structure

The organisation must address numerous concerns that could potentially hamper the realisation of an environment that supports rapid production. Over half of the interviewees felt that major issue for concern in the current structure is prioritisation, where, in the current structure, members have to work on their individual corporate responsibilities and still participate in the DevOPS team roles as well. By changing the ETS structure from a silo skillset approach to a single platform team, this will promote knowledge sharing and reduce the risk or concerns to production environments.

- Change Organisation Structure

As suggested by the interviewees in section 4.3.3, the company has a top-down structure and in fact, with the current use of DevOPS and agile frameworks, hierarchical problems have cropped up. Therefore, changing the top-down structure to an open structure will actively engage employees with each other regardless of their tier in the company (Cornelissen, 2014).

- Develop HR Models to Support Management and Staff

Introduce HR models that support a productive culture and team integration. From the interviews, none of the interviewees are aware of any clearly-defined HR model employed to integrate teams and realise a favourable culture for ETS. HR support for

management and staff is central to establishing a culture that enables high employee and organisational productivity (Griffin and Moorhead, 2011). Accordingly, there is a need to involve the HR department actively in shaping a culture that supports team integration.

- Develop Knowledge Management Frameworks

The promotion and benefits of knowledge sharing should be encouraged. During the course of the research, interviewees noted that training is important in order to ensuring that the use of DevOPS would be a continued success. The framework may allow for the introduction of an Information system solution for sharing purposes.

5.4 Generalisability of Findings

According to Saunders et al. (2007), generalisability or external validity refers to the extent to which the findings of a research study are applicable or can be compared to other sources. As detailed in section 3.6, the research approach chosen was a case study approach using semi-structured interviews to gather data. According to Davies and Hughes (2014), qualitative research is useful for an in-depth study and additionally Silverman (2013) observes that qualitative descriptions are rich in details. This also relates to previous research that interviews are the preferred method for collecting data from participant's when exploring an insightful topic (Rowley, 2012). The organisation chosen was a ICT shared services company that is developing a DevOPS program to support the needs and desires of business units and their customers. The market in which the organisation operates is undergoing rapid and fundamental change. Therefore the interpretivist approach was considered the most suitable as the purpose of the dissertation was to understand a particular phenomenon rather than generalise (Yanow and Schwartz-Shea, 2015).

The use of Agile methodologies or DevOPS is not confined to a particular size of organisation. A number of overarching themes emerged in section 4.3 correlate closely with those being discussed by large IT advisories such as Gartner. Certain

organisational traits around improving communication were identified that were also experienced in BT as detailed in section 2.3. The agile considerations and findings that emerged are generalizable to any IT organisation with a significant demand for rapid delivery or digital services to their customers.

5.5 Research Limitations

While the research of agile methodologies is a topic researched in some detail, there were relatively few peer-reviewed papers that specifically deal with the infrastructure delivery within an organisation, the integration of teams to achieve agile or rapid delivery and the impact that organisational culture can have on the successful delivery of a project.

A major limitation of the research is its use of a single data collection method, which uses the views of eight participants only. Accordingly, while much is revealed about the corporate culture and the impact on individuals, the sample is limited and its objectivity may always vary depending on the position of the worker within the company's hierarchy. Further, rich information could be obtained from certain workers in order to help justify the study's position. Therefore, in future related research, large numbers of employees from lower organisational tiers can be engaged through a wide range of data collection techniques, for instance, questionnaires, to obtain information that would help to validate the findings of this research. The use of quantitative methods, as opposed to qualitative techniques, will enable data triangulation and will diversify the research on this topic. In addition, another aspect that proved challenging to this research is data analysis; as a result of adopting a semi-structured approach to the collection method which made collected information incongruent and hard to integrate and code

5.6 Opportunities for Future Research

A major area that has been studied during this research is the role of the corporate culture in rapid delivery environments. In addition, the study also establishes the

difficulties associated with the deployment of simultaneous DevOPS and agile framework deployment. The two advancements will help inform other organisations on what to expect and how they can remodel their organisational structures to deal with situations that could arise in a rapid delivery environment.

When exploring the issue of corporate culture and its role in rapid delivery, this study adopts a general view and participant responses from scenarios common to most organisations. Accordingly, the conclusions on culture can be generalised to other cases outside of the company's environment. However, some aspects, for instance, knowledge management structures, employee skills and the role in DevOPS team formation are unique to the organisation and cannot be generalised.

Regardless, the use of key words proved effective, as major themes became more evident on employing the analysis software. Overall, this research has numerous avenues that future studies could focus on. Given that this study took a general approach, future research can focus on corporate culture factors (communication, knowledge management, organisational change, organisational structures and others) in isolation and study their influence on DevOPS and agile frameworks.

5.7 Contribution to the Field of Research

In addition to proving that the current existing methodologies (Section 4.3.1) and team structure (Section 4.3.2) are not suitable for rapid delivery, the research contributes to existing literature by answering the research objectives (Sections 5.1 and 5.2) and presents emerging themes which are of interest to the field of research (Section 5.6).

5.8 Conclusion

From this research, a primary aspect that is apparent is that the ETS company's current methodology cannot support rapid delivery and therefore, to ensure success in future projects, the methodological changes that have been made must be sustained or improved over time.

The research presents an interesting finding that the role of corporate culture plays in agile environments. The research establishes that while considerable effort and resources may be spent in developing highly agile delivery environments and DevOPS teams, with a culture that does not support the values in either aspect, the rewards of these endeavours will be significantly limited. For high productivity and optimal performance, the researched literature has indicated that changes to improve organisational performance are necessary (Robbins and Judge, 2013). The findings also support prior claims in literature by Robbins and Judge (2013) that to ensure that excellent input is continually obtained, HR rewards systems and appraisal structures must be in place. Accordingly, the process of changing company culture is difficult because it challenges the beliefs and values of employees.

Therefore, companies will find adopting agile methods, for example the creation of a DevOPS team a challenge. While its permanent adoption in the company may slow down delivery in the short term, agile methods like DevOPS will significantly benefit the company in the long term.

In addition, based on these findings and existing literature, the study establishes that deploying DevOPS and RDUs presents more difficulties than benefits and contrary to the conventional approach, it would be more suitable for the ETS company to start with a single aspect and to develop its frameworks such that the introduction of the other cannot interfere with the other's operations. Adopting aspects of agile methodological components would address the company's needs and enhance project delivery. Organisational constraints in the form of culture and opinion need to be addressed to fully realise the benefits of Agile Methodology adoption. Adopting individual agile methodological components

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Appendices

Appendix 1 – Ethics Application and Supporting Documentation

School of Computer Science and Statistics
Research Ethical Application Form

Part A

Project Title: A Study of the Impact of Agile Infrastructure Delivery on an Irish SME and its People

Name of Lead Researcher (student in case of project work): **Gordon Fallon**

Name of Supervisor: **Paula Roberts**

TCD E-mail: fallongo@tcd.ie Contact Tel No.: 0879852362

Course Name and Code (if applicable): Masters in Management of Information Systems

Estimated start date of survey/research: 20/06/2016

I confirm that I will (where relevant):

- Familiarize myself with the Data Protection Act and the College Good Research Practice guidelines http://www.tcd.ie/info_compliance/dp/legislation.php;
- Tell participants that any recordings, e.g. audio/video/photographs, will not be identifiable unless prior written permission has been given. I will obtain permission for specific reuse (in papers, talks, etc.)
- Provide participants with an information sheet (or web-page for web-based experiments) that describes the main procedures (a copy of the information sheet must be included with this application)
- Obtain informed consent for participation (a copy of the informed consent form must be included with this application)
- Should the research be observational, ask participants for their consent to be observed
- Tell participants that their participation is voluntary
- Tell participants that they may withdraw at any time and for any reason without penalty
- Give participants the option of omitting questions they do not wish to answer if a questionnaire is used
- Tell participants that their data will be treated with full confidentiality and that, if published, it will not be identified as theirs
- On request, debrief participants at the end of their participation (i.e. give them a brief explanation of the study)
- Verify that participants are 18 years or older and competent to supply consent.
- If the study involves participants viewing video displays then I will verify that they understand that if they or anyone in their family has a history of epilepsy then the participant is proceeding at their own risk
- Declare any potential conflict of interest to participants.
- Inform participants that in the extremely unlikely event that illicit activity is reported to me during the study I will be obliged to report it to appropriate authorities.
- Act in accordance with the information provided (i.e. if I tell participants I will not do something, then I will not do it).

Signed: Gordon Fallon Date: 11/6/16
Lead Researcher/student in case of project work

Part B

Please answer the following questions.		*Yes/No*
Has this research application or any application of a similar nature connected to this research project been refused ethical approval by another review committee of the College (or at the institutions of any collaborators)?		No
Will your project involve photographing participants or electronic audio or video recordings?		Yes
Will your project deliberately involve misleading participants in any way?		No
Does this study contain commercially sensitive material?		No
Is there a risk of participants experiencing either physical or psychological distress or discomfort? If yes, give details on a separate sheet and state what you will tell them to do if they should experience any such problems (e.g. who they can contact for help).		No
Does your study involve any of the following?	Children (under 18 years of age)	No
	People with intellectual or communication difficulties	no

SCSS Research Ethics Application Form August 2014

	Patients	No

School of Computer Science and Statistics
Research Ethical Application Form

Details of the Research Project Proposal must be submitted as a separate document to include the following information:

1. Title of project
2. Purpose of project including academic rationale
3. Brief description of methods and measurements to be used
4. Participants - recruitment methods, number, age, gender, exclusion/inclusion criteria, including statistical justification for numbers of participants
5. Debriefing arrangements
6. A clear concise statement of the ethical considerations raised by the project and how you intend to deal with them
7. Cite any relevant legislation relevant to the project with the method of compliance e.g. Data Protection Act etc.

Part C

I confirm that the materials I have submitted provided a complete and accurate account of the research I propose to conduct in this context, including my assessment of the ethical ramifications.

Signed: ..... Date: 11/6/16
Lead Researcher/student in case of project work

There is an obligation on the lead researcher to bring to the attention of the SCSS Research Ethics Committee any issues with ethical implications not clearly covered above.

Part D

If external or other TCD Ethics Committee approval has been received, please complete below.

External/TCD ethical approval has been received and no further ethical approval is required from the School's Research Ethical Committee. I have attached a copy of the external ethical approval for the School's Research Unit.

Signed: ..... Date: 11/6/16
Lead Researcher/student in case of project work

Part E

If the research is proposed by an undergraduate or postgraduate student, please have the below section completed.

I confirm, as an academic supervisor of this proposed research that the documents at hand are complete (i.e. each item on the submission checklist is accounted for) and are in a form that is suitable for review by the SCSS Research Ethics Committ

Signed: ..... Date: 9/6/16
Supervisor

Completed application forms together with supporting documentation should be submitted electronically to research-ethics@scss.tcd.ie Please use TCD e-mail addresses only. When your application has been reviewed and approved by the Ethics committee hardcopies with original signatures should be submitted to the School of Computer Science & Statistics, Room F37, O'Reilly Institute, Trinity College, Dublin 2.

Appendix 2 - Information Sheet for Participants

Background to the Research:

A more agile IT infrastructure promises to drive new business value, reduce costs and deliver sustainable growth into the future for an enterprise. Yet, to achieve such a transformation, IT organizations must be prepared to review their existing project delivery methodologies, review their IT team structure and understand the potential impact on their employee's.

Currently, Irish Life's new IT organization called European Technology Services (ETS) runs on a traditional model, which many of their customers have noted as slow and costly. In the last 6 months ETS worked with one of its customers to deliver a project using a different methodology than previously used. Accordingly, a new project delivery model that addresses all the raised concerns will prove highly advantageous for Irish Life. This research proposes to study the impact of changing the company's IT project delivery methodologies. To achieve this, the research paper proposes to analyse the existing project delivery methodology model and develop a new project delivery methodology for the company.

Furthermore, for strong relevance to the organization's current structure, this research proposes to study the impact of changing the company's IT structure with the introduction of a new DevOps team. Organizations with considerable support for employees are more likely to yield high compliance levels than those with unsupportive environments.

The existing DevOps team requires employee's to perform dual roles and responsibilities. The aim of this research also aims to provide an overview of employee's perceptions and concerns with the new DevOps team

Why you were selected for participation:

You have been chosen to participate in this study because of your particular knowledge of ICT within Irish Life

Interviews will be electronically recorded on an encrypted laptop. The recordings will be destroyed on the 31st of October 2016.

Procedures of this study:

Please note that the following procedures apply to the interview process. You are asked to read these carefully:

- You must be 18 years of age or older to participate in the interview
- It is anticipated that the interview will be between 30 and 40 minutes in duration
- The interview can be conducted either in person or via phone
- Participation is voluntary and you are free to withdraw from the interview at any time without penalty
- You are not obligated to answer any questions
- Confidentiality and anonymity will apply to your participation in the interview process and to all subsequent publication and presentation material
- In the unlikely event that illicit activities are disclosed during the course of the interview these will be reported to the appropriate authorities
- You will be asked to permit audio recording of the interview. This is to support the accuracy of the subsequent transcription and analysis. All recordings will be stored in accordance with Data Protection Regulations, and all recordings will be destroyed once the research has concluded. You are entitled to stop the recording at any time without penalty and you may, at any time, even subsequent to your participation, have such recording destroyed.
- Should you not wish to have the interview audio recorded then the interview will be manually transcribed. These transcriptions can be reviewed by you and signed once the interview has concluded.
- The interviewer will seek the written permission of the interviewee prior to the use of any quotation to ensure that context has been preserved
- Your participation is fully anonymous and no personal details about you will be recorded.
- For the purposes of anonymity the interviews will be transcribed removing any reference to the Organisation names.
- No risks to you have been identified as a result of your participation in the interview. However, you have the right to withdraw from the interview at any time if you believe that unacceptable risks exist

Conflict of interest:

The material collected for this study will be used exclusively for academic purposes and in support of the M.Sc. in Management of Information Systems. I have no conflict of interest in relation to the topic under investigation or in relation to any individual or organisation contributing to the study

Publication:

The information gathered from interviews will form the basis of for the analysis and findings sections in the completed study

The study will subsequently be stored on Trinity College Dublin's database and can be accessed through normal publication procedures.

A completed copy of the dissertation can be made available to you upon request. Should you wish to clarify any aspect of the interview process feel free to contact me.

Lead Researcher Contact Details*:*

Gordon Fallon

Email: fallongo@tcd.ie

Many thanks in advance for taking the time to participate in this study. Your participation is both greatly valued and appreciated.

Appendix 3 - Participant Consent Form

Research Title:

A Study of the Impact of Agile Infrastructure Delivery on Irish Life and its People

Lead Researcher:

Gordon Fallon - Trinity College Dublin, School of Computer Science and Statistics

Background to the Research:

A more agile IT infrastructure promises to drive new business value, reduce costs and deliver sustainable growth into the future for an enterprise. Yet, to achieve such a transformation, IT organizations must be prepared to review their existing project delivery methodologies, review their IT team structure and understand the potential impact on their employee's.

Currently, XXXXX new IT organization called European Technology Services (ETS) runs on a traditional model, which many of their customers have noted as slow and costly. In the last 6 months ETS worked with one of its customers to deliver a project using a different methodology than previously used. Accordingly, a new project delivery model that addresses all the raised concerns will prove highly advantageous for Irish Life. This research proposes to study the impact of changing the company's IT project delivery methodologies. To achieve this, the research paper proposes to analyse the existing project delivery methodology model and develop a new project delivery methodology for the company.

Furthermore, for strong relevance to the organization's current structure, this research proposes to study the impact of changing the company's IT structure with the introduction of a new DevOps team. Organizations with considerable support for employees are more likely to yield high compliance levels than those with unsupportive environments.

The existing DevOps team requires employee's to perform dual roles and responsibilities. The aim of this research also aims to provide an overview of employee's perceptions and concerns with the new DevOps team

Why you were selected for participation:

You have been chosen to participate in this study because of your particular knowledge of ICT within Irish Life.

Procedures of this study:

Each and every question in the interview is entirely optional. The interview is anticipated to take approximately 30 to 40 minutes. The information collected during the process will be analysed subsequently. To aid this analysis and the associated transcription, the interview audio will be recorded and stored on an encrypted laptop. If this is likely to cause issues for you, the interview will be manually transcribed, though this is likely to extend the duration of the interview process. No risks to you have been identified as a result of participating in the interview process. The recordings will be destroyed on the 31st of October 2016.

Publication:

Results of the interviews supporting the study will be aggregated and reported on an aggregate basis. All results data will be completely anonymous with the identity of the participants never being revealed in any way. All results will be used as part of the dissertation in partial fulfilment of the requirements for the degree of M.Sc. in Management of Information Systems (MIS) being undertaken at Trinity College Dublin. Trinity College Dublin will retain the dissertation upon completion.

Declaration:

- I am 18 years of age or older and am competent to provide consent
- I have read, or had read to me, a document providing information about his research and this consent form. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction and understand the description of the research that is being provided to me.
- I agree that my data will be used for scientific purposes and I have no objection that my data may be published in scientific publications in a way that does not reveal my identity.
- I understand that if I make illicit activities known, these will be reported appropriate authorities.
- I understand that I may stop electronic recordings at any time, and that I may at any time, even subsequent to my participation have such recordings destroyed (except in situations such as above) without penalty.
- I understand that, subjects to the constraints above, no recordings will be replayed in any public forum or made available to any audience other than the current researchers/research team.
- I freely and voluntarily agree to be part of this research study, though without prejudice to my legal and ethical rights.
- I understand that I may refuse to answer any questions and that I may withdraw at any time without penalty
- I understand that my participation is fully anonymous and that no personal details about me will be recorded.
- I have received a copy of this agreement.

PARTICIPANTS NAME: _____

PARTICIPANT'S

SIGNATURE: _____

Date:_____/_____/_____

Statement of Lead Researcher's Responsibility:

I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent.

Lead Researcher Contact Details*:*

Gordon Fallon

Phone: +353 (0) 879852362

Email: fallongo@tcd.ie

Appendix 4 - Organisation Consent Form

Research Title:

A Study of the Impact of Agile Infrastructure Delivery on Irish Life and its People

Lead Researcher:

Gordon Fallon - Trinity College Dublin, School of Computer Science and Statistics

Supervisors:

Paula Roberts - Trinity College Dublin, School of Computer Science and Statistics

Lead Researcher Contact Details*:*

Name: Gordon Fallon

Email: fallongo@tcd.ie

Expected Duration:

The expected duration of this research is from May to August 2016.

This study is conducted in partial fulfilment of Gordon Fallon's MSc, to be awarded by the School of Computer Science and Statistics, Trinity College Dublin, Ireland.

Background to the Research:

A more agile IT infrastructure promises to drive new business value, reduce costs and deliver sustainable growth into the future for an enterprise. Yet, to achieve such a transformation, IT organizations must be prepared to review their existing project delivery methodologies, review their IT team structure and understand the potential impact on their employee's.

Currently, xxxxxx new IT organization called European Technology Services (ETS) runs on a traditional model, which many of their customers have noted as slow and costly. In the last 6 months ETS worked with one of its customers to deliver a project using a different methodology than previously used. Accordingly, a new project delivery model that addresses all the raised concerns will prove highly advantageous for Irish Life. This research proposes to study the impact of changing the company's IT project delivery methodologies. To achieve this, the research paper proposes to analyse the existing project delivery methodology model and develop a new project delivery methodology for the company.

Furthermore, for strong relevance to the organization's current structure, this research proposes to study the impact of changing the company's IT structure with the introduction of a new DevOps team. Organizations with considerable support for employees are more likely to yield high compliance levels than those with unsupportive environments.

The existing DevOps team requires employee's to perform dual roles and responsibilities. The aim of this research also aims to provide an overview of employee's perceptions and concerns with the new DevOps team

Permission to conduct this Research:

Interviews will be electronically recorded on and encrypted laptop and destroyed on the 31st of October 2016. Participants will be informed of this prior to the commencement of the interview and will be given the opportunity to withdraw from the interview process if they would prefer not to be recorded. Participants will also have an opportunity to review all recordings after the completion of the interview process and make any changes and/or corrections they deem necessary. All interview recordings will be encrypted and only the lead researcher and the research supervisor will have access to these recordings. Any recording made will not be replayed in any public forum or presentation of the research. At no time will any electronic recording be identifiable unless you give prior written permission.

Publications from this Research:

Results, data and findings from this research will be published as Gordon Fallon's final MSc thesis. Additionally, results, data and findings from this research may be published in one or more peer-reviewed journals, conference proceedings, and a variety of other research publications and conferences. The results of this research will also be disseminated through a number of national and international networks. Primarily, Trinity College Dublin will be responsible for sharing research findings through their government and academic partnerships both in Ireland and abroad.

Research outcomes will be shared directly with Trinity College. The findings from this study may be used to making improvements in project delivery and organisation culture

By approving this research, you agree that this data may be used for such scientific purposes, and that you have no objection that the data is published in research and scientific publications in a way that does not reveal your specific identity.

If published, data will not be identifiable as that of any individual or organisation. Individual results will be aggregated anonymously and research reported on aggregate results

Declaration:

- I have read, or had read to me, a document providing information about this research and this consent form. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction and understand the description of the research that is being provided to me.
- I agree that the data collected is used for scientific purposes and I have no objection that the data is published in scientific publications in a way that does not reveal the identity of the organisation.
- I understand that if illicit activities are made known, these will be reported to appropriate authorities.
- I understand that the participant may stop electronic recordings at any time, and that I may at any time, even after participation, have such recordings destroyed (except in situations such as above).
- I understand that, subject to the constraints above, no recordings will be replayed in any public forum or made available to any audience other than the current researchers/research team.
- I freely and voluntarily allow data provided in this interview to be part of this research study, though without prejudice to my legal and ethical rights.
- I understand that the participant may refuse to answer any question and may withdraw at any time without penalty.
- I understand that the organisation's participation is fully anonymous.
- I have received a copy of this agreement.

IT MANAGERS NAME:

_____

MANAGERS SIGNATURE:

_____

Date: _____/_____/_____

Appendix 5 – Organisation Information Sheet

Background to the Research:

A more agile IT infrastructure promises to drive new business value, reduce costs and deliver sustainable growth into the future for an enterprise. Yet, to achieve such a transformation, IT organizations must be prepared to review their existing project delivery methodologies, review their IT team structure and understand the potential impact on their employee's.

Currently, Irish Life's new IT organization called European Technology Services (ETS) runs on a traditional model, which many of their customers have noted as slow and costly. In the last 6 months ETS worked with one of its customers to deliver a project using a different methodology than previously used. Accordingly, a new project delivery model that addresses all the raised concerns will prove highly advantageous for Irish Life. This research proposes to study the impact of changing the company's IT project delivery methodologies. To achieve this, the research paper proposes to analyse the existing project delivery methodology model and develop a new project delivery methodology for the company.

Furthermore, for strong relevance to the organization's current structure, this research proposes to study the impact of changing the company's IT structure with the introduction of a new DevOps team. Organizations with considerable support for employees are more likely to yield high compliance levels than those with unsupportive environments.

The existing DevOps team requires employee's to perform dual roles and responsibilities. The aim of this research also aims to provide an overview of employee's perceptions and concerns with the new DevOps team

PROCEDURES OF THIS STUDY:
In order to investigate the organisations project agility, the study aims to gather data from senior technical employees who have knowledge of these practices.

An interview of approximately thirty minutes to one hour in length will be conducted with participants. Audio recordings of the interview will be made so that they can later be reviewed by the researcher, but these recordings will not be made identifiable unless prior permission is sought by the researcher and granted by both the organisation and the participant.
All questions in this interview are optional. The participant is free to opt out of answering any question in the interview. The participant may end the interview at any time, for any reason, without penalty.

Illicit Activity:
In the unlikely event that illicit activity is reported, the researcher will be obliged to report it to appropriate authorities.

Debriefing:
A full explanation of the study is available on request after the interview has been completed. The researcher can be contacted using the details provided, should more information be required after the interview has concluded.

Permission

this document is to inform the organization that Interviews will be conducted with employee's who are currently permanent members of staff. All data in relation to names of employee's, application and any server details will be anonymized in the Interview transcriptions.

Declaration:

- I have read, or had read to me, a document providing information about this research and this consent form. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction and understand the description of the research that is being provided to me.
- I agree that the data collected is used for scientific purposes and I have no objection that the data is published in scientific publications in a way that does not reveal the identity of the organisation.
- I understand that if illicit activities are made known, these will be reported to appropriate authorities.
- I understand that the participant may stop electronic recordings at any time, and that I may at any time, even after participation, have such recordings destroyed (except in situations such as above).
- I understand that, subject to the constraints above, no recordings will be replayed in any public forum or made available to any audience other than the current researchers/research team.
- I freely and voluntarily allow data provided in this interview to be part of this research study, though without prejudice to my legal and ethical rights.
- I understand that the participant may refuse to answer any question and may withdraw at any time without penalty.
- I understand that the organisation's participation is fully anonymous.
- I have received a copy of this agreement.

Conflict of interest:

The material collected for this study will be used exclusively for academic purposes and in support of the M.Sc. in Management of Information Systems. I have no conflict of interest in relation to the topic under investigation or in relation to any individual contributing to the study

Publication:

The information gathered from interviews will form the basis of for the analysis and findings sections in the completed study.

The study will subsequently be stored on Trinity College Dublin's database and can be accessed through normal publication procedures.

A completed copy of the dissertation can be made available to you upon request. Should you wish to clarify any aspect of the interview process feel free to contact me.

Lead Researcher Contact Details*:*

Gordon Fallon

Email: fallongo@tcd.ie

Appendix 6 - Interview Questions:

A sample interview guide is shown below. Interviews will be semi-structured and will last for between 30 - 60 minutes.

Text in italics show interviewer notes/prompts.

General questions to all participants

1. Can you tell me about of one of ICT projects delivered in the last 12 months that have been perceived as a major success and what was your involvement if any?

    i) What did you observe as the main driver for success or failure of the project?

    ii) Were there moments when changes that lead to the success or failure were outside the existing delivery processes? If there were, please describe what was the driver to deviate from processes? What were those changes?

    iii) Were there any changes to methodologies or teams for the course of the project? If there were, please describe what was the driver to deviate from the existing methodology or structure?

2. Do you believe the existing methodology would allow for agile or rapid delivery?

3. As a result of the lessons learned from the project success or failures, are you aware of any changes in methodologies? If there were, please describe the changes if any and your opinion on any potential change? Are you aware of any changes to team structures?

4. As a result of the lessons learned from the project success or failures, are you aware of any changes in team structures?

5. What is your understanding of the term DevOps?

6. Would you have any concerns or advice for the introduction of a permanent DevOPS team in the organisation?

7. In your opinion how effective has the approach been in integrating the new DevOPS team in to the organisation?

8. Are you aware of any HR models used in the successful cultural integration of or teams within Irish Life?

    i) If you were to approach a potential organisational change required for agile delivery, what would you suggest is done, if anything at all?

    ii) Do you have any comment on how team members were managed and co-ordinated during the delivery of a project or the formation of a new team?

    iii) In your opinion, what is the impact of organisational culture on the successful delivery of a project?

Appendix 7 - Sample Interview

Interviewee 1 role. Responsible for the delivery of dev and test environments for multiple lines of business. Manager on the ETS or infrastructure side

Interviewer : Can you tell me about one of the ICT projects delivered in the last 12 months that was perceived as a major success?

Interviewee: sure yes i was involved in a project with our corp business side, one of the lines of business here and the project was to on board a new company to their the front facing web site so essentially we used an agile approach to delivering any of the infrastructure that they needed for that project. So, the timelines were very tight and in order to deliver we had to be agile so we did deliver on time, for the customer and the application got launched as per the original dates.

Interviewer: What was the main driver for success?

Interviewee 1. So, in the area that we work in we do follow a very waterfall approach to projects especially around delivering infrastructure and you know, delivering infrastructure for application teams to land their code on. Thats been historically how we have operated. We were seen as a major risk to the project being able to deliver because of that approach. So I suppose the heads of IS did meet about and said look what can we do, we see ETS as been a blocker to our project delivering on time. So thats the reason why we decided well ok, lets look at DevOPS and different ways of how we could basically do things quicker.
Essentially thats what we were looking to d. So, this was the first, trial of that and we used the agile approach working with the corp business team to deliver anything that they needed from an infrastructure perspective. So what we did actually was we embedded are project or our people in to their project so it became not a LOB v ETS project. It became 1 project top deliver the app and thats how we approached it it. Success is the fact that we were able to mitigate the risk that they had highlighted for our area and we all delivered the project on time so I think thats how we did it. In my view thats how we measured the success. If we hadn't it would of been seen that we highlighted that ETS as a department can't deliver quickly and I think we showed we could.

Interviewer: I think you've answered my other questions where, were there any changes to methodologies or team stream structures. Obviously you mentioned the Waterfall approach and the DevOPS team.

interviewee: Just another point on that, the way things normally work is when, let's say a software delivery type project comes from a LOB's. They come to us once they've done their design and their almost ready to deploy and sometimes it's too late because we're not involved in the design and we don't understand it and we ended up going over

that design work again so in this case the full amount of change we made was we were actually, our resources were embedded with their design team so all of that got ironed out very early on. That means that you're not hitting issues you know as you are trying to deploy in to your pre-prod or your production environment. So thats a key factor like, so that was a fundamental change in how we would normally operate.

Interviewer: So it's kind of maybe, getting involved in the architecture and builds

Interviewee: Absolutely

Interviewer: Architecture and builds happening at the same time?

Interviewee: The guys work together, you know for me it was about reducing the barriers of demarcation between teams, we are just one team and we are working on the team together to actually get this over the line so it avoids a lot of the arguments and questions that come later on because we actually don't understand what it is you are trying to do from an end to end perspective.

Interviewer, Ok, thanks Jeff. Next question, do you believe the existing methodology would allow for agile or rapid delivery?

Interviewee: So I suppose, it depends if you were to answer that. If we're doing a large infrastructure project, we have as you know a TI methodology and there's a lot of processes you have to go through and that makes sense when putting in brand new infrastructure when ripping out the network core, you need to have that because you need to make sure you're not going to break stuff and it's fit for purpose for the future. But, when we're doing work, especially on the application delivery side when we're working with the LOBs and we need to deliver infrastructure quickly, I don't think that methodology works because we can't be agile enough. Because we go through the same stages regardless of whether its, even it's a small medium or large TI project we kinda still go through the same methodology and I'm not sure that's what meets the business needs so I think a more agile approach to it, may not have to focus so much on the documentation and the methodology that's there. I know they have made changes to it but I still think we've a way to go to meet.

Interviewer: So we think we need to I suppose update the methodology further to become more agile.

Interviewee: I think we need an agile infrastructure methodology because essentially thats what we did for that project that we discussed.

Interviewer: And do you have any suggestions of what to change in the existing methodology?

Interviewee: Well I think you got to change the structure of the projects and thats the people. Really, you can't have a case where the infrastructure guys build the infrastructure and hand it over to the application guys. They have to be working together on it, do you know what I mean?

Interviewer: So I think that probably leads nicely on to the next question then. As a result of the lessons learned from the projects success or failures, are you aware of any changes in the team structures?

Interviewee: So, as a follow on from that, we haven't had a project like that since that went live earlier in the year but if we got a future project we would do the exactly same way. So what that means is you really are taking people out of the operations teams and you're embedding them in to the line of business project. So, we had a PM on the infrastructure side, there's a PM on the line of business side but our guys went to all of their daily stand ups, their scrum meetings,any of the design decisions or meetings around design they went to that. That was a change and I think if we had another project like that we would do the exact same thing. The other thing we've done is we've set up a rapid delivery unit so, as you prob know a lot of the stuff that comes from projects whether they are TI or there LOB we basically build them all the way to pre-prod and hand them over to OPS teams. So, there's a lot of project work that they have to do but it's not co-ordinated. So the idea of the rapid delivery unit is all the changes that need to come in to the operations teams from projects, we are using the Agile or the scrum methodology to manage and co-ordinate those changes. So we've put them all in to basically a canvan. The guys who are working on it are assigned that month. Thats not all they do but they are dedicated for 2-3 days per week and they just work on those project changes and the idea is that we are coordinating the changes amongst the team and reducing the hand offs between the teams which basically means we can get the work done quicker and provided for the projects. So that's something that we literally only changed in the last few months.

Interviewer: Ok so I think you've probably answered my next questions which was your understanding of the term DevOPS, so it's obviously as you described maybe...

Interviewee: Well I suppose DevOPS can mean if you go out and look at DevOPS or google it, you'll find that brings you loads of different forums and presentations about DevOPs and there's 100's of definitions. No one will give you a definition that matches, right?. There's a couple of areas that we're focusing on, for me, DEVOPS is what it says. It's getting the Dev and OPS teams working together. for that project we went through, that's exactly what happened. We were one team and we were able to prove that actually worked. On the other side there's things we could do around automation so in terms of, a lot of the lines of business use continuous integration tools so they want to be able to do nightly builds and they want to be able to do automated deployments in to their environments. We wanted to take that and do it in production and that for me is part of DevOPS as well. So if we can get that working and it builds

the confidence and it's not that you are getting stuff or pushing stuff in to production or quicker without the same due diligence. you're actually making it better because you can't put it in to teh environment and you can roll it back easily. Thats the thing about continuous integration. So to me, thats a key component of DevOPS as well. We're now embedding ourselves with the lines of business with the tooling they have to try and implement that.

Interviewer: Ok, would you have any concerns or advice for the introduction of a permanent DevOPs team for the organisation.

Interviewee: Yeah I suppose, where we are now is we're at the early stage and we're kind of struggling with should we have just a devops team or an RDU team and I suppose we've only really been piloting some of the stuff for the last 2 months. I think where we might get to is you know what this actually works and what we need to do is create that DevOPs/RDU team on a permanent basis. They just do the project work as opposed to, it means that they don't have to focus on the operations side all the time because that's what happens. People get dragged off for Priority 1 issues and then it all then just falls apart. I suppose it's hjow that works, I think at some point you do enough projects like that and you go this is working. I think you would need to separate out those people out in to a separate team.

Interviewer: In your opinion, how effective has the approach been in to integrating that DevOps team in to the organisation?

Interviewee: So far, it seems to be working. As I said, it's only kicked off in the last few months but what we are seeing is that we are getting through a lot of teh tasks quicker because we have the people in the room and the teams in the room that need to do the work. So again, it's down to reducing the hand off's between the teams. Also, they are now working with the lines of business projects. So, it's kind of more like 1 team delivering and they are getting through the work quicker. A lot of our feedback is that we're too slow, we're too focused on the methodologies, all that kind of stuff. So by changing that, we'll be able to deliver quicker to the lines of business. they are looking at the digital world, where it's 24/7 and they need to able to turn stuff around quickly so we need to be able to change to manage that as well.

Interviewer: are you aware of any HR models in the successful integration of teams iCompany A. So if we were to introduce that kind of DevOps team, as a manager are you aware of any kind of models that the organisation provides to support?

Interviewee: I suppose I wouldn't be fully aware of specific HR models. I know in the past before, Company A and Company B integrated in to Parent Company. They used to have a model where the team that was working on the project delivered it all the way through from test environments in to production. Now, maybe thats something we can look again and maybe we should do more of that and it also means that team supports

your operations once it's live. We've kind of moved away from that and maybe we need a hybrid of that and what we have with the DevOPs teams and I think that would work as a model.

Interviewer: If you were to approach a potential org change required for agil delivery, what would you suggest is done? i think you've just answered it there.

Interviewee: We are trailing this RDU, I would make that a permanent thing. I would have a project team thats in operations but their just delivering for the projects. It's means they can focus on that work and not get dragged in to outages or Priority 1 issues as they arise and it means that we'll get the work done and there are also, you are taking people out of the silo's that they are in withing say Networks or the Wintel team or the Middleware teams. They are actually one team now. I can see to you then now Gordon, my task is done and you are ready to do it straight away and that's where we get a lot of the delays at the moment.

Interviewer: Finally then, do you have any comments on how team members were managed or coordinated during the delivery of the project or the formation of the new team? Were they split between their operations roll and then all of a sudden on a project roll? How was that managed?

Interviewee: So what we did was, I was over that, especially for the project for corporate business so the one thing I did was I tried to remove any sort of blockers for them. So we did, manage to extract them out of their OPS rolls as much as possible. The odd time, you know a P1 issue would come up and they did have to go back but for the most part we made sure that they were able to focus just on the work they were doing for that Agile project that we were referring to. And the same for the RDU unit, the guys worked on that, they got 2-3 days a week assigned just to do that work and I've worked with the other managers to say look, can we make sure that they aren't getting dragged in to other things if there is issues the other members of the team are doing it. for the most part that has worked. i think the guys themselves have felt, like we've asked them for their feedback and they've said look I think this works. We're all actually in the room together, we're talking to each other, it's not through email necessarily as it used to be and things are actually getting done quicker. I know the other persons maybe an issue they have is stopping them from doing something but now I can help them doing something. There's definitely closer collaboration between the team members.

Interviewer: Just a follow on question from the DevOPS. Obviously integrating the DevOPS team in to the organisation, are there any other components that could improve agile delivery?

Interviewee: Good question, one of the areas that we still prob struggle with the LOB. we manage all the infrastructure, the test environments through to production. For

production we provide SLA's, I suppose the LOB's are looking for SLA's in their test environments. But one of the key areas is for the environment you would call pre-production which is supposed to be very similar to production and you're supposed to put your changes in there before you go live to make sure that the deployments work and there's no issues. I suppose a lot of the feedback we get from teams is that they would like to get a lot more access to those environments from an administration point of view. The issue we have is that being a financial institution we're heavily regulated and we've a lot of standards that we have to adhere to from an access point of view, especially if there's if any personal identifiable information or data which is classified as maybe as restricted in that pre-production environment so you can't just give out access to it. A lot of them don't have that stuff but we from an audit perspective, when we get audited we have to show, who has access, what they did, how did you track it, why did you give people access. If we open up that access, then it's very difficult for us to support the environment and also adhere to the standards or the IS standard controls that we have to adhere to. Thats an area that need to

Interviewer: Apologies for the interruption there? Anything else you would like to add?

Interviewee: No, just I think that's an area that if we could work on that and figure out a solution that worked for everybody, I know that would help in the development life cycle so thats an area that we are currently looking at.

Interviewer. OK, thanks xxxx, thanks for your time today

Interviewee: no problem

Appendix 8 - Project delivery Methodology (EUTSDM)