Gordon Institute of Business Science
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Understanding the success factors of a large-scale system implementation in an emerging market

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Abstract

The majority of large IT projects fail completely costing businesses billions with very little benefit to show for the money they've spent. This has prompted considerable, but indecisive, amounts of research regarding the reasons for project success and failure. This exploratory study uses a current case study to provide a high level conceptual model for project success. This model serves as both an academic summary of recent research as well as a high level blue print that can be used by organisations looking to implement large information systems. The study further concludes by providing a detailed risk formula that can be empirically tested in future research and used as an indicative measure of project specific risk.

Keywords:

Project management; Project success factors; Project implementation dimensions; Project risks; Portfolio risk management

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria.

It has not been submitted before for any degree or examination in any other University.

I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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Signature Date

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Chapter 1: Introduction to Research Problem

1.1 Introduction

Over the last decade, many major transformational information system projects have failed. The most recognised source of project success tracking the CHAOS Manifesto (Standish Group, 2013) found that only 39% of all projects are deemed successful. This number drops to only 10% for large-scale projects that take more than three years to implement (Standish Group, 2013). The majority of companies can survive these massive cost and schedule overruns, but it is estimated that a staggering 17% of IT project failures go so bad that they threaten the existence of a company (Bloch, Blumberg, & Laartz, 2012). These so-called black swan events (projects where the budget overrun is more than 200%) that could wipe out an entire company happen more often than expected and emphasises the need to understand the reasons for project failure.

The aim of this study is to identify the decision points, stakeholders and project variables that contribute to the success of a large transformational project and to understand the interdependencies that exist between these factors. This will be done by delivering a comprehensive conceptual model that contributes to current literature while also providing business with relevant criteria to implement successful projects and save billions in project failure costs.

1.2 Academic contribution

Although there exists an abundance of research on the reasons for project success and failure (Hidding & Nicholas, 2014), the key success factors in these studies still vary significantly and although there are some overlapping arguments and theories, most research has been reasonably indecisive (Fortune & White, 2006). More recent studies have focused on a new approach to project management commonly known as the Agile methodology (Highsmith & Cockburn, 2001). This methodology has been taken further by various authors (Goh, Pan, & Zuo, 2013; Hidding & Nicholas, 2009) to formulate theoretical models of implementation of the Agile Manifesto. These new principles have recently been tested, and early empirical results have been found for value-driven change leadership (Hidding & Nicholas, 2014). The majority of academic research, however, focuses on specific aspects of the project implementation, with

research focus shifting to the project management and implementation style as already mentioned.

Comprehensive strides have been made to identify and understand the various individual aspects of project management and the effect it has on overall performance, but there does not seem to be a universally accepted model that prescribes how to implement a project successfully. Results and findings vary greatly, as research focuses on the various implementation models and project structures that can be used to implement large system replacements (Thakurta, 2012). The international journal of project management and the management information systems journal are the primary sources of academic contribution relating to this complex issue with support from business research houses such as Mckinsey & Company, Deloitte and Gartner. The purpose and contribution of this research project would be to derive a consolidated conceptual model for the successful implementation of a large-scale information system. The model will combine the vast but disparate findings on the topic with an in-depth case study on the largest core system transformation on the African continent to date. The research will further aim to provide future researchers with a starting framework to build on and test across other large project implementations across the world. This research will endeavour to move the current trend away from in-depth project management reviews to a more holistic organisational view of project delivery.

1.3 Business contribution

Information systems are becoming an ever more important competitive component across a variety of industries. Project sizes and complexity are increasing, and projects now touch more elements of an organisation, thus creating a greater risk for a company if something goes wrong (Bloch *et al.*, 2012). Recent research on projects of more than US$15 million in size suggests that there is a 45% cost overrun, a 7% schedule overrun and a staggering 56% benefits shortfall across large project implementations (Bloch *et al.*, 2012). Large projects can contribute to a significant amount of an organisation's total cost. The best performing projects have reported IT costs of $8.81 per $1000 of revenue while bottom performing projects cost as much as $34.81 per $1000 of revenue (INEKO Institute at the University of Cologne, 2015). These project cost ratio is even higher when isolating the financial sector and is expected to increase as more firms migrate to new digital platforms to serve their customers.

The entire banking industry currently still runs on large legacy mainframe systems that have been built more than 30 years ago. These systems increase the risk to the financial sector and will have to be replaced in the next decade, as scale and complexity increase and banks move towards digitalisation. This migration from legacy systems to a new modern digital platform is often compared to changing the engine of a large aircraft mid-flight and will most likely be triggered by customer outages, fraud and competitor pressure during the next 10 years (Groenfeldt, 2015).

The replacement of legacy systems where there are 50 or more systems to replace is projected to, on average, overrun the initially planned budget by between $80 million and $100 million (Bloch *et al.*, 2012). For the large South African firms, this risk is even higher as they struggle to get skilled resources and are exposed to currency inflation when hiring skills from developed countries in Europe and the United States. These projects are often much larger than the average 12-month revenue of these firms and thus pose significant risks to the entire organisation should the implementation fail, overrun schedule and cost or not deliver the excepted business results.

This research aims – by using a very large, significant and current implementation as a case study – to provide businesses entering into large legacy system replacements with a comprehensive roadmap and approach to improve the probability of success. The next section will continue to provide a background to this study.

1.4 Case study background

This research was conducted on one of South Africa's largest institutions. This organisation is one of the first companies to attempt an information project of a large magnitude in any emerging market and was thus the perfect case study for this exploratory research. The specific case is often informally referenced in business schools across the world because of its pure magnitude and scale.

The project was started by the IT executive team of the organisation under study in 2005-2006 as a core system replacements initiative across the group. The intent of the project was first to replace the extremely outdated legacy system to ensure sustainability for the future and, secondly, to create a single view of the customer across the group. The initial phases included an immense amount of time and resources to plan and position the initiative and, by late 2009,

not a single line of code was written. After the first small product deliverable in 2010 failed dismally, the project underwent a total reset to evaluate the slow progress and extremely high-cost burn rate. The outcome of the reset was the dismissal of the two project sponsors and the announcement of a new project sponsor, namely, the chief executive officer.

The chief executive officer appointed a dedicated business executive to run the project full time in collaboration with the numerous IT executives that were responsible for delivery. The project team's first deliverable was to produce a compelling business case to justify the cost and explain the business benefits of the various releases. This was a fundamental change in the approach that moved not only ownership to the respective business units but also the overall objective of the implementation. During the next few years, the focus was purely on delivery and ensuring that deadlines were adhered to. This resulted in some satisfactory deliverables being delivered that saw the organisation win three international awards for leading the way in mobile technology. The excessive focus on the schedule, however, resulted in significant de-scoping of the original business case and delivery. As cost started to overrun to ensure enough resources were deployed to meet the stiff timelines, complex products and business units were completely removed from the project. This resulted in substantial changes to the business case, as the ultimate goal of a single view of a customer was clearly no longer obtainable.

In 2013, the project saw another change of sponsorship with the appointment of a new chief executive officer. This new chief executive put much emphasis on business involvement on the project and held the business units financially accountable for the success. This sparked a new wave of business interest and involvement to ensure that all deliverables were met. New business cases were created to defend and explain the project's current position, and another project reset took place as all requirements, measurement and business rationale were reviewed. During this phase of the project, cost started to escalate, as very expensive resources, often imported from Europe and various consulting houses, cost more than R2 million a day. The project missed two critical release dates during this stage of implementation. This was largely due to the review of requirements and the added scope due to previous deliverable de-scoping practices to deliver on time.

Extensive pressure from external analysts regarding the reported financial position of the project as well as significant cost and time overruns left the chief executive officer and executive committee with a difficult decision in the final quarter of 2014. The project had run for almost 10 years, at this point, with a total cost of more than R16 billion. This was far more than the

originally expected cost and time when the investment was first made. Furthermore, constant de-scoping of business requirements to assure deliverable dates were met had resulted in very little business benefit attributable to the project to date. Internal and external analysts were getting concerned with the expected return on investment and financial impact the project would have, and the executive committee had to make a decision on how long they would continue to support this asset.

Much research was carried out with companies in Europe and Australia that had undergone similar implementation to fully understand the decision at hand. A major Australian financial institution had spent more than R40 billion on a similar project and was deemed the best use case, as the institution used the same software that the organisation under study was using. With current costs at R16 billion, the team had to decide if they were willing to possibly spend more than double the current project cost to conclude this massive endeavour. The problem was that the net profit after tax (NPAT) cost ratio of comparative projects was completely different from that of this South African organisation. Large financial institutions worldwide reflected net profit after tax to project cost ratios of between 2.04 and 2.37 compared to this large emerging market corporate that only showed a 0.56 ratio. This was largely due to the fact that although the estimated cost of delivery was in line with industry standards across the world (+- R40 billion), South African corporates made more than 10 times less profits than their international counterparts.

After careful consideration, the project underwent its final reset at the end of 2014. It was concluded by the executive committee and the group board to refocus the project on regulatory requirements and ensure that the minimal required standards of a system upgrade were met. In essence, it had gone back to its original goal of legacy system replacement.

Chapter 2: Literature Review

2.1 Introduction

The preceding chapter provided an introduction and background to the study. This chapter will focus on a review of literature relevant to this study.

Information system implementations continue to have a very low success rate as only 39% of all projects are deemed successful according to the popular CHAOS Manifesto report by the Standish Group. Only 10% of large IT implementations are successfully implemented (Standish Group, 2013). A further 52% of projects are challenged, with 38% completely failing. Table 2.1 shows the year on year success rates as published in the yearly CHAOS Manifesto report.

Table 2.1: Information systems success rates

IT projects success rates					
Project Status	2004	2006	2008	2010	2012
Successful	29%	35%	32%	37%	39%
Failed	18%	19%	24%	21%	18%
Challenged	53%	46%	44%	42%	43%

Source: Standish Group (2013)

Although there have been some pieces of research that have challenged the validity of the Standish Group CHAOS report (Eveleens & Verhoef, 2010), it is still commonly accepted and regularly cited as an accurate estimation of information system implementation success. Research by Sauer, Gemino, and Reich (2007) further supported the CHAOS findings and conclude that project size increases the risk of a project underdelivering. They estimated that 9% of information system projects are abandoned before they are completed.

2.2 Reasons for information system failures

According to Hidding and Nicholas (2014), there are two main schools of thought regarding the success and failure of information system projects. These two views originate from the work of Drucker (1967) who argued that a successful executive should focus on effectiveness (doing the right things) instead of efficiency (doing things right). The two main schools of thought as summarised by Hidding and Nicholas (2014) are thus categorised as the efficiency and

effectiveness schools of thought. Research relating to the efficiency of an information system project is largely focused on project management, whereas research done on effectiveness takes an external view of the project and focuses on the stakeholders, outcomes and the technology. Cooke-Davies (2002) supported these views by defining project success into three fundamental questions, (1) “What factors lead to project management success?” (2) “What factors lead to a successful project?” and (3) “What factors lead to consistently successful projects?” These three questions align with the two schools of thought that focus on project management (efficiencies) and the project outcome (effectiveness) but allow for a third deliverable of continued success.

2.2.1 The efficiencies (project management) view of project success and failure

Kolltveit, Karlsen, and Gronhaug (2007) identified six different perspectives of project management, namely, (1) task, (2) leadership, (3) systems, (4) stakeholders, (5) transaction cost, and (6) business. Their findings concluded that recent focus has shifted to the leadership and task perspectives. These two perspectives make up the bulk of the research done in the project management view of succeeding information system implementations.

2.2.1.1 Leadership project management perspectives

Belout and Gauvreau (2004) found that although there was a link between human resource management – as a project management dimension – and the overall success of the project, it did not have a significant effect on the outcome of the programme. It is however interesting to note that according to Pollack (2012), the success of a complex knowledge transfer organisational change project was largely driven by the organisation’s emphasis on visibility, senior management support and the enthusiasm of the participants. Remington and Pollack (2007) found that there are four distinct areas of complexity that will increase the uncertainty of the stakeholders involved. According to their study, the uncertainty in structurally, technically, directionally and temporally complex projects have a major effect on the ability of leadership to influence the successful outcome of a project.

In their meta-study, DuBois, Hanlon, Koch, Nyatuga, and Kerr (2015) found that certain leadership traits strongly correlated with project success. They concluded that a successful project manager should not only have an in-depth technical knowledge but also show significant leadership and interpersonal skills. The study concluded that managerial competence,

emotional competence, openness, communication, inspiration, investigative, enterprising and entrepreneurialism were the traits that had the most significant correlation with project success. Successful project management is no longer attributable to the use of proper project management tools and techniques but rather to the management skills of the individual (Korrapati & Rapaka, 2009). Their research concludes that management and leadership styles were higher contributors to overall project success than technical competencies.

Project managers managing a project where there is a clear overlap between their personality type and the project type performs significantly better than the average manager (Malach-Pines, Dvir, & Sadeh, 2008). The research also indicated that the project managers preferred projects that match their personality type, and thus most project managers specialise in specific types of project implementations. Project types are distinguished based on four main drivers, namely, (1) complexity, (2) technology, (3) novelty, and (4) pace (Malach-Pines *et al.*, 2008). Each project type is associated with a variety of personality types that allow for the cross-pollination of the project and the personality of the preferred project manager.

The way in which the leader of a project influences the project members impacts the ultimate success of the project (Narayanaswamy, Grover, & Henry, 2013). Influence tactics can be used to predict and overcome control loss (early slippages in the project delivery). It has been shown that early slippages (control loss) have a negative correlation when communicational congruence is achieved regarding the chosen influence (Narayanaswamy *et al.*, 2013). Communicational congruence refers to the communication from the leader to the project team, whereas perceptual congruence refers to the overall perception of the leader and his leadership style in relation to the team dynamic.

According to Jiang, Chang, Chen, Wang, and Klein (2014), there is a clear need for an internal conflict management programme to ensure alignment between all programmes and stakeholders. They further concluded that a shared understanding of the overall goals and the interdependence between individual goals has a positive effect on the final outcome of a programme.

2.2.1.2 A task perspective of project management

The case study done on the World Bank unpacks the key success factors of major projects within a big corporate. Ika, Diallo, and Thuillier (2012) found that the success factors that result in project success for the World Bank are a multi-dimensional view across a variety of different areas. The five key success factors identified in the World Bank study are monitoring, coordination, design, training, and the institutional environment. An interesting observation made by Ika *et al.* (2012), however, is that these success factors change dependent on the perspective of the stakeholder.

In a study by Cooke-Davies (2002) on 136 projects, there was surprisingly no correlation between cost overruns and schedule delays. However, the author went on to explain that this is largely because mean performance against budget is generally better than the mean performance against schedule for the observed projects. He also found strong correlations between both the cost and the schedule of the project and the eight project management practices. The maturity of an organisation's risk assignment, a comprehensive risk management education programme, a visible risk register and an up-to-date risk management plan were all found to strongly correlate with on-time delivery. The other four practices identified by Cooke-Davies (2002) are a well-documented project responsibility matrix, a shorter project life (no longer than three years – preferably only one year), a mature scope change process, and a baseline measurement that maintains its integrity, which all correlate strongly with overflowing costs.

Requirements volatility is one of the biggest risks to any information system implementation. This risk is influenced and/or managed by the choice of the adopted project execution strategy (Thakurta, 2012). Table 2.2 depicts the seven core execution models, each with their own advantages and disadvantages. It was further found that although certain execution strategies cater for changing requirements that only 50% of projects follow a specific step-by-step software development execution strategy.

Table 2.2: The seven core software execution models

Model	Definition	Advantages	Disadvantages
Waterfall	A software development model in which development proceeds sequentially through various phases	Well defined; easy to manage; well documented; good governance	Not suitable for complex projects; cannot accommodate change; development only occurs late in the cycle
V-Shape Model	An extension of the Waterfall approach, but instead of a linear downwards movement, the process bends upwards after the coding phase	Simple and easy; more flexible than Waterfall, as test cases are identified much earlier	No early prototypes; not flexible as per the traditional Waterfall approach
Prototyping model	A model that starts with requirements and follows with multiple prototypes and user evaluation	Exposes users to solution early; reduces development time and cost; quantifiable user feedback	Risk of incomplete documentation and/or systems; unrealistic user expectations can be created by simple prototypes; not implementable for large-scale projects
Incremental iterative model	Software broken into many iterative mini-Waterfall models	Easier risk and scope management than traditional Waterfall; results are obtained earlier	More resources; could lead to architectural issues; not very suitable for change
Spiral model	An incremental model with a bigger focus on managing risk	Smaller developments; change can be accommodated; allows for prototypes	Management is complex; resource requirements are high; only suitable for component-based projects that are scalable
Rapid application development model	A model that allows software programs to be built in as little as 60-90 days, often with some compromises	Quick delivery; can accommodate change	Requirements need to be well known; requires high user involvement; suitable only for shorter time-based implementations
Agile	A new evolutionary approach performed by highly collaborative self-organised teams	Great for changing environments; deliver early partial working solutions; minimal rules and documentation	Not suitable for very complex projects; overall agile leader is a must; strict delivery management needed

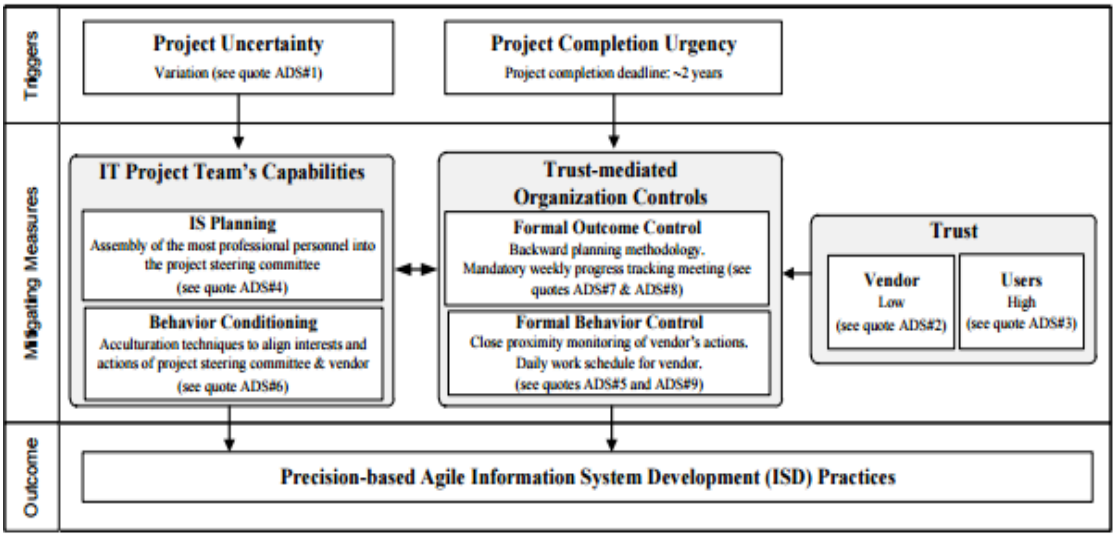
Source: Thakurta (2012)

2.2.1.3 A new wave of thinking: Agile project management

Since the publication of the very popular Agile Manifesto (Beck *et al.*, 2001), there has been great focus on the principles of Agile projects and their perceived much higher success rates. The early pioneers of Agile (Highsmith & Cockburn, 2001) concluded that many new IT projects that adopted the Agile approach were deemed successful. Highsmith and Cockburn (2001) found that teamwork and team proximity (especially between business and their IT colleagues) were key success factors of the Agile methodology. Other key elements of success in agile programmes were continuous communication and regular feedback regarding technical decisions, business requirements and constraints.

During their multiple case study research on the building of Beijing Capital International Airport, Goh *et al.* (2013) found that there were two crucial factors that influenced the development of agile information systems, namely, (1) the urgency of the project and (2) the urgency to conclude the implementation. The authors further concluded that very large information system implementations have a much higher probability of creating uncertainty with stakeholders, thus negatively affecting delivery. The research also contributes four models of agile information system development practices, namely, (1) adeptness-based, (2) pre-emptive-based, (3) precision-based, and (4) improvement-based. These models act as enhancements to practitioners' agile methods like "scrum" and are some of the first theoretically based illustrations of the methodology.

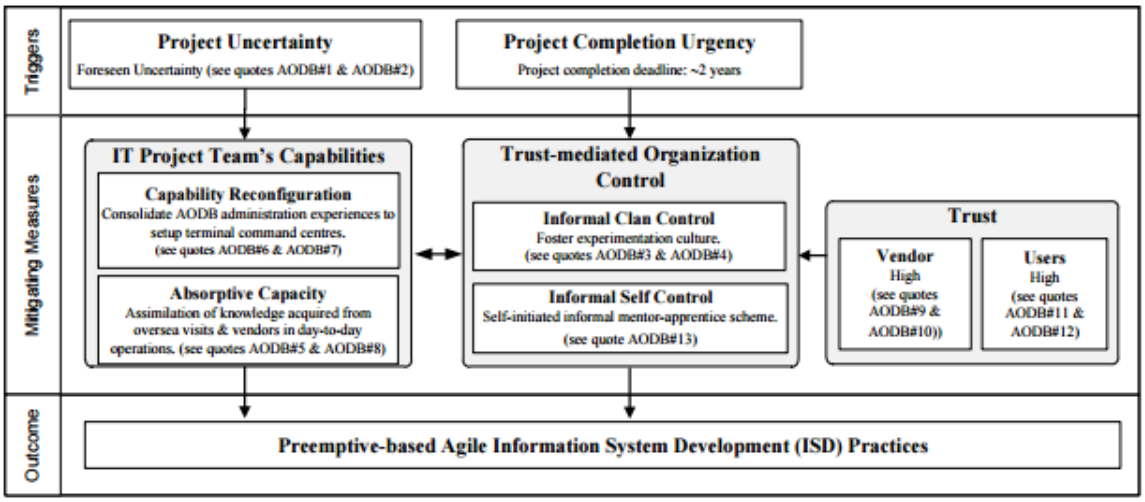
Figure 2.1: Precision-based agile development practices



Source: Goh *et al.* (2013)

The precision-based agile development practice in Figure 2.1 leverages two key IT project team capabilities, namely, (1) the information system planning capability and (2) the behavioural conditioning capability. These two core capabilities are used to address the variation uncertainty in a project. Together with formal project control such as weekly planning sessions, this leads to a more precise implementation and design of the deliverables.

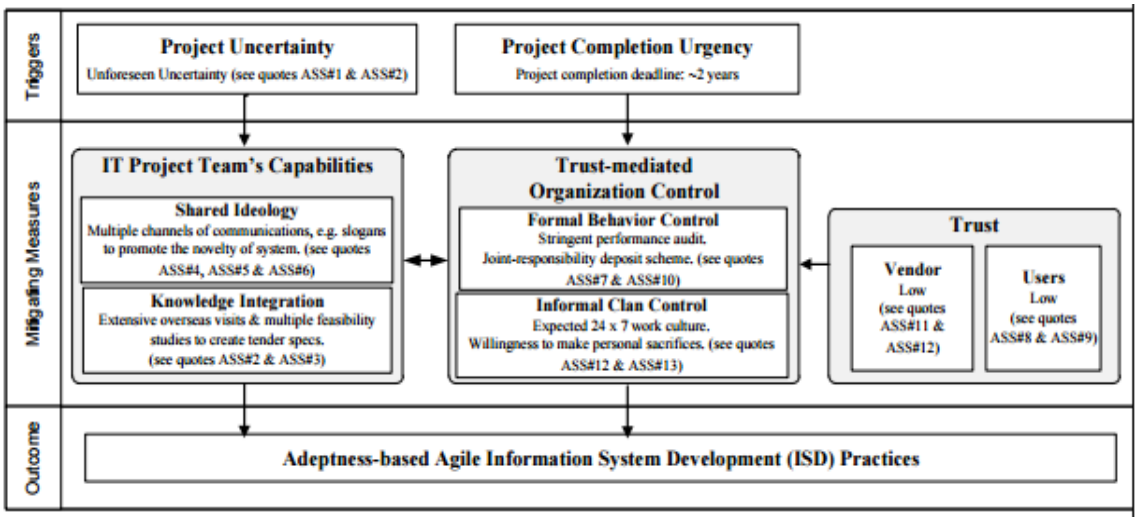
Figure 2.2: Pre-emptive-based agile development practices



Source: Goh *et al.* (2013)

In addressing foreseen uncertainty (a few known factors that will influence the project's outcome significantly but in an unpredictable way), the IT team leverages two core capabilities, i.e. (1) capability reconfiguration and (2) absorptive capacity, as illustrated in Figure 2.2. This refers to the organisation's ability to realign and restructure its current capabilities in response to environmental changes and to identify, learn and exploit these external factors. This requires no formal organisational controls and will evolve naturally from the project team. These capabilities allow an organisation to be pre-emptive in its information system delivery.

Figure 2.3: Adeptness-based agile development practices

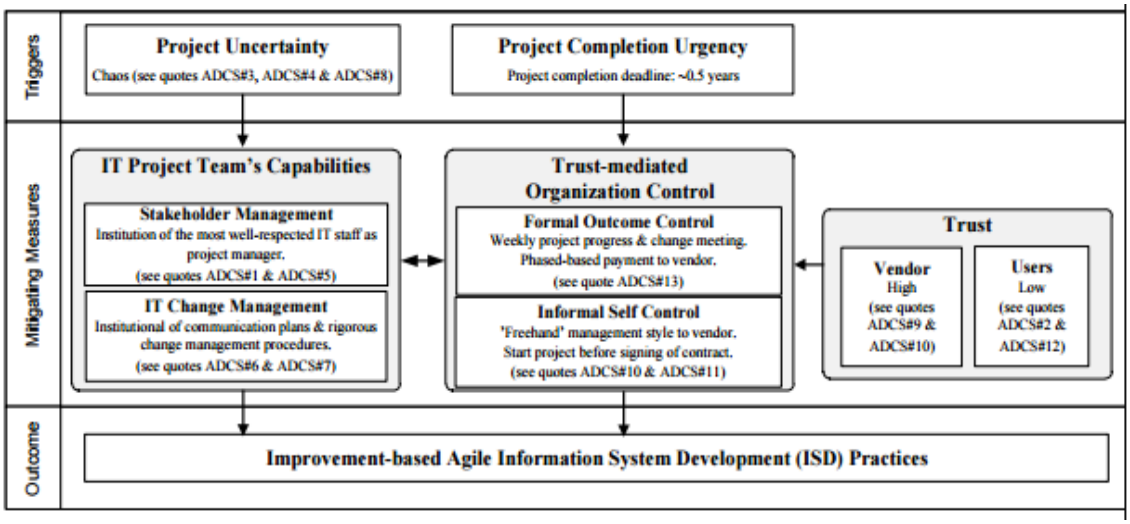


Source: Goh *et al.* (2013)

To address the unforeseen uncertainty factor (one or more factor that will influence the project outcome significantly but are known in advance), the project team leveraged the following two capabilities: (1) a shared ideology and (2) knowledge integration. These are indicated in Figure 2.3. A shared ideology refers to the team's ability to create an organisation-wide vision and interpretation among all project stakeholders. Knowledge integration is the ability of the team to negotiate a shared understanding of the delivery, design and implementation process. This is especially critical for technical resources and their ability to inform business users of complex design issues.

Both formal and informal organisation controls can be applied to ensure the successful adoption of adaptive development practices. Informal controls include the team's willingness to make personal sacrifices and work extensive hours to cater for any project or business rule changes. Formal controls focus on creating a shared responsibility among the technical and non-technical resources as well as regular performance audits.

Figure 2.4: Improvement-based agile development practices



Source: Goh *et al.* (2013)

Figure 2.4 reveals that (1) change management and (2) stakeholder management are the two core project team capabilities identified to address project chaos (unforeseen events that completely invalidate the project target, plan or approach). These capabilities refer to all stakeholders and processes internal and external to the organisation, i.e. customers and employees. Both formal and informal organisational controls such as regular change and feedback meetings can be implemented to support improvement-based agile development.

These capabilities are often the most important but also the most difficult to measure during the project implementation.

2.2.1.4 Value-driven change leadership

Value-driven change leadership (VDCL) is a paradigm shift in the project management thinking when it comes to large information system implementations (Hidding & Nicholas, 2009). Value-driven change leadership consists of nine principles that are categorised into three broader themes, namely, (1) value-added over budget/schedule, (2) business solution over architecture framework, and (3) human change over repeated effort. The principle in the value-driven change leadership approach aligns with the Agile methodology and focuses on a new way of implementing information system projects while not neglecting the necessary governance. Further, Hidding and Nicholas (2014), in their follow-up research, found empirical evidence relating to increased project success due to a list of factors from the traditional project management as well as the value-driven change leadership approaches.

2.2.2 The effectiveness (project success) view of project success and failure

Project management success and project success are not one in the same and should be reviewed in isolation when unpacking overall programme performance (Cooke-Davies, 2002). Project success deals with the effectiveness of a project (Hidding & Nicholas, 2014) and focuses on the multiple stakeholders involved as well as the ultimate results of an implementation (the benefits of the programme). Through the findings of Cooke-Davies (2002), it was established that through clustering the 60 core elements that are essential to every project manager's success, the anticipated benefits were the key measure for formal and informal reviews during the project life cycle. It is however interesting to note that only 13% of projects track actual financial benefits post completion (Hidding & Nicholas, 2014).

2.2.2.1 Benefits tracking and project measurement

You get what you measure. Regardless of the definition of a metric, whenever it is used to evaluate and rate a team's performance, the value of the metric will move towards the desired value (Bouwers, Visser, & Van Deursen, 2012).

The accurate measurement of information system projects remains a common problem that should be measured in two categories, namely, (1) process efficiency and (2) overall

effectiveness (Basten, Joosten, & Mellis, 2011). Basten *et al.* (2011) further concluded that adherence to planning (ATP) has no effect on the overall success of the project and is not an accurate measure of project efficiencies. The authors found that concentrating on the resource ratio to achievements and customer satisfaction was respectively the two best measures of process efficiency and project success.

In very recent research on the impact of measurement during the efficiency stages of a project, Chen (2015) concluded that performance changes in the execution phase of a project explained a large percentage of the overall project outcome. Chen (2015) also suggests that the appropriate performance measurement during this phase can successfully predict the outcome of an overall project and help management to terminate projects before they spend large amounts of capital.

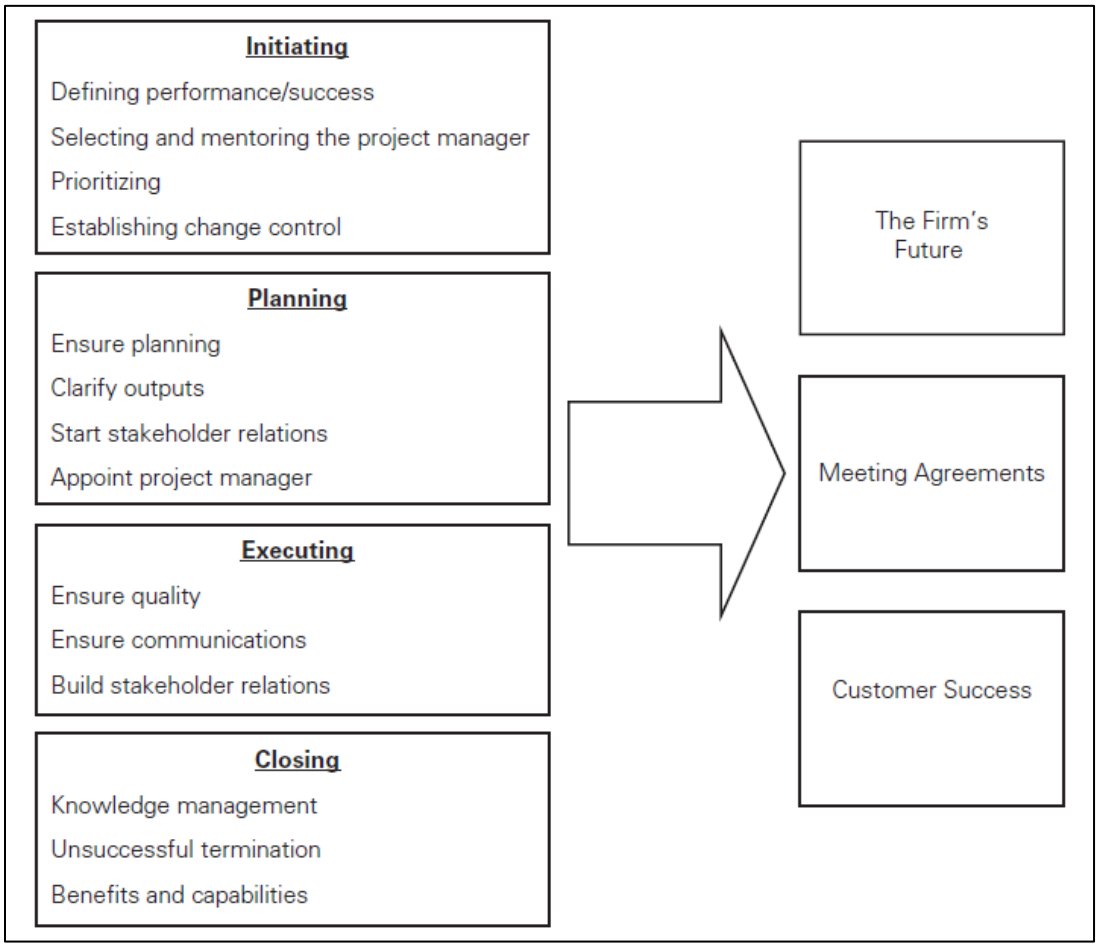
There are four main dimensions of project measurement: (1) delivery capability, (2) organisational capability, (3) marketing capability, and (4) innovative capability (Shao, Muller, & Turner, 2012). The delivery capability dimension measures the success of a programme from the perspective of what the programme was supposed to achieve and is usually based on stakeholders' satisfaction and/or financial results. The organisational dimension, on the other hand, focuses on the improvement the programme had in terms of organisational capacity. This can either be a hard measure (cost reduction through efficiencies) or a soft measure (improving the culture of the organisation). Marketing capability measures the interconnectivity between different programmes and the organisation's strategy. The innovative measure of project success measures a programme purely from a technological point of view and assesses if new technology and capabilities, which will add a competitive advantage in the future, were delivered during a programme.

An interesting view on project measurement suggests that uncertainty is a very important but difficult to quantify measure for all project managers (McLain, 2009). McLain (2009) further suggested that project uncertainty can be measured by understanding three core metrics, namely, (1) interdependencies between activities, (2) activity durations and rework, and (3) unfamiliarity and rework of activities (McLain, 2009). Thea author concluded that by providing a numerically quantifiable score for each one of these categories, project managers will be able to quantify the uncertainty in a large-scale project deliverable and make the necessary changes to reduce the risk of non-delivery and budget overrun.

2.2.2.2 Stakeholders affecting project success

Having executive sponsors that are actively involved in the implementation of a project is the key factor to project success (Kloppenborg & Tesch, 2015). Executive sponsors and their behaviours during the various stages of a project implementation impact the overall success of an implementation (Kloppenborg, Tesch, & Manolis, 2014). Figure 2.5 illustrates the various behaviours the executive sponsor has to fulfil across the project life cycle that will affect the outcome of the programme.

Figure 2.5: A conceptual model of project sponsor behaviours that impact project success



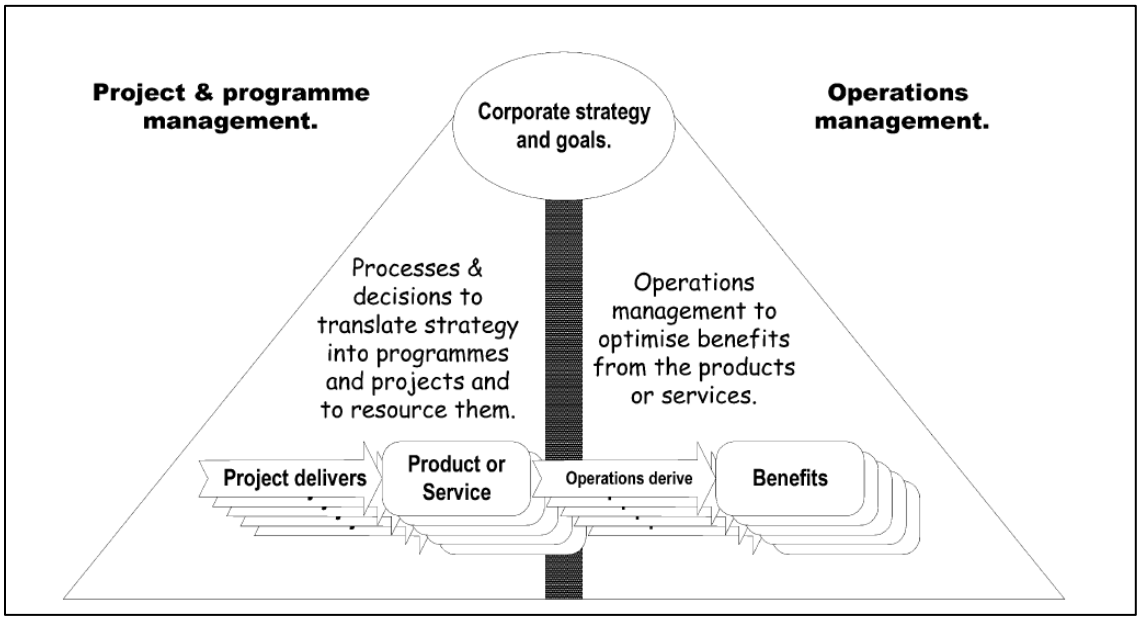
Source: Kloppenborg *et al.* (2014)

From this research, it is suggested that there is a need for significant involvement from the project sponsor during all four steps of a typical project life cycle. The conclusion from the model is that the executive sponsors' actions directly influence project success, especially relating to

the firm's future sustainability, meeting predetermined agreements and ensuring customer success.

Furthermore, Cooke-Davies (2002) concluded that the success of a programme is not only influenced by the manager and project team but also by the adoption and buy-in of the operational and line managers. Figure 2.6 highlights the relationship between the project team and operations and illustrates the role of the day-to-day operational area to fully realise project benefits.

Figure 2.6: The project value chain



Source: Cooke-Davies (2002)

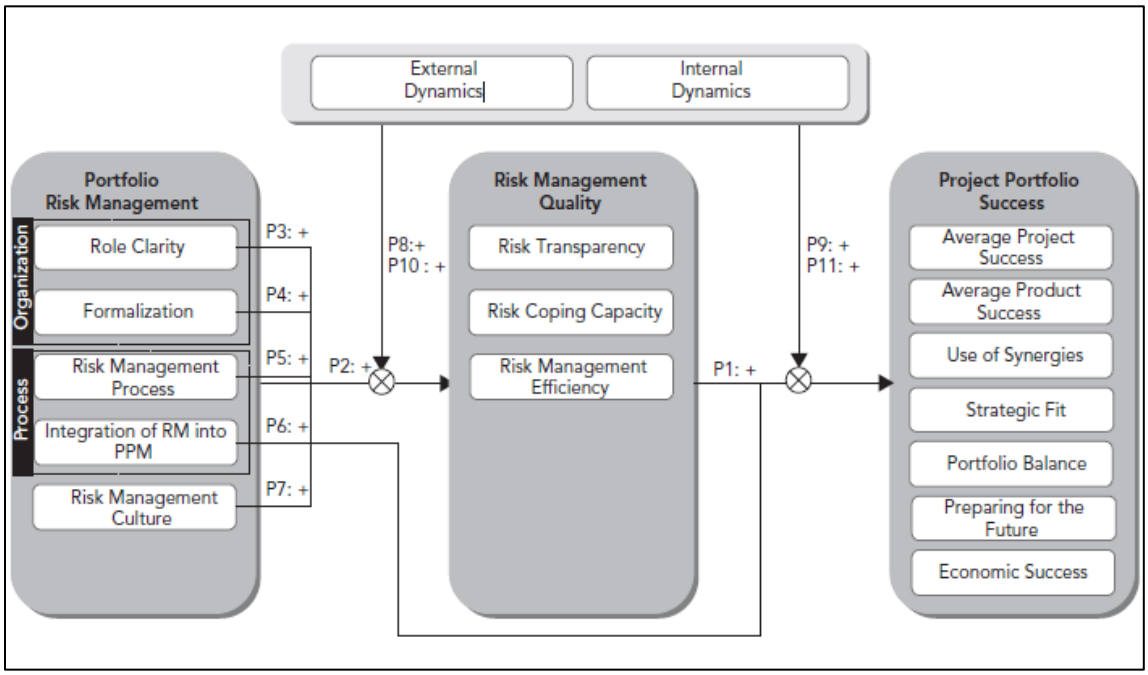
Project termination does not always imply project failure (Boehm, 2000). Organisations need to take on risky programmes from time to time to ensure they maintain a competitive advantage. It is the role of the senior leadership team to terminate all projects that no longer conform to the strategy of the organisation (Unger, Kock, Gemunden, & Jonas, 2012). Unger *et al.* (2012) concluded that senior management involvement has an inverted u-shape relationship with project termination. This leads to the extension of senior stakeholders' pet projects even though they add no customer or organisational value.

2.2.3 Risk management and information system success

Risk management stretches across both the effectiveness and efficiency life cycles of a project and is made up of two key categories: (1) hard side risk management (efficiency and project-specific risk factors) and (2) soft side risk management (effectiveness and external risk factors) (Carvalho & Rabechini Junior, 2015). Carvalho and Rabechini Junior (2015) found a significant correlation between project success and risk management in large-scale projects, with 10.72% of the success in projects being attributable to the soft side of risk management. A further correlation between soft side and hard side risks such as the environment of the business, as an example, led the authors to conclude that more than 25% of project success could be influenced by soft side and external risk management.

Research regarding portfolio risk management shows that project risks can be categorised into three core categories. The categories include (1) organisational risks, (2) process risks, and (3) culture risk (Teller, 2013). Teller (2013) produced a comprehensive conceptual model for managing risk across the project and risk life cycle, as can be seen in Figure 2.7.

Figure 2.7: A conceptual framework – Portfolio risk management and project success



Source: Teller (2013)

The model depicted in Figure 2.7 aligns with the efficiency and effectiveness success factors towards project success. The portfolio management factors (organisation, process and culture) are first defined in terms of the stakeholders and approach to be used. These risks are then managed as part of the project efficiencies and later measured as part of the overall project success factors. It is important to note that various external and internal dynamics can influence the identified risks. The more external and internal dynamics present, the greater the effect of portfolio risk management on the overall success. These dynamics act as multipliers in the conceptual model in Figure 2.7.

Barki, Rivard, and Talbot (2001) identified five core dimensions of software risk management, which are (1) technological newness, (2) application size, (3) lack of experience, (4) complexity, and (5) organisational environment. They further asserted that risk management for a software implementation is influenced by the overall risk exposure and size of the project and that these variables will affect the level of involvement needed as per the three constructs of risk management: (1) internal integration, (2) user participation, and (3) formal planning.

According to Teller, Kock, and Gemunden (2014), risk management practices at various management levels are highly relevant for project success. They further concluded that there is a clear need to understand the effect of project portfolios and not only single project risks that affect the outcome of a large project. Their findings also established that when risk information is integrated at the portfolio level, it increases the positive effects at an individual project level. This study also supports the claims that a firm should tailor its risk management framework to its environment. Teller *et al.* (2014) further maintained that formal portfolio risk management might lead to the postponement or even cancelation of certain projects as a result of external risk factors to the project. Projects that are highly dependent on research and development (R&D) and are more exploratory in nature benefit the most from the portfolio risk view.

Elzamly and Hussin (2014) indicated that there are various risk rankings for each identified risk during a software project's implementation and that these risks are highly dependent on the level of experience of the project manager. Table 2.3 illustrates the finding of Elzamly and Hussin (2014) and ranks the 10 biggest risks during the implementation phase based on three categories of project management tenure. It is interesting to note that the more experienced a project manager becomes, the higher the risk of personal shortfalls from the manager becomes. The authors also came to the conclusion that each risk has a different impact on the overall delivery as illustrated by the fit (R2) of each variable as depicted in Table 2.4.

Table 2.3: Project risk rankings during the implementation phase

		Risk Ranking according to PM experience		
Risk number	Risk description	Experience 2-5 Years	Experience 6-10 Years	Experience > 10 years
RISK 1	Failure to gain user commitment	6	6	3
RISK 2	Personnel shortfalls	2	3	10
RISK 3	Failure to utilize a phased delivery approach	3	1	9
RISK 4	Too little attention to breaking development and implementation into manageable steps	7	2	2
RISK 5	Inadequate training team members	10	8	4
RISK 6	Inadequacy of source code comments	5	10	1
RISK 7	Inadequate test cases and generate test data	1	9	5
RISK 8	Real-time performance shortfalls	4	4	7
RISK 9	Test case design and Unit-level testing turns out very difficult	8	7	6
RISK 10	Lack of adherence to programming standards	9	5	8

Source: Elzamly and Hussin (2014)

Table 2.4: R2 values of the top 10 risk factors during the implementation phase

Risk number	Risk description	R2 value
RISK 1	Failure to gain user commitment	0.085
RISK 2	Personnel shortfalls	0.181
RISK 3	Failure to utilize a phased delivery approach	0.133
RISK 4	Too little attention to breaking development and implementation into manageable steps	0.254
RISK 5	Inadequate training team members	0.252
RISK 6	Inadequacy of source code comments	0.056
RISK 7	Inadequate test cases and generate test data	0.105
RISK 8	Real-time performance shortfalls	0.301
RISK 9	Test case design and Unit-level testing turns out very difficult	0.281
RISK 10	Lack of adherence to programming standards	0.327

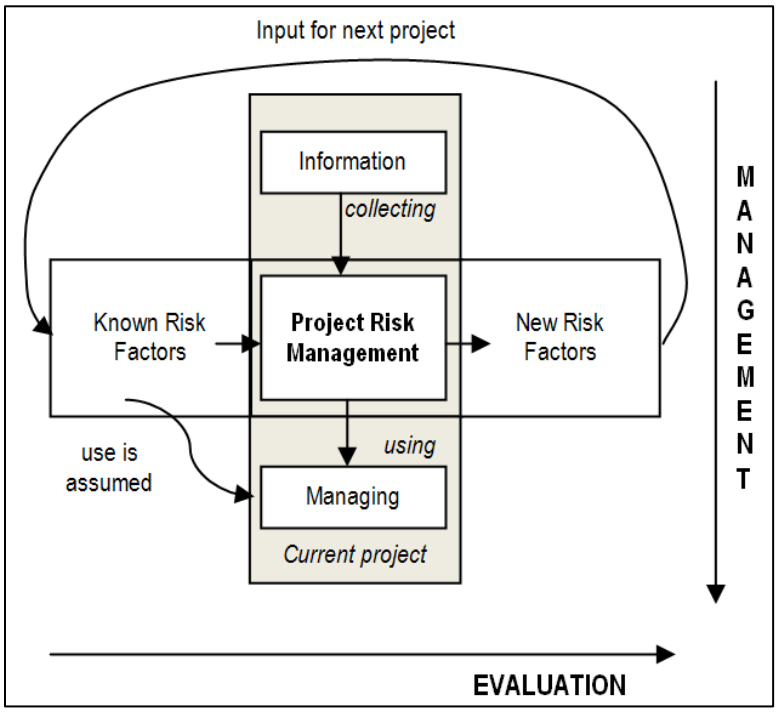
Source: Elzamly and Hussin (2014)

Project-specific risk during the implementation phase could thus be significantly reduced by using project managers with experience of 6-10 years, as they score the lowest against the highest contributing risk factors. Thus, Elzamly and Hussin (2014) clearly showed the need for a multi-level risk management framework across all project categories.

There are two main risk management approaches that have been well researched in the implementation of information system projects, namely, (1) the management approach and (2) the evaluation approach (Didraga, 2012). The management approach deals with the important question of how to deal with risks to prevent project failure, while the evaluation approach

focuses on what causes projects to fail. Figure 2.8 illustrates a combination of both risk management approaches. Didraga (2012) contended that risk factors identified in previous projects contribute to the success of current project success. It is however stated that the risk knowledge alone will not increase the probability of success and that active risk management based on the information is needed.

Figure 2.8: A combined risk management approach to project implementations



Source: Didraga (2012)

2.3 Conclusion

There is a plethora of literature regarding the different reasons for failed projects (Hidding & Nicholas, 2014). According to Fortune and White (2006), the critical success factors identified in this field of study vary to a considerable extent, and although there are some overlapping arguments, they have been reasonably indecisive. The literature varies from in-depth project management fundamentals to stakeholder theory and the impact of external environmental factors.

Great emphasis is placed on the project management life cycle (efficiency school of thought) and the role, as well as the influence, of the project manager on the overall outcome of a

project. The way a project is executed (Waterfall vs. Agile) has been debated in numerous research papers but with little or no empirical evidence of a preferred approach. Recent literature actually posits that the best approach for a project would differ based on the type, size and timelines of the implementation, and that the best execution method would thus vary from project to project.

Research regarding the effectiveness school of thought has increased in the last three years, with the majority of available research focusing on the overall outcome and value of a project. Very recent research has started looking at the role of the sponsor and the linkages between the measurement and benefit tracking of the programme. There has also been some literature on the importance of risk management during a programme implementation. This literature was added post the initial exploratory interviews, as risk management was raised on numerous occasions by the chief information officer of the organisation under study.

There does not seem to be an end-to-end model that successfully encapsulates the entire project life cycle and the various factors that influence project success. The researcher thus strongly believed that there would be great academic benefit to a structured high-level conceptual model that captures all the success factors across the entire life cycle. The next chapter will focus on research propositions and questions.

Chapter 3: Research Propositions and Question

3.1 Introduction

The previous chapter discussed literature pertinent to this study. This chapter will focus attention on research propositions and questions of this study.

More recent studies regarding project success have largely focused on the various approaches to project management and, in particular, to a new methodology commonly known as the Agile method. This methodology has been adapted by researchers to formulate theoretical models of implementation of the Agile Manifesto. These studies form what is referred to as the efficiency school of thought and is the most commonly researched topic for large project implementations in recent years. Other recent research focuses on the effectiveness of projects, particularly relating to the measurement of success and the influence of external stakeholders. Project risk management and end user adoption make up the rest of the recent literature and form part of the effectiveness school of thought.

The literature in Chapter 2 supports the research of the following five propositions, as this will add significant value to both the academic as well as the business community.

3.2 Research propositions

The following propositions were identified in this research:

1. The effectiveness school of thought pre and post implementation plays a major role in the overall outcome of a project.

2. The time to achieve considerable business value and thus the project management and efficiency of the implementation has a significant impact on cost and schedule overflows.

3. Line managers and senior sponsors' inability to terminate the project after initial results pointed to failure and their ability to accurately measure success had a significant impact on cost and schedule overflows.

4. The lack of early identification of project risks and an appropriate risk management framework contribute significantly to the outcome of a project.

3.3 Research questions

The research questions that follow were instrumental in addressing the research problem:

1. What effectiveness-related project inflection points and actions contributed to the overall outcome of the project?

2. What efficiency (project management) project actions contributed to the overall outcome of the project?

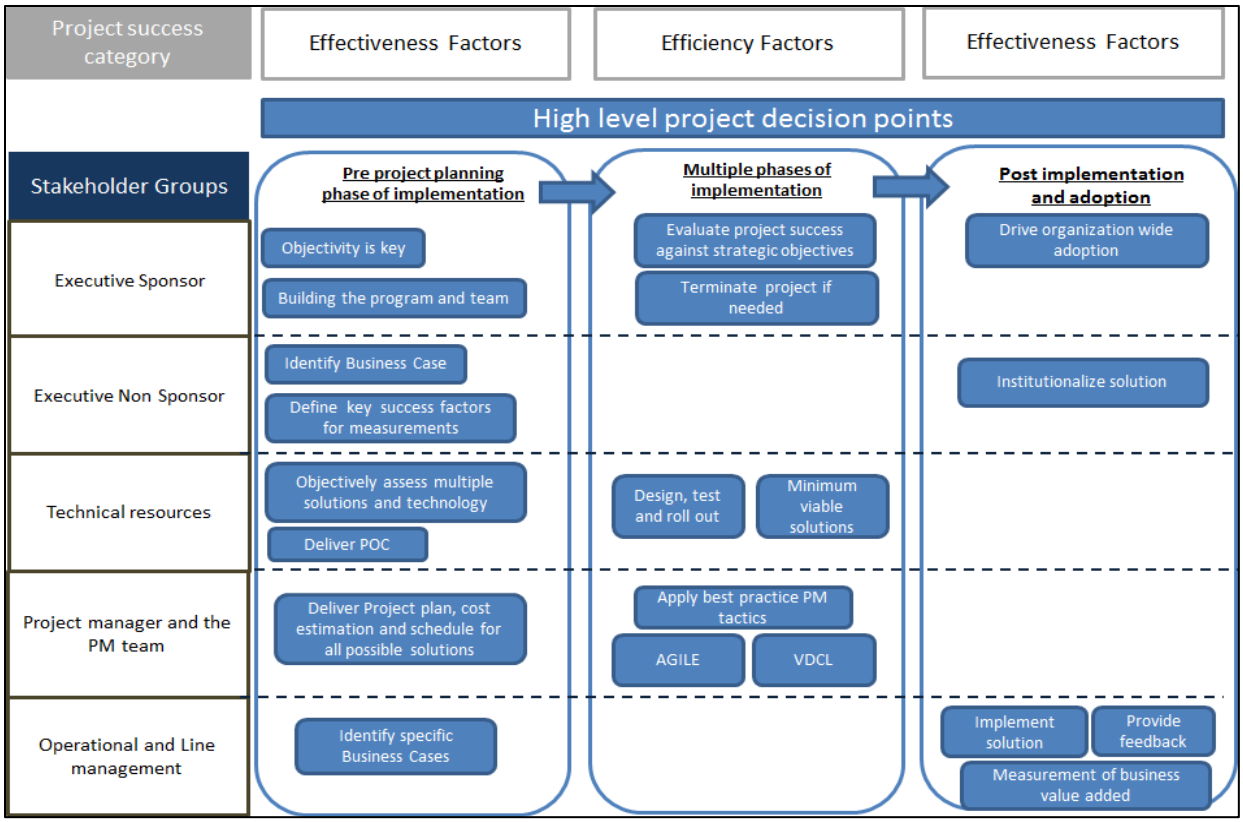
3. Why are projects not terminated during the original review phases when cost and schedule were clearly overrun?

4. What attributes and events significantly increase the risk of project on-time and on-schedule delivery?

3.4 A de jure model for the successful implementation of large transformational projects

The model depicted in Figure 3.1 is the researcher's own de jure model for the successful implementation of transformational projects. It is based on the researcher's synthesis of the literature and reflects three key areas, (1) project success category, (2) stakeholders and (3) project decision points as well as the actions within each category that are needed for project success. The model also includes key actions for each stakeholder group during the specific phase of the project.

Figure 3.1: The de jure model for project success



3.5 Conclusion

In this chapter, the research questions of the study were presented. Research propositions were also identified. A de jure model for the successful implementation of transformational projects was also provided. In the chapter that follows, the research methodology used in this study will be discussed.

Chapter 4: Research Methodology

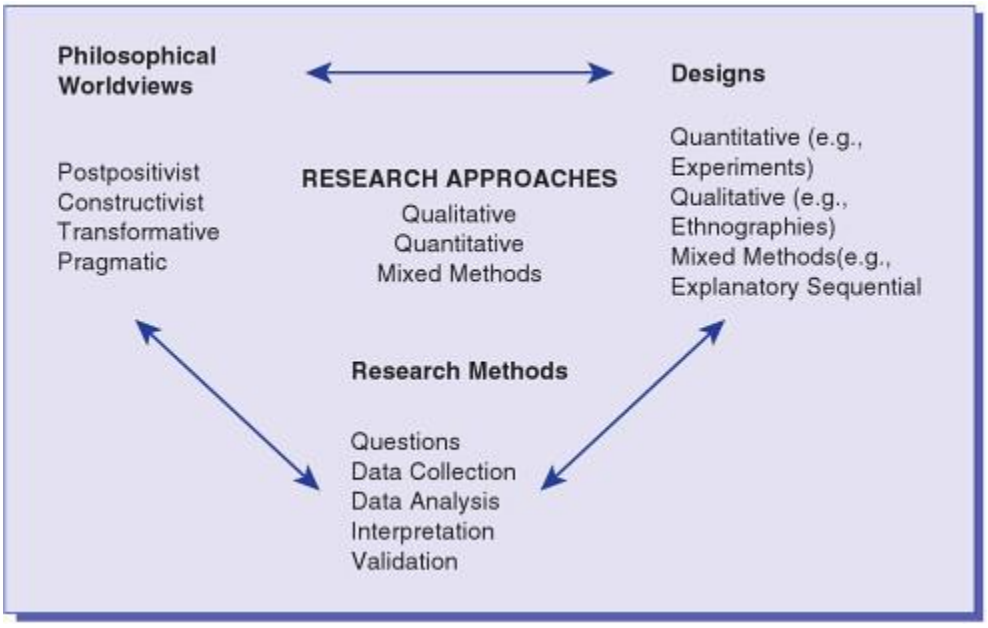
4.1 Introduction

In the foregoing chapter, the research questions and propositions for this study were presented. This chapter will discuss the research methodology employed in this study, as well as the research design.

4.2 Research design

A research approach involves internal philosophical suppositions as well as external methods and procedures (Creswell, 2014). These components form part of the overall research framework as illustrated in Figure 4.1.

Figure 4.1: A framework for research



Source: Creswell (2014)

There are three core research approaches according to Saunders and Lewis (2012) that aim to answer the what, why and the where to research. Descriptive studies aim to answer the "what" of a specific topic and are usually quantitatively based. Explanatory research aims to determine causality and will always have quantitative roots. In contrast, the aims of exploratory research

are to identify new avenues of research, and it is usually associated with qualitative research. In some cases, mixed method studies can be applied to enrich the depth of a specific study.

Mixed method research involves the integration of both qualitative and quantitative data and has become much more popular over the past few years (Creswell, 2014). According to Creswell (2014), there are three main designs in mixed method research, namely, (1) convergent, (2) explanatory sequential, and (3) exploratory sequential.

4.2.1 Convergent mixed method research

The convergent mixed method refers to a research approach where the qualitative and quantitative data are simultaneously collected to comprehensively explain a specific research problem.

4.2.2 Explanatory sequential mixed method research

An explanatory sequential study will start with a high-level quantitative study where the researcher builds an initial base of findings. A qualitative analysis is then done to further clarify and provide depth to the study.

4.2.3 Method selection

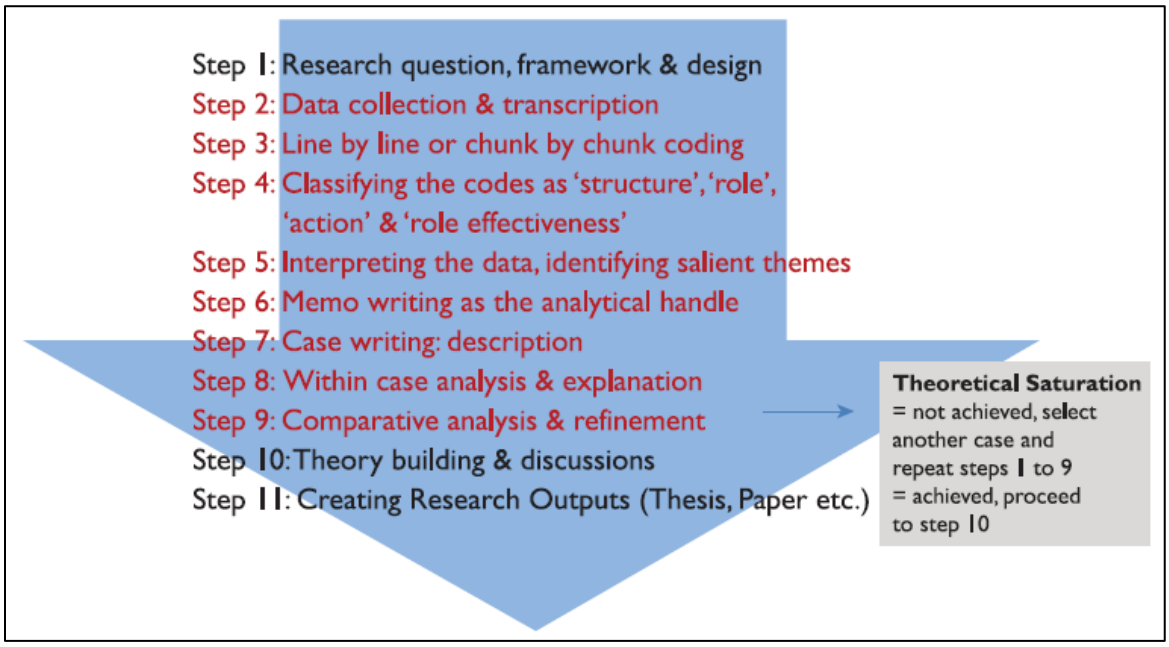
In the exploratory sequential method, the researcher will start with qualitative research to explore the views of all the relevant participants. This data will then be analysed and used as input into the quantitative phase of the research to confirm the initial findings.

Although it was the researcher's original intent to follow the exploratory sequential approach, the method was changed to a qualitative-only data collection approach. The 13 in-depth interviews on the organisation used for this case would have provided additional input into the research questionnaire. The questionnaire would solidify the work from Hidding and Nicholas (2014), and the original questionnaire was obtained from Hidding and Nicholas (2014). The researcher, however, found that the results from the qualitative interviews were significantly different to the questionnaire and that the original hypothesis and intentions to prove the theories of Hidding and Nicholas (2014) were in contradiction with the exploratory results. It was thus decided to focus purely on the exploratory nature of the discussions to eliminate any bias towards the original hypothesis and questionnaire.

4.2.4 Qualitative approach

"Qualitative research has at last achieved full respectability in the academic sphere, and the success of commercial qualitative market research is demonstrably substantial" (Bailey, 2014). This study used the 11-step approach, as reflected in Figure 4.2, of quantitative study design and focuses on the philosophy, method and operationalisation of the research proposition (Singh, 2015).

Figure 4.2: Eleven steps of theory building



4.3 Population and sampling

4.3.1 Population

There has been almost no research conducted on any emerging market implementations of the scale projected throughout this study. Although this specific study is isolated to one organisation, the lack of any other research of this nature in an emerging market quantifies the use hereof for any large information-driven project in an emerging market. This statement must be cautiously interpreted, though, and will have to be revised as research on this specific topic expands. The three definitions that follow are of integral importance considering the wide generalisation of the results of this study.

4.3.1.1 Large-scale project

This refers to any project with an implementation of more than three years. The total cost of such a project must be more than $100 million adjusted for inflation from 2015.

4.3.1.2 Emerging market

For purposes of this study, an emerging market is any country or market that was previously referred to as a “third world”. This definition is thus primarily attributed to the gross domestic product (GDP) per capita and the infrastructure availability within the country. An example of countries that comply with this definition at the time of this research are South Africa, India, Brazil, Russia and the rest of Africa. This definition excludes China because of its economic size, resources and technological capability to compete with large first-world countries

4.3.1.3 Information-driven project

The intent of this study was for the results to be applicable to any type of project that involves information. That means that it does not purely apply to IT implementations but can be used for any project that requires, uses or delivers large amounts of information.

4.3.2 Sampling and data collection methods

The sample used for the analysis was defined based on the stakeholder’s relationship to the project. Table 4.1 shows the relevant stakeholder groups that were included in the population sample. These stakeholder groups reflect the internal employee classification of the organisation that was used. Although originally the intent was to interview the same number of respondents across all the relevant groups, it became apparent in the informal pre-interviews that the interviews with technical staff and non-managerial employees would bear much less information. The researcher thus focused predominantly on executives and senior management interviews, as it was clear that most project knowledge and depth would come from these employee groups.

Table 4.1: Standard Bank employee classification

Employee Type	Definition	Employee Example
Executive Sponsor	An executive sponsor refers to the executives that are either directly involved in the implementation or have a vested interest in the successful implementation of the project	CIO, Program executive, Business sponsor, Technology relationship executive
Executive Non Sponsor	Non sponsor executives refer to the senior management team that is responsible for using the implemented program to derive value for the customer and the organisation	Head of Business Units, Head of strategy , Head of Products
Project Manager	The project manager and project management team refers to all employees that are involved in the planning and roll-out of the IS implementation. These individuals have direct control on the way the project is run and rolled out.	Project manager, project lead, Solution architect, Change manager
Line/ Operations manager	Line and operation mangers are all mangers that are involved in the day to day execution of the core business functions. This includes the physical branch (front office) and back office individuals	Marketing manager, branch manager, operations manager
Technical resource	Technical resources refer to all employees and contractors that are directly involved in the building, designing, testing and implementation of the project	Programmers, testers

4.3.2.1 Qualitative sample and method

For the qualitative analysis, a total of 15 stakeholders were identified and interviewed across the different stakeholder groups. This was a convenience non-probability sample-reliant on the availability of the relevant stakeholders (Saunders & Lewis, 2012). There are certain individuals that are absolutely integral to the study, for example, the chief information officer (CIO) and project sponsor, and thus, the choice to use a non-probability sample is well supported.

The interview method used by the researcher consisted of a two-phased approach. Phase one consisted of a round of informal interviews with core stakeholders to understand the environment and background as depicted in Chapter 1. The objective of these interviews was not to start analysis on the research propositions but to gain extended insight into the business and project landscape, to identify any additional literature to be included and to help select the most important individuals to include in the study. This phase of the research proved to be very fruitful, as the literature regarding risk management came to light during this process. It also assisted greatly with the selection of the correct executives and managers to interview, as the researcher was much more aware of the internal landscape and politics regarding the project. Phase two consisted of in-depth interviews with selected members in the organisation. Although, naturally, most interviews included project-specific executives, some candidates that did not form part of the project were also selected to ensure their perspective as a stakeholder was accounted for.

The interviews included the current chief information officer of the South African operations, the previous project leader and now chief information officer of the African operations, and the executive responsible for change management and business readiness. The interview also included an executive that left the organisation because of the perceived failure of the project in its later stages and the chief financial officer that was responsible for the finances of the organisation during this implementation. These five interviews alone provided a magnitude of depth and understanding regarding the project, as they were all seasoned executives that have been involved with the project since inception.

4.4 Data analysis

According to Saunders and Lewis (2012), there are three steps to analysing qualitative data. These three categories correspond with the aforementioned approach depicted in the 11-step design of a qualitative study (Singh, 2015). After interviews had been transcribed, categories of codes were developed (Step 1), the unit of analysis to which these codes will be applied was decided (Step 2), and the units of data were coded in a two-step approach (Step 3). First, informally and manually to identify large themes and then very detailed to extract inductive low-level codes and themes. Coding themes were assigned in accordance with the de jure conceptual framework Figure 3.1 developed by the researcher as well as any new themes from exploratory data gathering. A comparative analysis between the different stakeholders' responses was performed to further understand the different opinions in the organisation

regarding this programme. The results from the qualitative study were used to test the researcher's hypotheses and to derive the conceptual model regarding the different decision points and stakeholder actions that impact project success.

4.5 Research limitations and biases

This study has clear limitations in its sample population, as it only covers one specific organisation and should thus be cautiously used when the results are used in other countries and/or organisations. Guyatt *et al.* (2011) suggests including a risk of bias table to illustrate the transparency in the literature and to enhance the legitimacy of the study. Table 4.2 thus lists the potential biases that were identified before the interviews were conducted to try and mitigate the risk of a compromised study.

Table 4.2: Potential project and individual biases

Type of Bias	Why was this relevant to this research ?	Mitigating action
Subject Bias	The system implementation at the organisation used in this study is a very sensitive subject. Many executives has been dismissed because of this program and the more junior employees know that any negative comments regarding a release will not be tolerated. This was evident during all the interviews with non managerial staff.	The researcher provided the letter from the CEO to each and every respondent to guarantee that it would remain anonymous. This however proved to not always work and the interview schedule was adjusted to focus on management that would be prepared to give honest feedback
Subject error	The program just had just under gone a major setback and the responses of all the relevant interviewees could thus have been affected by this event	The research questions asked focused purely on the positive trying to ensure that no extra attention is given to the recent setbacks.
Confirmation Bias	The researcher has worked in this organisation for the past 6 years and has experienced some of the project results. There definitely exists a large probability of confirmation bias being present as the researcher aims to prove his pre-conceived hypothesis.	The researcher under guidance from his supervisor listed his pre-conceived hypothesis before the start of the literature review for this study. The main assumptions from the researcher before the study is listed as part of the limitations section of this study. This allowed the researcher to own his bias and evaluate the literature and the data collection more objectively.

The fact that the researcher spent more than 150 hours of reading on the topic while developing the proposed de jure model posed a risk that the interviews would be over guided to prove the findings of the study. To mitigate this potential bias in the data gathering, all interviews were conducted with a very specific approach to ensure they were as open-ended and exploratory as possible. This was done to first ensure that maximum benefit was obtained from the interviews but also to remove any biases and answer steering from the researcher. The approach consisted of a five-minute informal conversation, where the researcher stated his biases and explained to the participant that he or she would do almost all of the talking. Although a formal interview schedule was developed, it was not distributed before the interview and never disclosed to the participant to ensure absolute objectivity. During the formal interview, all questions were deliberately kept open-ended and only during the final few minutes were specific concerns or questions addressed.

4.5.1 Researcher's pre-study hypothesis

As mentioned in Table 4.2, the researcher under the guidance of his supervisor penned his original hypothesis and preconceived thoughts regarding the project in order to own his bias and to remain truly objective during the literature gathering and interview process of the study. These foregoing aspects are summarised below.

4.5.1.1 Involvement with the project

The researcher had been involved for a limited time on one of the releases of the project as a business sponsor. This specific release was particularly far over budget and schedule and thus created a preconceived view in relation to the project management skills in the project. This meant that the researcher started this research leaning towards the business' point of view concerning the "age-old us vs. them" debate between IT and business.

4.5.1.2 Preconceived views of reasons for failure

The researcher started this study with the hypothesis that the greatest reason for failure in a large-scale information system implementation is the type of project management (efficiency school of thought) method that was selected, i.e. Agile or Waterfall. The researcher further felt that the selected technology and the governance surrounding the architecture for this

technology played a major role in the outcome of the project and that a more flexible project management method would ensure success.

4.6 Conclusion

The research methodology used in this study has been explained from different dimensions. The research design and the research approaches were also elaborated. In the next chapter, an analysis of data will be presented.

Chapter 5: Data Analysis

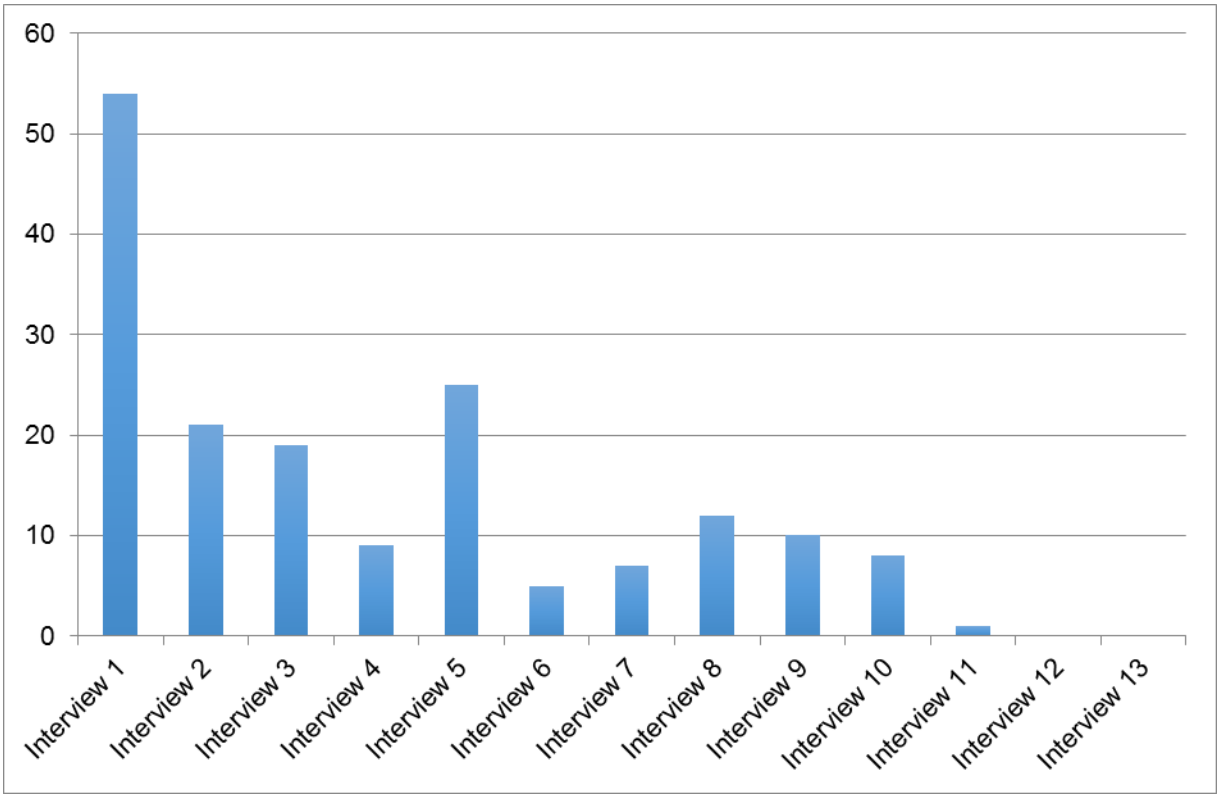
5.1 Analysis methodology

The 13 final interviews were deductively analysed in accordance with the literature regarding efficiency, effectiveness, stakeholder roles and risk management. Fereday and Muir-Cochrane (2006), however, suggests that the most effective way of ensuring rigour from a qualitative data analysis is to combine inductive (themes emerging from interview) and deductive (themes derived from the philosophical framework) analysis methods. Therefore, any themes or codes identified during the analysis were added and, subsequently, new literature regarding these themes was obtained. The unit of analysis used throughout this analysis is that of the organisation, as the interviews focused on the overall high-level outcome of a major project. Some interviews, however, did briefly focus on the role of the individual during the project, especially considering the role of the various stakeholders during the project implementation.

Two levels of coding were performed to ensure accurate, unbiased results were obtained from the data. First, a high-level mapping was done to identify possible themes by purely reading through all the transcribed interviews. This was a manual mapping and was purely done to refresh the memory of the researcher and to apply a first level of structure to the data. This high-level analysis was based on the themes deduced from the literature review and served as broad-based codes for the analysis. After this high-level manual mapping, an in-depth coding of all the data was performed with the assistance of an independent third party. This was done to ensure the many biases held by the researcher would not affect the outcome of the data analysis. The codes were grouped according to the high-level themes that were identified in the manual analysis.

A total of 171 low-level codes were identified during the in-depth coding of the interviewees. Interviews were coded in the order they were performed, and Figure 5.1 illustrates that saturation was reached after interview 11. No new codes were identified in interviews 12 and 13. The codes were grouped into 19 sub-groups/themes and ultimately summarised in accordance with the original research hypotheses. Each identified code was also substantiated by a quotation from an interviewee. Some of the most impactful quotations are listed in the next section on analysis.

Figure 5.1: Low-level code saturation



The final analysis is presented below according to the research questions identified in Chapter 3.

5.2 Data analysis

5.2.1 What effectiveness-related project inflection points and actions contributed to the overall outcome of the project?

5.2.1.1 The project sponsor/owner

"If we then go to success factors, first one and most important is senior executive ownership and accountability and this accounts most probably for 70% of the success factor" – Chief Information Officer

An immense amount of emphasis was given to the role of the project sponsor and/or project owner. Almost all the interviewees felt that a project of this nature had to be business-owned. Table 5.1 summarises some of the many quotations regarding the business vs. IT ownership

theme that came across very strongly. A very interesting observation was that both the IT and business executives and teams all agreed that projects of this nature should be owned by a business sponsor. There was, however, a great disconnect of who actually owned the system in this specific case. Business users kept mentioning that IT owned the project and that this was the core reason for failure. The IT representatives, however, felt that business took over the ownership when the chief executive officer became the project sponsor.

Table 5.1: Project ownership-themed quotations

Stakeholder group	Quotation1	Quotation2	Quotation3	Quotation4
Executive Sponsor Business	"It was still very much IT driven and especially the project I did was migration" ;	"Initially started as an IT Driven system replacement in 2006"	That's why I said you have to know why you are doing it and the business case wasn't clear	"Early stages already pointed out you cannot have an IT driven project, because business was intimately involved in it. "
Executive Non Sponsor Business	"Now the business sponsorship was not that visible. "	"The methodology in itself initially was fraud, we quickly found out, because what he said , you don't have the same requirement in different streams across Business and IT"	"So they come up with tactical solutions, IT was driving it, in my view it was a purely IT driven project at that point of time"	
Executive Sponsor IT	The most important decision we made was to say that the CEO of the retail banker must sponsor this program	"There was not a specific accountable business owner for the program at that stage it was committee based"	"And as it moved those committee roles moved on as people changed, so nobody's let's call it neck was on the… or head was on the block"	"...we separated the system…and both those individuals had separate mandates"
Project Manager and project team	So we expected directions from business..	And the journey route was not designed by business at that point in time in my view. And we had to come up with solutions....	"...you try and get 20 execs in Standard Bank to be on the same thing and it is impossible"	

Senior executives on both the business and IT side agreed that the chief executive officer should be the overall sponsor. They also felt very strongly against a project that is owned by a committee, as this leads to a lack of responsibility. It was further also found that a consistent, single accountable owner was deemed a necessity, as sponsorship changes just lead to confusion and slower delivery.

Throughout most of the interviews, there was a fair amount of conflict between the business and the IT representation. This is especially true for the most senior executives that took part in this research. As previously mentioned, these groups do, however, concur that ownership should sit with a business sponsor. Most disagreements, however, came when prompted about who the actual owners were in this study. There is thus a clear need to clearly articulate who has this mandate. A change in ownership seemed to be the factor that caused this confusion, as the sponsorship moved between business and IT regularly at a lower executive level.

5.2.1.2 Role of a skilled governance board as a key stakeholder

Project governance is regularly referenced as part of project management principles. The data, however, showed a clear emphasis not on the process of governance but on the role of a governance board as a stakeholder to the project. Table 5.2 shows clear differences in the opinion regarding the governance board in this specific case. Business often felt that although governance forums are very strict, they were very ineffective. This seems to be due to a board and governance forum that does not have the expertise to make the correct decisions regarding the project.

The addition of an external independent, experienced governance/project board seemed to significantly improve the perceived effectiveness of project delivery. Skilled consultants with previous experience in a similar project helped speed up decision-making and delivery substantially. The governance board is further perceived as a key stakeholder regarding conflict management, in particular, between the business owners and IT delivery teams. This is why the respondents in this study felt that the governance board should remain independent. Some respondents went as far as quoting that leadership could not challenge the governance board.

"Now, they didn't have the courage to challenge the chief executive officer, that is why that IT system was just like sitting there and nobody was getting any traction" – Executive Business Sponsor

This fear of choosing the right side between business and IT seemed to have had a significant impact on the delivery of the project. A quotation from the executive change manager below further emphasises the competition between the relevant executives and the need for independence. *"It was almost like there was competition as to who speaks to the chief executive officer first"* – Change Executive

A final interesting finding was the continuous mention of research and learning from external non-competing organisations that went through a similar programme. These external parties regularly helped to simplify decisions and inflection points and could form part of the overall governance board as a key stakeholder to the effective delivery.

Table 5.2: Governance-themed quotations

Stakeholder group	Quotation1	Quotation2	Quotation3	Quotation4
Executive Sponsor Business	"I would say it is under-governed and not over-governed. Coming from business, you always get irritated with governance. The people that were governing things didn't know what we were asking because they didn't have skills"	"So the Governance process was very owneress from that perspective"	"...that had to go to three governance forums to get approval"	"Sitting in those governance forums , for a year, there was often a long debate, unnecessary debates , and blaming, business blaming IT, IT blaming blaming SAP , because there was not clear accountabilities and clear allignments as to who is responsible for what. "
Executive Non Sponsor Business	"Every week we had a governance forum every single week for a few hours , and we could never get through the agenda."	"He [external consultant] helped us with a lot of immediately, if you put something on the table, he would ask you, what is the scale of this problem. "		
Executive Sponsor IT	"We also introduced, independent external assurance partner ….. It is an important element of success."	"The governance really worked for us. "	"Through this journey we engaged regularly with other banks, and that has also helped us	
Project Manager and project team	"I think sometimes these executives and these business guys actually don't know how program delivery works, they don't understand the complications"			

5.2.1.3 Project outcomes and scope identification

The project's intended outcome and scope was one of the themes that came out very strongly during the analysis of the interviews. The project business case seemed to have been rewritten almost every year for the duration of the project. Table 5.3 illustrates some of the most relevant quotations regarding the shift in perceived outcome.

The words "silver bullet" were mentioned on numerous occasions and summarise the overestimation of benefits very well. Business teams that got involved post the change in sponsorship seemed to have neglected all other plans and sources of income. The transformation project had thus moved from a systems replacement to a revenue-generating

business project. Several references were also made regarding retrofitting business cases from cost reduction system replacement to revenue-generating transformations. These inconsistencies and continuous changing of requirements and perceived outcome resulted in massive delays in delivery, re-scoping and conflict. Business case “validation” was also a theme that came up regularly, as new members to the project were expected to generate value from the massive investment. Some references were made regarding the unlikelihood of in-project benefits extraction. Most interviewees felt that the only direct project benefit of a system replacement was the increased efficiency and thus possible reduction in cost.

Perceived project outcome was identified as a core theme that needs to be properly defined and scoped before a project is started. Several interviewees also mentioned pre-project planning or proof of concepts as ways of determining the correct required outcome before a project is started.

Table 5.3: Outcome-themed quotations

Stakeholder group	Quotation1	Quotation2	Quotation3	Quotation4	Quotation5
Executive Sponsor Business	"it started off as a system replacement and then morphed into a transform process where we can change everything"	"plan B and C was never really considered because everything was going to be delivered"	"where it was still the silver bullet for personal markets"		
Executive Non Sponsor Business	"So whether the commercial benefit means…talking about the efficiencies and the cost we are going to save"	" I think even, even about 3 years post the business sponsorship there was a point where we've said uhm the benefits are not justifying us continuing with the project"	" Because that means you can generate more revenue and that's where it came from."		
Executive Sponsor IT	“One of the big challenges we found through the journey over the last ten years was that your business rationale shifts.”-	“So I think the logic is if you decide on scope, agree that scope do not fiddle with it.”	"It meant in order to invalidate the business case we needed to do all the work to actually...say this is the real number."	"The business case is dynamic, but I think you need to use the business case as a true north"	“If you try and extract to much short term benefits out of a large complex program you may be disappointed”
Project Manager and project team	"People have this delusions and dreams of grandeur, and they are waiting for this silver bullet to land."	"But they were quite adamant that they drive both the revenue lift and a cost decrease "	"Apparently it became a situation where it will say you will start realizing the benefits only when you finished with the journey "	“So many of the other banks that have done this had a program before they started the core banking, which is rationalization of existing application landscape.	

5.2.1.4 Measurement

The measurement and metrics of a project were identified as a major theme across most of the interviews. Table 5.4 shows some of the most important quotations regarding measurement and metrics.

Table 5.4: Measurement-themed quotations

Stakeholder group	Quotation1	Quotation2	Quotation3	Quotation4
Executive Sponsor Business				
Executive Non Sponsor Business	" trying to firugre out what the operations efficiencies potentially can be and that's where some of the measurement issues come into play"	"There is only one way to measure adoption you must show with data that these people are using this new system	"The first thing that is actually de-scoped is actually reporting and measurement in, in the project space mainly because they don't understand it."	I think we should be measuring the business...currently that's not really how it is done, we measure the project
Executive Sponsor IT	"Overtime we have found the overhead associate with complex metrics and measurement was too big and what was better is less metrics, but more accurate metrics."	"If your baseline keeps on moving it is very difficult at any given time to have credible metrics, because you don't have a baseline that you can measure against you cost and schedule."	The second thing we've experimented with is extensively is measurement and metric on the program.	
Project Manager and project team	"With [the project] being the capitalized project we couldn't measure the outcome on a yearly basis."	"So really we couldn't measure anything from a business side."	"because my measurement is whether I get the project in, not whether it is going to add value "	

A few very interesting observations can be made from the Table 5.4. First, no significant quotations were made regarding the measurement of the project by any of the interviewees that are classified as executive sponsors. This group of stakeholders never got into any depth regarding the project metrics even after the continuous probing by the researcher. A second interesting observation is the contrast in the measurement and the perceived outcomes discussed earlier. It was stated by most participants that business value/benefit measurement was not possible or implemented across any areas of the project. Measurement was purely based on efficiencies regarding the time and effort spent to implement.

The head of measurement and metrics for the entire organisation was interviewed for this study. His comments are probably the most profound of all. He mentioned that the measurement team was not involved in the project at all. He also stated that the reporting and measurement were the first things de-scoped from the project. The interview with this particular executive only lasted 18 minutes, as it was clear that he had no understanding or insight regarding the project. This in itself is an extremely interesting insight, as the project used for this case study is perceived not only as the biggest cost contributor but also as the biggest benefit driver of the organisation.

It seems that no measurement of the effectiveness of the project in this study was being tracked due to the perceived complexity and lack of involvement of the measurement team. It is thus safe to say that the project flew blind when it came to effectiveness measurement. There was, however, mention made of very sophisticated project/efficiency measurement.

5.2.1.5 Technology selection

The theme regarding the selected technology partner and platform was one that also resulted in some interesting observations. Table 5.5 reveals that the project management team and all the other technical project resources did not mention the choice of technology as a potential success factor. These stakeholders worked with the platform on a daily basis, and their perception of the technology was always reasonably good. The only point mentioned by this stakeholder group was that a more generic “vanilla” version of the technology should have been used. They also indicated that the technology should have informed the way business processes should run.

The above views from the project-specific stakeholders are in direct contrast with the themes from the business and IT executives. These stakeholders had strong opposing views regarding the selected technology type and partner. They felt that the choice of technology ultimately limited what could be done and that it played a significant part in the overall successful implementation of the project.

Choosing the correct technology that is fit for purpose is thus a very important task during the planning phase of any project. It is also of equal importance to ensure that the project team and business are aligned regarding the chosen technology. If this is not managed well, the overall

effectiveness of the project deliverable will not be perceived as favourable by the business sponsor.

Table 5.5: Technology selection-themed quotations

Stakeholder group	Quotation1	Quotation2	Quotation3
Executive Sponsor Business	"...first error that you could see, you picked the wrong system"	"So, they pick a system that is not mature as well for the financial services"	"The system that was picked as well was not the best system"
Executive Non Sponsor Business	"...but the reality is even that was not good enough because we, we could have chosen a cheaper version of a banking platform"		
Executive Sponsor IT	"For me I think we are paying a lot of school fees for future users"	"We didn't realize that we are going to replace a front end CRA capability"	"...the only discretion we had the only discretion we had was around how we execute, but the technology choice, software, hardware, integration patterns and systems was all done, chosen, made. "
Project Manager and project team			

5.2.2 What efficiency (project management) project actions contributed to the overall outcome of the project?

5.2.2.1 Project methodology

One of the most spoken about themes during all the interviews regarding project efficiencies was a concept called “Schedule is King”. This term referred to a specific project management methodology and was implemented in the organisation after the first project reset. Schedule is King is a trade-off methodology between three project variables, namely, (1) project time, (2) project scope, and (3) project budget. The term Schedule is King refers to a right-to-left project management style where the time of implementation is fixed. This means that the budget and/or the scope can be changed as long as the time of delivery is met.

During most of the interviews, the IT teams and executives highlighted that the right-to-left methodology explained above was one of the core success factors. Table 5.6 illustrates some of the most influential quotations regarding this concept. It is however very important to mention the contrasting views of businesses that believe that a left-to-right approach that guarantees the original scope and benefit is the correct project delivery approach.

Table 5.6: Project methodology-themed quotations

Stakeholder group	Quotation1	Quotation2	Quotation3
Executive Sponsor Business	"That was the only focus and IT's mandate was actually the quickest way to get this thing delivered"		
Executive Non Sponsor Business	"…[Schedule is King]definitely had an impact because we went from a silver bullet to a system replacement , due to that. "		
Executive Sponsor IT	Schedule is King is obviously you have to stop other work. "	"let the efficiencies and the effectiveness be done with in the time constraint.	"planning initially was right to left, and this is, this is often on these programs a success factor, so you decide what date you are going to complete. "
Project Manager and project team	"So that's why I say the whole thing this whole schedule is king and to get the, keep the momentum you just stick to those dates, and it is like ripping off the band aid, you can't let this thing carry on and carry on. "	"We adopted a logo called the scheduling king and it was the CEO which is the business guys, approached to saying you know what you are never going to get this thing perfect get it in"	

Very little mention was made of the traditional project management types such as the Waterfall or Agile methodologies. The non-business sponsor executives were the only group that mentioned the Agile project management approach as a potential success factor. They felt very strongly about the speed of execution and flexibility aspects of managing a programme. One senior IT executive briefly mentioned the trade-off between Waterfall and Agile, but he did not feel that it had a significant impact on the overall success of the project.

5.2.2.2 Skills

A strong theme among almost all the stakeholders was that of lack of the correct level of skills during the project. Table 5.7 summarises the most notable quotes regarding the lack of skills on the project.

Table 5.7: Skills-themed quotations

Stakeholder group	Quotation1	Quotation2	Quotation3	Quotation4
Executive Sponsor Business	"They didn't understand the skill set that they needed, not from top, we identified and said the top was wrong, the programmers that they have, they didn't have the best BA's they didn't have the best programmers and that is the problem with South Africa."			
Executive Non Sponsor Business	"An entire IT team, that did not work on core banking before, the entire team, the program managers, the project managers, the BA's and that they did pointed out as a risk on the journey"	"We have used many consultants"	"..we had to rely on consultants and most of those skills were imported."	
Executive Sponsor IT	"You can imagine to staff a million mandate programs out of the South African market is extremely difficult and in fact we came to the realization we cannot staff it from South Africa only."	"If you want 50-business analyst out of the market it is one thing, but if you go out of the market and you want 250 competent people at a reasonable hourly rate it is nearly impossible.	"So you need to build those skills so it actually increases the cost of the journey. "	"We don't have the pre-requisite skills to actually execute this journey and it is not unique"
Project Manager and project team	"A very important dimension has been access to skills."	"Technically a very tough journey and more and more we had to rely on third parties to actually augment and to support a team that ended up being x1200 people on a program. "		

There is no single stakeholder that was interviewed that felt the level of skills in this programme was of sufficient quality. Many references were made regarding the use of expensive third-party consultants and the impact this had on the overall cost of the project. The need to understand and manage one's skilled resources during the implementation of any large project deliverable is thus a key efficiency factor.

5.2.2.3 Location

Probably the most astonishing theme that was found during the analysis process was the importance of a central physical project location. IT executives, sponsors and project teams all agreed that those making up a project team had to be located as close to one other as possible. This theme came out in multiple discussions and even includes previous projects that the

stakeholders were involved in. Special emphasis on senior leadership and business involvement was made, as interviewees felt all participating parties should be located together for the duration of the project. This includes sponsors and senior executives. Table 5.8 summarises the most important quotations in this regard.

Table 5.8: Location-themed quotations

Stakeholder group	Quotation1	Quotation2	Quotation3
Executive Sponsor Business			
Executive Non Sponsor Business			
Executive Sponsor IT	"Because of our language, culture, distance and if you don't all sit in the same building you can easily misunderstand each other "	"the sponsors of the releases hardly ever saw the teams"	"just because in an organization with lots matrix structers it is very difficult to get delivery focus up if people work in different environments".
Project Manager and project team	After about a year they found out the guys would not talk to each other anymore. Because you sit in separate places , if you are not constantly engaging and business is not part of and they even alienate their own business people	"... it is very difficult to get delivery focus up if people work in different environments. "	

5.2.2.4 Direct and consistent business involvement

Business involvement during the delivery phases of the project was a theme that continuously got mentioned during the interviews. It was especially dominant from the IT stakeholders who felt that dedicated business resources should be allocated for the entire duration of the project. Business stakeholders agreed with this sentiment but were less likely to take responsibility for delivery within an IT project. Table 5.9 illustrates the most relevant quotes regarding continuous business involvement during the implementation of a project.

Table 5.9: Business involvement-themed quotations

Stakeholder group	Quotation1	Quotation2	Quotation3
Executive Sponsor Business	"But when you went down into the actual business where the actual work was being done...Now the business sponsorship was not that visible"	"If IT says you didn't have enough business involvement then you need to explain why you d-scoped everything, from business. "	
Executive Non Sponsor Business	"And then we said here is where we see these being transformed. And then over a period of time we started running programs, or participate in the core banking journey to do that."	Unless you are personally involved ...and they can see the benefit.	
Executive Sponsor IT	"project manager and a business analyst are required for procedures to be made, **directions are to be given by business**"	"You actually need business embedded in the program"	"You need people that understand the product, that understand the product rules, can make decisions, can make the trade off and say this functionality is legacy"
Project Manager and project team	"Certainly we started to deliver more and more and there was more business involvement."	I think we should need to up those [business involvement] numbers as well.	

5.2.3 Why are projects not terminated during the original review phases when cost and schedule were clearly overrun?

The question regarding project termination was specifically asked in each interview with the aim of assessing the difference in responses from sponsors and non-biased executives and managers. Most respondents completely avoided these questions or refused to answer. This was clearly a very sensitive subject. Two executive sponsors and two IT executive sponsors did, however, make significant reference to the topic. Their most striking comments are listed in Table 5.10. It seemed that the commitment to market investors was the single biggest reason why the project was never terminated regardless of its progress. Respondents mentioned that although they tried to abort the programme after initial delays and escalating costs, the option

was not viable according to the board. The institution was expected to realise significant business benefits from the programme that was already committed and priced in by the market based on premature communications during the planning phase.

Table 5.10: Project termination-themed quotations

Stakeholder group	Quotation1	Quotation2
Executive Sponsor Business	"...in those instances we were forced to just continue with the journey and that was driven mainly by external factors in terms of what you committed to the market."	"we did try going to the board to say let's write off this asset and cut our losses and move on. "
Executive Non Sponsor Business		
Executive Sponsor IT	“I think the biggest risk that you run is, if you run a large IT program if you are not brutally honest”	“analyst starts asking, started asking us obviously a big hard question to say you have spend 3 and a half billion”
Project Manager and project team		

5.2.4 What attributes and events significantly increase the risk of project on-time and on-schedule delivery?

For this analysis, project risk is defined as the probability of cost and/or the schedule of the project to overrun its estimated budgeted value or the outcome of the project to be significantly different than originally expected. An increase in project risk thus illustrates a higher probability of a project to be deemed unsuccessful as measured by cost, time and scope. The research suggested that there is a minimum unavoidable amount of project risk that is present in any project regardless of its size or impact. This is dependent on organisation-specific processes and efficiencies. The risk-themed discussions were not part of the original interview schedule

but were brought up by very experienced senior executives. Very rich in-depth discussions were held regarding specific project risks with certain individuals. Although some themes were only mentioned by a few individuals, the intensity and time consumed by some of these inductive findings warranted an in-depth representation of the individual findings.

5.2.4.1 Project size

"Why is it risky? It is risky because of its sheer magnitude. In our case, we are talking about a more than a million man-days of effort." – Chief Information Officer

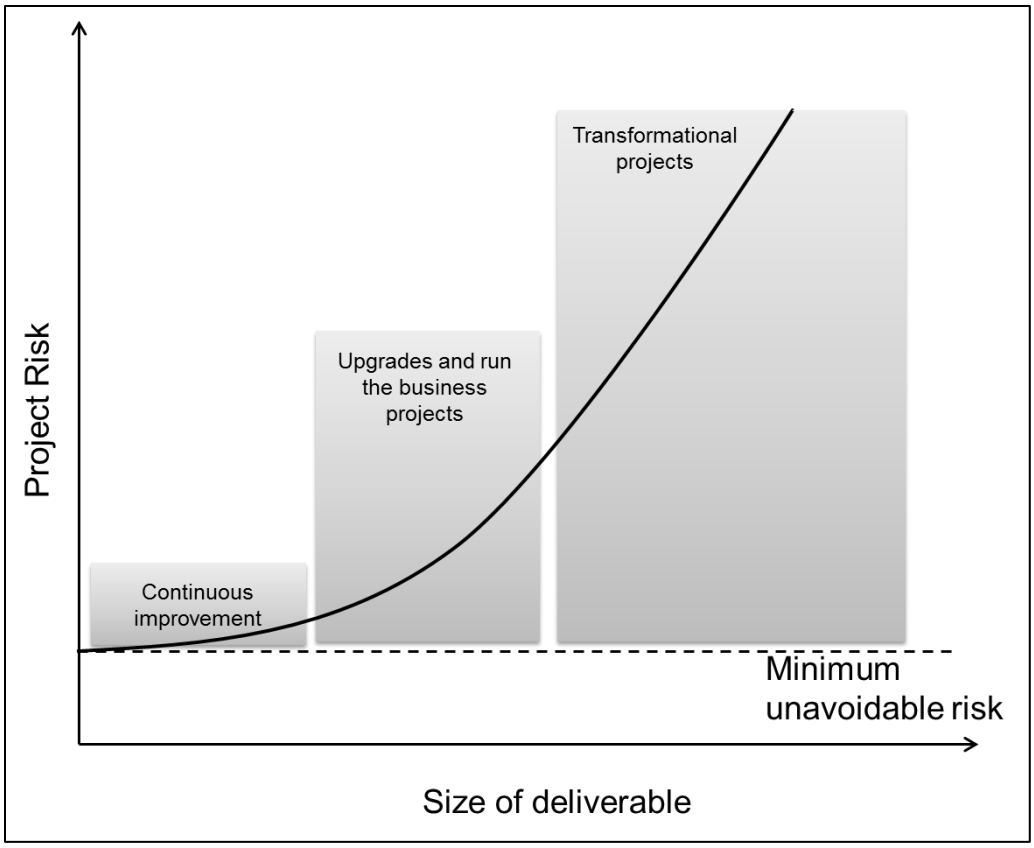
Project size is one of the key risk variables identified by stakeholders, as it increases the risk of delivery exponentially as the scope/size increases. Stakeholders from operations, information technology and strategy agreed that the size of a project in itself creates exponential project risk. Figure 5.2 illustrates the relationship between specific project risk and project size. Project size can be categorised into three core types, namely, (1) continuous improvement, (2) upgrades/run the business improvements, and (3) transformational projects.

"A big IT transformation is very risky; it's very costly and it takes a long time." – IT Change Executive

Transformational projects that change the core business of an organisation pose the biggest risk. Transformational projects are deemed to increase cost significantly, as they usually take a long time to finish. They often entail a change to the core of the business that significantly impacts the way a business functions. They also more often than not are performed in flight while the day-to-day business needs to continue.

"Because you are changing the proverbial bowings engines in mid-flight, you can't land, change the engines and then take off again." – IT Change Executive

Figure 5.2: The impact of project size on project risk



5.2.4.2 Change of sponsor

"Sponsor should ideally be in place for the duration of the programme; I think if you have that, there is no doubt that your overall risk of implementation drops dramatically." – Chief Information Officer

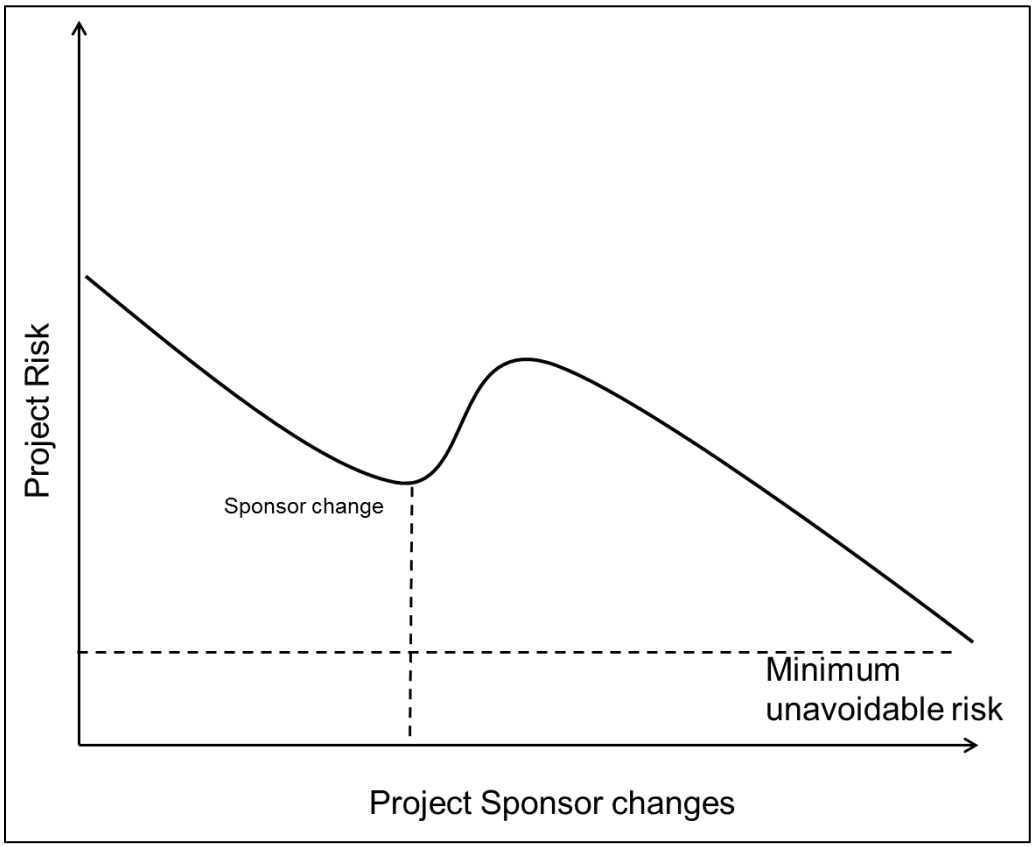
The role and importance of the project sponsor have been covered in depth already, but it yet again surfaced as a material risk that needs to be managed. A senior IT executive was quoted as saying the following regarding the choice of sponsor:

"If you get the chief executive officer as a sponsor, you de-risk the programme dramatically" – Project Executive

This is a common theme throughout all the interviews, as most stakeholders concur that the chief executive officer must inevitably own a large transformational programme. An interesting observation, however, that came out of various interviews was that the change in sponsor

increased the overall project risk by a significant margin. Senior programme executives, in particular, felt that although the project risk initially declined when the chief executive officer became the sponsor, it significantly increased when a new chief executive officer was announced during the project's execution. Figure 5.3 graphically depicts the relationship between a sponsor change and project risk.

Figure 5.3: The impact of a sponsor change on project risk



5.2.4.3 Team size

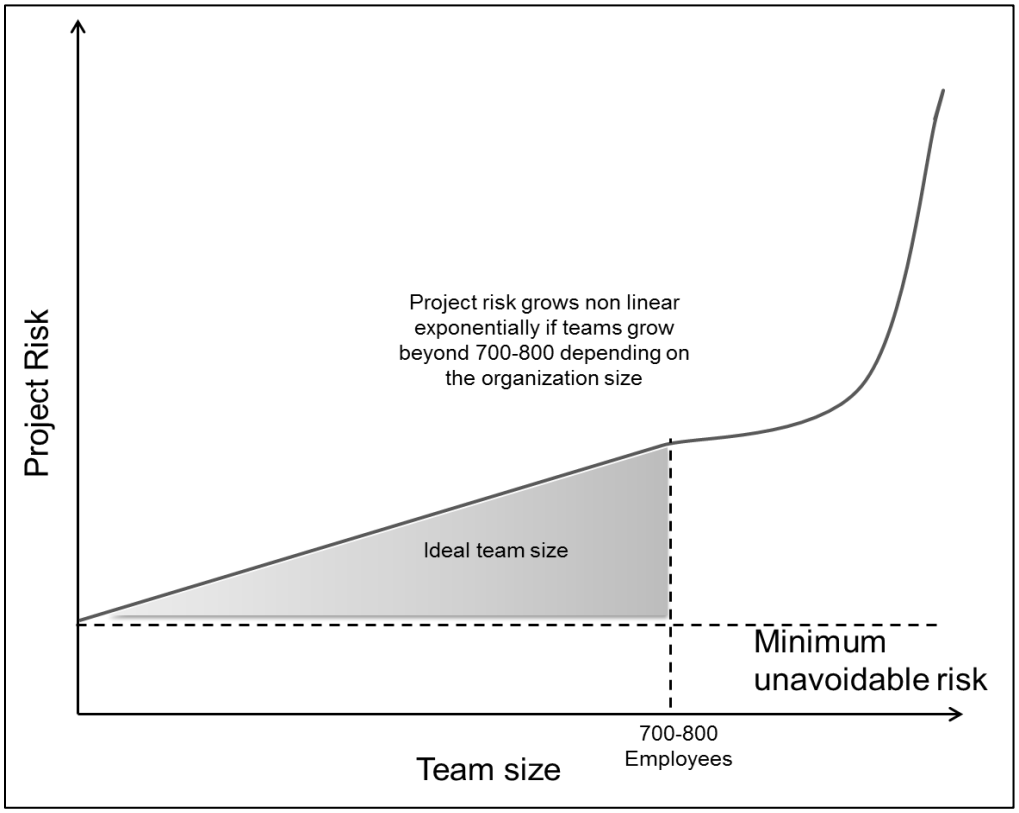
"Let's say on the y-axis you got risk and on the horizontal axis you have a number of people. Call it execution risk and number of people. It is linear up to a point, then it breaks out as non-linear. The moment you get to that point, your execution risk all of a sudden exponentially jumps up." – Chief Information Officer

To manage a team responsible for a large implementation is a very difficult task, as it continuously increases and compromises time and schedule pressures. Most interviewees felt that the only way to ensure on-time delivery after any setback was to increase the size of the

team. This naturally increased the cost of the overall programme significantly, as the burn rate per man hour goes up. There is, however, a mutual perspective among the project managers and business stakeholders that a team that becomes too big actually reduces efficiency. A diminishing rate of return is thus experienced on overall project delivery, while the cost of the project continues to increase. This leads to the majority of the interviewees being pro headcount reduction, as it simplifies the very complex process of managing large teams in a matrix organisation.

The size of a team responsible for the delivery of a project will always increase the complexity of a project as it gets larger. This is due to the increased strain on managers to steer the team and perform administrative management tasks. Figure 5.4, however, shows the interviewees' shared sentiment that the risk exponentially increases after a certain point. This is the same point that diminishing returns on efficiency are experienced. In this specific case, the number seemed to be between 700 and 800 people.

Figure 5.4: The impact of team size on project risk



Business stakeholders and executives concurred with the assumption of their IT counterpart and felt that the size, especially of the business analyst teams, made it impossible to move forward, as they continuously changed or rotated during the programme.

5.2.4.4 Risk of large legacy systems

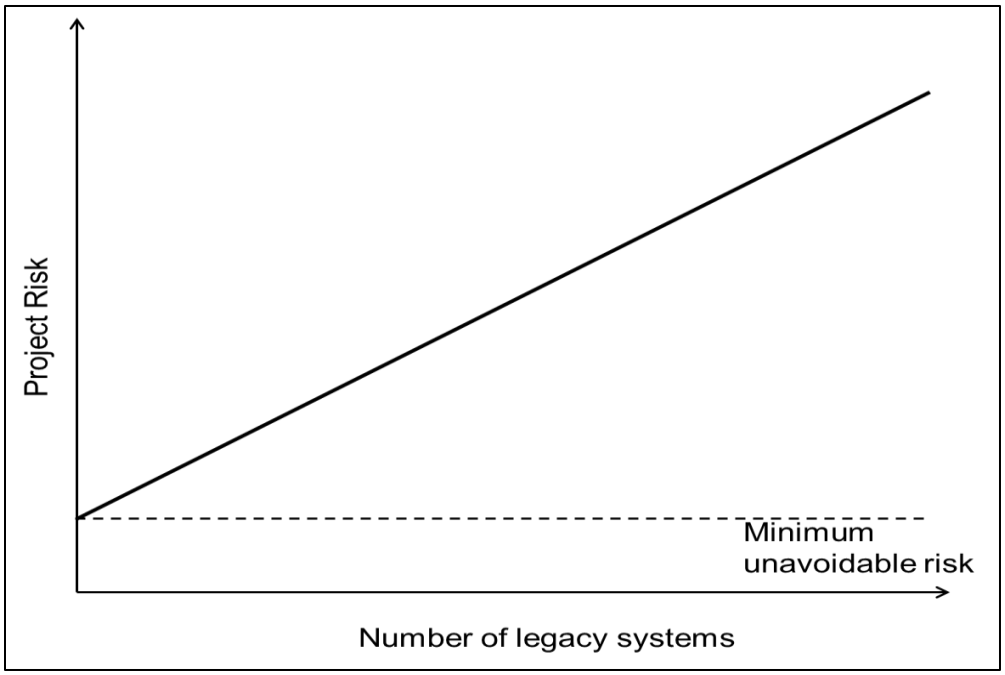
"This Bank is far more complex than any other bank that have done core banking transformations because of our legacy systems." – IT Delivery Executive

A common theme among all the executives and managers interviewed in this study was the impact of legacy systems on the outcome of the project. It is the opinion of the interviewees that the more legacy systems involved in the project, the higher the risk of failure. The project in this specific case study had more than double the amount of legacy systems that needed integration than the company with the second most dependable systems. It was further estimated that between 60% and 70% of the total effort and cost of the project was purely driven by the integration of legacy systems. In a different financial institution where the implementation of a similar magnitude and technology was successfully completed, the number of legacy systems for integration was only one-fifth of the size of that in the case researched.

Although the majority of the stakeholders are in agreement with the above statements, there is no clear consensus on the exact number of legacy systems and/or integration points where the risk outweighs the possible benefit of delivering the project. Most respondents did, however, feel that the specific organisation, in this case, required more legacy integration than the average project would need.

There is unanimous support that the less legacy dependencies and systems an organisation has, the lower the risk of project failure becomes. Legacy migration or discontinuity before the commencement of a large-scale project was a possible risk mitigation factor mentioned in interviews with delivery executives. Mention was made of the original purpose of the project, i.e. being a system replacement, and that the project mandate and, more importantly, measurement of success and benefits should have had this as a focal point for delivery.

Figure 5.5: The impact of legacy system complexity on project risk



5.2.4.5 Project time and its impact on project risk

"Do it as quick as possible and get out of it." – IT Change Executive

Another significant variable that affects the quantum of the risk associated with a project is the total time of the project. Although it is intuitively true that shorter projects hold less risk due to their complexity, it is quite different when it comes to large transformational programmes.

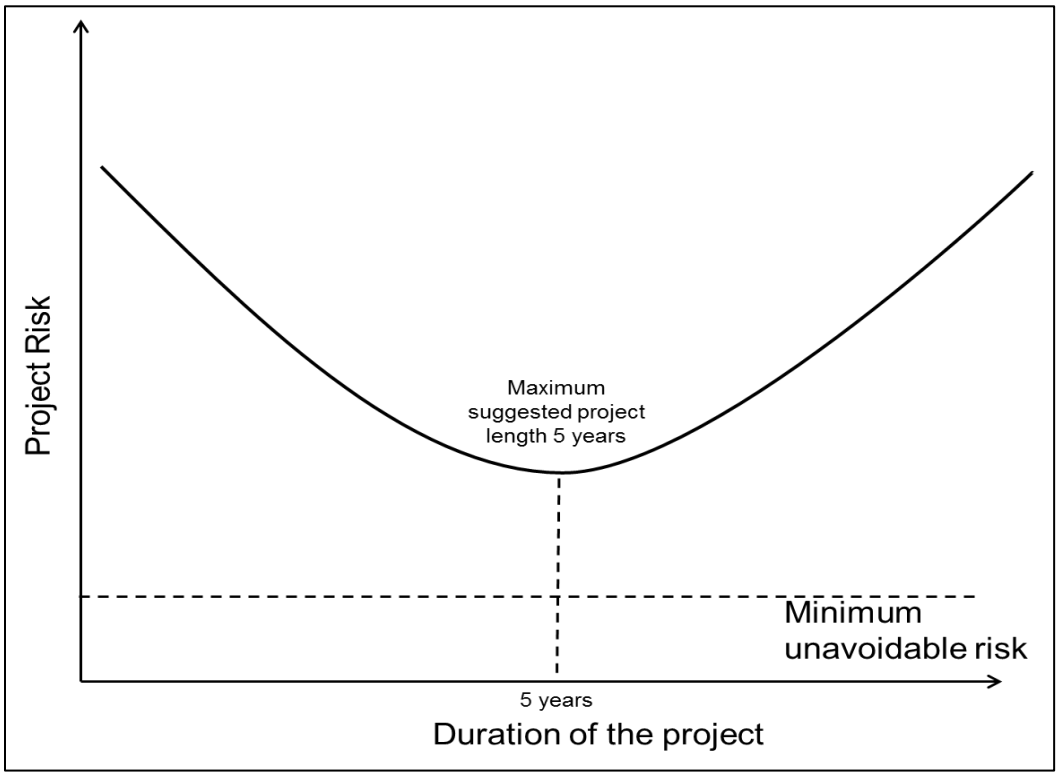
"It is a temporary thing; you can sustain it for four to five years max." – IT Delivery Executive

This senior IT executive above shared the sentiment regarding the time of the project. He further added that an organisation's appetite for a project can only span up to five years before it becomes business as usual. This, according to him, is a dangerous factor as intensity, focus and control significantly drops.

Figure 5.6 highlights the relationship between the duration of a large project and the project risk as depicted by numerous banking executives in the study. They believe that a large programme inherently starts with a massive amount of risk due to the size and uncertainty of the deliverable. This risk then gradually declines as the project progresses towards its conclusion. All the

stakeholders that mentioned the duration of a project as a risk, however, agreed that when a project extends longer than five years, the risk starts exponentially increasing again. This includes both projects that were planned for a duration of more than five years as well as projects where the estimation increased because of original setbacks. Most of the executives argued that smaller sub-projects would significantly mitigate the risk of project failure.

Figure 5.6: The impact of project duration on the risk of delivery



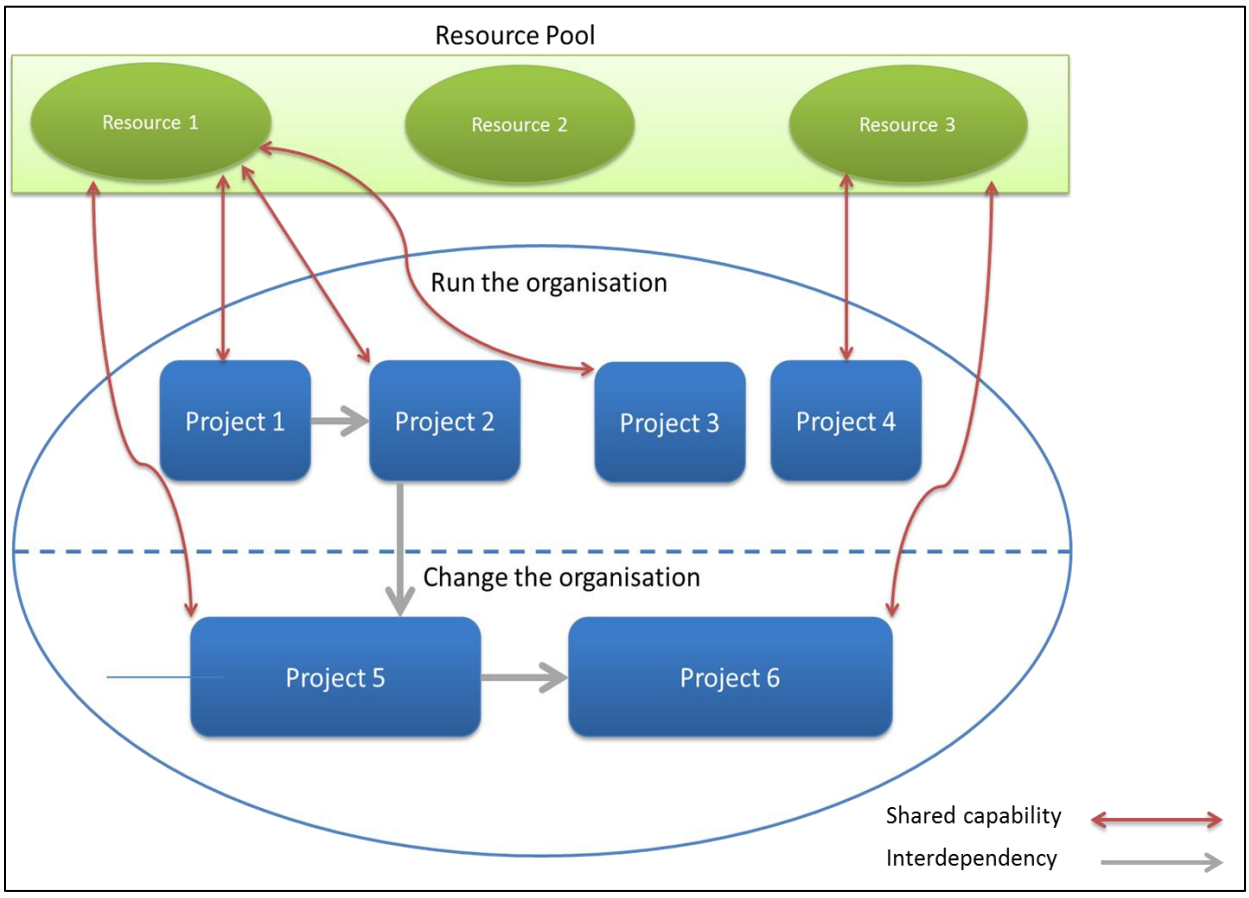
5.2.4.6 Project portfolio risk

"So when you threw the first Domino over you though okay we've dealt that one, but it beats all the other Dominos left to right." – IT Delivery Executive

The final risk factor that was mentioned by the respondents was the impact other programmes had on the delivery of the project in this case and vice versa. The aforementioned quote perfectly summarises the sentiment from the programme and delivery executives who felt that any project should not be managed as an island in isolation. Initial delays and dependencies on resources or other projects significantly increase the risk of overall delivery. Technical resources

were not dedicated to the project and were often required to ensure system stability. The knock-on effect of such a delay was devastating, and most stakeholders felt that it was a risk that was not well managed in the specific case. Mention was made of a project portfolio and the need to manage the project ecosystem, resources required and shared, as well as the interdependencies between individual projects. Figure 5.7 demonstrates a typical project ecosystem as extracted from the interactions with the respondents. The risk of a complex project ecosystem with many shared resources and interdependencies is extremely high and should be formally managed as a portfolio of risk. This entails that all the risk factors previously mentioned should also be assessed in terms of the total project portfolio.

Figure 5.7: Project ecosystem

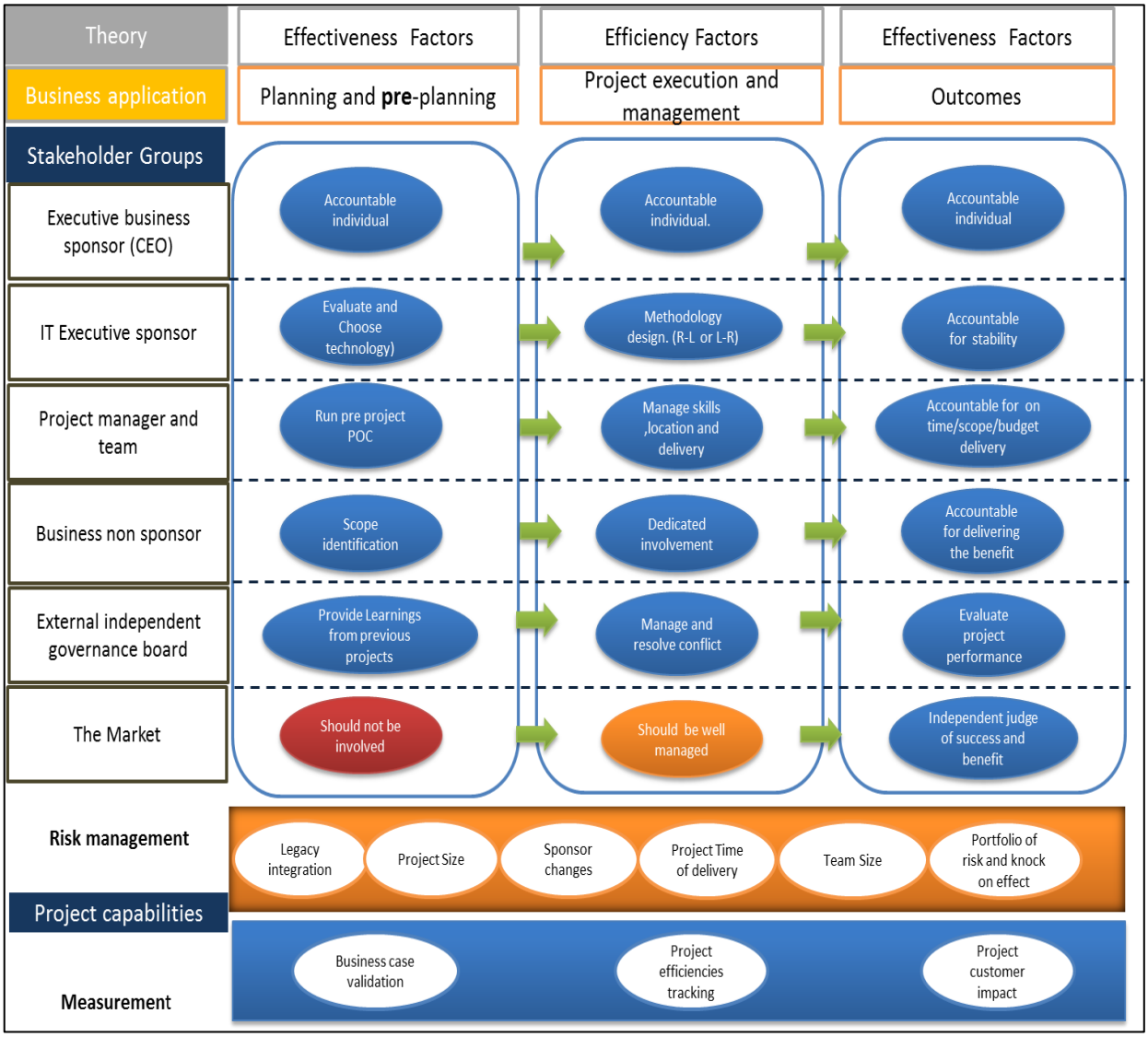


Chapter 6: Findings

6.1 Conceptual model for project success

The findings from this study and answers to the research questions posed in Chapter 3 are presented in a high-level conceptual framework in Figure 6.1 describing key project success tasks and the stakeholders responsible for their execution. The tasks depicted in Figure 6.1 are high-level conceptual tasks that should be broken down into specific deliverables when executing a transformational system implementation.

Figure 6.1: A high-level conceptual task framework for project success



6.2 Project phases and the interplay between them

As indicated in Chapter 2, previous research suggests two main schools of thought regarding the success of major information system implementations (Hidding & Nicholas, 2014). These can be categorised into (1) effectiveness and (2) efficiency schools of thought (Drucker, 1967). In this study, it was found that these two categories of success are not mutually exclusive opposing views but rather phases in the overall delivery of a project. Interviewees discussed many different aspects of project success in the case study that span across both schools of thought.

This study proposes a sequencing of the phases that can be seen in Figure 6.1. This sequencing suggests that any project starts predominantly with effectiveness tasks during the planning and pre-planning stages of a project. In this phase, the effectiveness tasks and actions are the most crucial to the outcome of the project as stakeholders scope the programme. After the planning phase, a project enters the execution phase. During this phase, the most important factors to consider for project success all form part of the efficiency school of thought as can be seen in Figure 6.1. The final phase once again returns to the effectiveness school of thought and focuses on the project outcomes and benefits. This includes project measurement at all levels and for all stakeholders involved. This sequencing of the two major project phases is a key finding in the study and forms the backbone of the conceptual model for project success.

6.3 Effectiveness-related factors and their effect on the overall outcome of a project

6.3.1 Stakeholder groups and their core project success actions

Project success is not the sole responsibility of the project management team (Cooke-Davies, 2002). Operational teams have to work with the project team to deliver an implementation and show real business benefits. The literature suggested a handoff between the project team, who are responsible for planning and implementation, and the operations team, who are responsible for institutionalising the benefit (Cooke-Davies, 2002). Kloppenborg *et al.* (2014) further research suggest that the role of a project sponsor is a key attribute to project success and that it should form part of all the relevant stages of delivering a project. Other senior executives that form part of the project board are also key project stakeholders and are responsible for terminating projects (Unger *et al.*, 2012) and ensuring the correct amount of risk and innovation is applied (Boehm, 2000).

This study found truth in the necessity of the involvement of all these players but found a crucial gap in the clarification of each player's role. The conflict between project executives and managers and their operational counterparts lead to great disparity in the perceived outcome of the project. The conceptual model introduced in Figure 6.1 thus aims to clarify the essential roles as well as the key tasks these stakeholders need to perform. The model further aims to clarify at what point in a project's delivery cycle each player's involvement should exist, as the data gathered in this study showed contradictory evidence regarding a handoff between the project team and operations (Cooke-Davies, 2002). Most respondents in this study felt that greater collaboration and dedicated involvement from business teams would have greatly benefited the programme and improved overall delivery.

6.3.1.1 The project sponsor

The analysis in this study agreed with Kloppenborg and Tesch (2015) about the impact the executive sponsor has on the outcome of a project. Interviewees, however, went further than suggested in the literature by specifying three key attributes regarding the executive sponsor. First, the sponsor should not be committee-based. A single natural person should be ultimately accountable. Secondly, the sponsor should be constant throughout the process and should be responsible and involved in all phases of project delivery. Finally, the project should be business-owned – and dependent on its size – preferably by the most senior executive or chief executive officer.

6.3.1.2 Information technology executive sponsor

The second stakeholder identified through this research is a separate IT executive sponsor. In this specific case study, this was the chief information officer, but this role can vary based on the organisation and project size. It is very important that the roles and tasks are clearly clarified between the ultimate executive sponsor/owner and the most senior IT executive. The model in Figure 6.1 depicts three core tasks for the IT executive sponsor. First, the IT executive sponsor is responsible for assisting the business sponsor with evaluating and making decisions on the technology to be used. As an IT expert, this task and accountability should fall on the IT executive sponsor, and the chief executive officer/business sponsor should hold this person accountable for decisions relating to this task. The second core responsibility of the IT sponsor is to choose the appropriate project delivery methodology (right to left or left to right). This is further explained as part of the efficiency-related project success factors. The final task

responsibility of the IT executive is to provide system stability. This assures the business that a system will be up and running at the desired speed for them to realise their intended benefits. The IT executive sponsor would thus not be held accountable for the business benefit delivered but rather for the efficiency and performance of the system.

6.3.1.3 Project manager and project team

The third stakeholder is a summary of the roles that are loosely referred to as the project team and aligns with the definition of Cooke-Davies (2002). This includes the project manager, business and system analysts, and all programmers working directly on the project. The overall accountability for the tasks in this stakeholder group will ultimately fall on the highest ranking individual (usually the project manager). It is very important to realise that the IT executive sponsor is deliberately excluded from this group because of the sheer size of the projects this model intends to apply to as well as to ensure that implementation and planning remain independent. This independence allows IT executives to make decisions freely regarding technology and the method of implementation without bias from a project manager. The project team is first responsible for providing the IT executive sponsor with pre-project proof of concepts to assist the IT executive sponsor with the decision regarding the technology and method to use.

After project commencement, the project team is responsible for the delivery of the efficiency phase, ensuring the accurate management of time, resources and the location of work. The measurement of success and benefit tracking for this stakeholder group is dependent on the methodology choice of the IT executive sponsor and could consist of on-time, in-budget or in-scope delivery. A major part of the efficiency school of thought is aimed at the project management task of this stakeholder. This includes the literature regarding implementation style (Thakurta, 2012). It is the project team that will choose and implement the most appropriate implementation style and make the ultimate decision regarding Waterfall, Agile and value-driven change leadership (Hidding & Nicholas, 2014).

6.3.1.4 The business non-sponsor

The business non-sponsor stakeholder group is the business team that is referred to as operations (Cooke-Davies, 2002). This group includes all business partners that will make use of a fully implemented system or programme and is not limited to the operations team. This

stakeholder group thus refers to any business users and could include functions such as finance, human resources, product managers and operations. The literature and results of this study confirm that the continuous involvement of these stakeholders is a key aspect of project success.

This case study suggests that business non-sponsor involvement is crucial during all three phases of project delivery and thus mirrors the involvement of the business executive sponsor (Kloppenborg *et al.*, 2014). Business non-sponsor stakeholders should first help identify possible gaps that could lead a project to improving effectiveness. Secondly, they should be directly involved in the implementation to ensure minimum rework and fast adoption. Lastly, as also postulated by Cooke-Davies (2002), these stakeholders should deliver on the benefits. The analysis in this study confirmed the sentiment that business benefit only starts post project delivery and is in the hands of the operational business team.

6.3.1.5 Independent governance board

One of the two new stakeholder groups that were inductively introduced from the data analysis was the independent governance board. Literature refers to governance as part of the efficiency school of thought, and it is often criticised as being a stumbling block to agile project execution (Goh *et al.*, 2013). However, it was revealed in this study that the addition of an independent, highly skilled governance board as a key stakeholder to project planning, delivery and outcome is a crucial factor of effective delivery. The study found that the external governance board should perform three core tasks. First, during the planning phase, the independent board should share independent key learnings from competitors and previous projects that inform the decisions made by the business and IT executive sponsors. Secondly, the governance board should be the mediator for all conflicts, especially between business and IT teams, during the execution (efficiency) phase of project delivery. Lastly, the board should be responsible for an independent benefit and outcome analysis that should inform the business sponsor of the perceived third-party outcome of the programme.

6.3.1.6 The market

The final stakeholder that plays an increasingly pivotal role in the outcome of a large project is the market. Project termination does not always imply project failure (Boehm, 2000). It is thus extremely important to manage the perception and expectations the market has regarding large

system implementations. This study confirms previous research that suggests that senior executives and sponsors should be responsible for the termination of the project (Unger *et al.*, 2012). This study, however, identified the market as a key stakeholder that stops sponsors and executives from terminating failing projects due to premature benefit communication. Large listed organisations are prompted to explain large project costs and often fall into the trap of overestimating and promising business benefit. This increases the pressure from the market that values the firm based on future benefits.

Three key actions regarding the market and communication regarding future benefits were identified in Figure 6.1. The first action is that during the planning and pre-planning phase of a project, communication about the deliverable to the market should be very limited. Research and development should be costs that can be written off without an in-depth explanation to the market. According to the second action, during the execution phase of a project, cost is due to escalate, and some formal communication to market analysts will be necessary. During this phase, expert communication and market management is needed to successfully manage the expectations without increasing the external pressure unnecessarily. With the third action, the market plays a natural role in externally tracking the project benefits that were realised. An organisation's share price will always be impacted by large-scale information system implementations, and this serves as a good independent measurement tool.

6.3.2 Project outcomes and benefit measurement

The outcome of a project will always lean towards the metric on which its stakeholders are being measured (Bouwers *et al.*, 2012). Chen (2015) contended that a large percentage of overall project success can be attributed directly to the way the programme is measured. It is therefore a critical driver of the overall effectiveness of a project. During this case study, it became very clear that the business case was adjusted multiple times to manipulate a desired outcome. The way in which a programme and especially the individuals in a programme are measured was identified as a critical missing factor in this study. The head of measurement for this organisation, as an example, was not involved in any of the benefit planning or validation and was only asked to measure some of the project efficiencies during project execution.

Basten *et al.* (2011) suggests that project measurement remains an ongoing concern for most projects and that it should be broken down into process efficiency and project outcome measurements. This mirrors the findings in this study where interviewees felt that accurate

effectiveness measurement was probably the most difficult task to perform. They did, however, agree that the accurate identification of appropriate effectiveness measures that can be translated into process efficiency measures would help drive the overall project in the right direction. Measurement, however, needs to first be consistent, not allowing the business case to constantly change as results are not being met. Secondly, measurement must be done by an independent capability.

Figure 6.1 illustrates the high-level tasks of such an independent capability across the project delivery phases. First, the team has to be involved in the development and validation of the business case. This is a critical task during the planning phase of any project, as it will help shape the ultimate outcome. Secondly, during the execution of the project, the measurement capability is responsible for measuring the process efficiencies. Nevertheless, Basten *et al.* (2011) suggest that “adherence to planning” is an irrelevant measure if not linked to the correct business case and effectiveness outcome. It is thus of utmost importance that the metrics and measurement during the execution phase mirror and support the overall project objectives. Finally, the measurement capability is responsible for the formal measurement of project success. Customer impact is regarded as the most accurate measure of project outcome (Basten *et al.*, 2011). Financial returns and benefits are almost impossible to measure according to most respondents in this study who agree with the fact that customer satisfaction and/or impact should be the ultimate driver in a service-related organisation. According to Shao *et al.* (2012), the impact the project has on other areas and projects should also be a key outcome measurement for any large implementation.

6.3.3 Scope identification and technology selection

Two themes that emerged through the inductive analysis of the interviews were that of scope identification and technology selection. No recent literature particularly focused on these themes although they are very common in all articles relating to the project sponsor. Kloppenborg *et al.* (2014) point out that the executive sponsor’s most important role is to correctly identify and scope a project before initiation. This also includes the selection of the appropriate technology in and IT-related programme. Findings in this study, however, suggest that the finalisation of scope should include all aspects of the business and especially the operations team where most opportunities for improvement are identified. From the findings, it was further concluded that the selection of technology should remain an expert opinion and the responsibility of the IT project executive.

6.4 The efficiency-related actions that impact overall project success

6.4.1 Project methodology

Vast literature exists regarding the different project execution styles or methodologies. Most of these theories and models are based on two broader frameworks (1) the Waterfall and (2) Agile methodologies (Thakurta, 2012). Recent literature focuses on the empirical practices of Agile (Goh *et al.*, 2013) and other variations of Agile such as value-driven change leadership (Hidding & Nicholas, 2014). The majority of project success studies have been focusing on the programme management methodology, and this leads the researcher to hypothesise that this would indeed be the largest contributing factor of success. An extremely striking finding, however, was that none of the respondents mentioned these execution models as important success factors in the case study. They did however all make mention of a project methodology they called “Schedule is King”.

Schedule is King refers to a right-to-left project methodology that is a level higher than the execution models referenced above. It is based on three variables of a project: (1) time, (2) budget and (3) scope. These variables are all related to one another and are influenced by changes in any of the other dimensions. A right-to-left approach or Schedule is King, as it is referred to in this case study, implies that the time dimension of a project is fixed. This means that the end date is a non-negotiable variable and that all actions and tasks that come after this date are subject to this hard deadline. Because these three variables are all influenced by one another, a fix in the delivery time would impact the budget and the scope of a project. When issues arise during a right-to-left project, the results will be either an increase in the budget needed to complete the project on time or a reduction in the overall scope of delivery to ensure on-time and on-budget delivery. In some cases, an extreme view of right to left, such as the Schedule is King mindset in the case, could result in both budget increases and scope reduction. A right-to-left approach could also entail a fixed budget, but this would usually have significant scope impacts, as project time and budget are very closely correlated.

The opposing project methodology to Schedule is King is a left-to-right project approach. In this methodology, the scope of a project remains fixed. This means that the initially anticipated benefits take priority and that a project is allowed to go over budget and over delivery time as long as the initial expected level of delivery is met. This project methodology thus focuses on

meeting the benefits and requirements that were identified and would easily delay roll-out to ensure stability and value.

An interesting finding from this case was that the IT teams and executives preferred a right-to-left approach. They felt that this was the most successful project methodology, as it forced delivery. The business teams and, in particular, the executive sponsors, however, had completely opposing views. They opined that the business benefit should drive all projects and that the overruns should be managed by the project team as project efficiencies. Both stakeholder groups, nonetheless, agreed that no project should change this core high-level methodology in flight. In the case used for this study, the methodology was changed three times and created immense inefficiencies and confusion. This study further concludes that the IT executive sponsor should be the stakeholder responsible for deciding on the high-level project methodology. After this has been finalised, the project manager and team can choose any combination of Waterfall or Agile execution models to execute the project. It is thus of extreme importance that the IT executive sponsor, together with the business executive sponsor, ensures that the project team and non-sponsor business stakeholders are clear on the high-level project methodology to be followed. All lower-level project management execution models and styles mentioned in the literature should be at the discretion of the project management team that is ultimately responsible for either on-time delivery (right to left) or ensuring all scoped requirements are met (left to right).

6.4.2 Skills, time and location management

The next group of findings from the case study is really around effective project management. Kolltveit *et al.* (2007) refer to this as the (1) task and (2) transaction cost project management dimensions, where the focus is purely on ensuring the right people are performing the right tasks at the right speed. The interviewees highlighted having the correct skills as a major gap, especially in an emerging market. A large project requires many skilled analysts and programmers, and it is the role of the project manager and his/her team to ensure that these skills are first acquired, allocated, developed and retained. The project team should also be responsible for pre-project evaluation regarding the skill set available to inform the IT executive sponsor of the possible project and scope limitations.

A remarkable finding from this study was the overwhelming need from most interviewees for a centrally located project team. Most respondents felt very strongly about a co-located team. It is

the responsibility of the project manager to ensure that the project team is co-located for the duration of the project to ensure synergy and speed of execution. This seems like a trivial action, but a very important one nonetheless, as some other large institutions that went through similar projects reported massive increases in efficiency due to this change.

6.4.3 Dedicated business involvement

The final efficiency-related finding was the need for continuous and dedicated business involvement. This is in line with the findings of Cooke-Davies (2002) and Kloppenborg and Tesch (2015) who stated that business sponsors and operational teams are essential stakeholders during all phases of project delivery. Respondents in this case study felt that dedicated resources were needed from all business units involved to ensure project learning and speedy execution. A constraint in a business team's time was identified as a major contributor of roll-out delays and project re-scoping. It is thus of significant importance that the operational teams that will ultimately be responsible for delivering the business benefits be involved during the project execution phase, with no distractions or conflicting incentives.

6.5 The factors that influence project termination

Unger *et al.* (2012) submit that senior executive stakeholders should be responsible and comfortable with terminating failing projects. External project risks such as the markets can in some extreme cases contribute as much as 10% of overall project success (Carvalho & Rabechini Junior, 2015). The overwhelming majority of respondents felt that the project in this specific case had been showing signs of failure since its inception, still none of the senior executives have managed to terminate the programme.

The reasons for continuing with the project even after some early warning signs of failure are expectations and pressure from the market. Major business benefits were promised and priced into the company's share price to justify some of the large initial costs. These expectations were not adequately managed right from the start and resulted in increasing pressure from the market. A core finding from this study, as depicted in Figure 6.1, is that the market is an extremely important project stakeholder. Communication to the market should be strategically planned and not done prematurely. Research and development costs should not have to be justifiable until much later in the execution phase, and thus communication to the market should

also be minimal until the implementation phase. The market also contributes a fair amount of external risk to any project and should also form part of the overall risk management capability.

6.6 Project risk factors and effective portfolio risk management

Project risk and risk management have been identified as major contributors to project success (Carvalho & Rabechini Junior, 2015). Barki *et al.* (2001) identified some key risk dimensions that are particular to software implementations, such as (1) size, (2) technology newness, (3) integration, (4) lack of experience, and (5) the environment of the business. External risk factors that are not directly related to the project such as market pressure or economic climate also form part of an overall risk portfolio. Elzamly and Hussin (2014) go into much detail regarding the low-level specific risk during the execution phase of a project without taking into account other projects or the effectiveness project risk that exists.

This case study identified five high-level project risk betas that further influence the inherent project risk identified in the literature above. External project risk can contribute anything between 10% and 25% of total project risk (Carvalho & Rabechini Junior, 2015). For the purpose of this study, it was assumed that this inherent risk contribution is 20%. This is the alpha (α) value or minimum unavoidable risk that can be seen throughout the risk analysis in Chapter 5.

6.6.1 Project risk formula

The five high-level risk betas identified during this study were combined using their relationship to the minimum unavoidable risk (alpha) to create a project risk formula. This formula derives a score out of 100, with 100 being the riskiest a project could ever be.

Project Risk = (vβ * α) + (wβ * α) + (xβ * α) + (yβ * α) + (zβ * α)

1. vβ: Project Size beta

   The project size beta refers to the impact overall project size has on the risk of delivery. Figure 5.2 in the analysis section shows the exponential increase of project risk as a project moves from a continuous improvement enhancement to a large transformational project. The project size beta has a non-negative exponential slope.

2. wβ: Legacy integration beta

   Figure 5.5 illustrates the linear relationship legacy integration has on the overall project risk. The more integration and legacy systems involved, the closer to 1 the legacy integration beta will get. The legacy integration beta has a non-negative linear slope with a maximum of 1.

3. α: Inherent unavoidable project risk

   As already mentioned, alpha represents the minimum unavoidable project risk. This includes both internal and external risk and is estimated to be between 10% and 25%. For the purpose of this formula, alpha is always seen to contribute 20% of total risk.

4. xβ: Project time beta

   Figure 5.6 illustrates the impact project time has on the overall risk of a project. Initially, more time reduces the risk of delivery. The project risk is however seen to dramatically increase after five years as institutions become impatient and project risk appetite decreases. The project time beta can thus be negative and reduce overall project risk. It can however also exponentially increase project risk as it passes the five-year mark.

5. yβ: Team size beta

   The team size beta, as depicted in Figure 5.4, has a linear relationship with project risk as the project team size increases up until a certain point. This study found that after a project team grows to more than 700 team members, the project risk exponentially increases, as the complexity to manage the team rises. The team size beta is thus a non-negative non-linear beta of overall project risk.

6. Zβ: Change in sponsorship beta

   The change in sponsorship beta should be seen as a major inflection point and is illustrated in Figure 5.3. The change in overall executive sponsor during any phase of the project has a massive impact on the overall risk of delivery. The change in sponsor beta is a mutually exclusive event that either has a value of 1 (if any change in sponsor occurred during the project) or 0 (when no sponsor change occurred.) A change of sponsor will thus contribute an additional 20% to the overall project risk, as it was identified as a major risk indicator in this case study.

To illustrate the usage of the above project risk model, the case study used in the research project will be used to derive a total project risk score.

1. Vβ: The project used for this case was the biggest project ever recorded on the African continent, estimated to cost close to R40 billion by its final completion. The project size beta thus takes a 0.85 estimated value.

2. Wβ: The legacy integration needed for this project was more than double the amount required in any other similar related project. According to one of the senior executives interviewed, legacy integration contributed close to 70% of the total cost. The legacy integration beta thus also scores a 0.85 estimated value.

3. α: The alpha value of inherently unavoidable risk is as previously stated at 20%.

4. Xβ: The project time of this case study is more than 10 years at this point. The original benefit (negative beta) is thus foregone, as this project took longer than the desired five-year maximum period. The project time beta for this project is thus estimated at 0.70.

5. Yβ: The team size beta was well managed in this case study due to learnings from partners that previously attempted similar programmes. Team sizes were deliberately reduced to stay under the 700 threshold; therefore, the team size beta is estimated at a value of 0.4.

6. Zβ: There have been two crucial changes of overall executive sponsor in the case study used in this study, and the value of zβ is thus 1.

All the aforementioned values estimated are then added to the formula to calculate an overall risk score for this specific project.

Project Risk = (vβ * α) + (wβ * α) + (xβ * α) + (yβ * α) + (zβ * α)

Project Risk = (0.85* 20) + (0.85*20) + (0.7*20) + (0.4*20) + (1*20)

Project Risk = 76%

The overall project risk estimated score of 76% reflects the project in the case study as of extremely high risk. This result correlates with the notion that this specific project is billions of rands and many years over the original schedule and budget estimates. The model will however have to be empirically tested against other known cases to confirm the accuracy of the results. The alpha value should also further be unpacked to ensure the 20% given value is in all cases the most accurate measure of minimum risk. Every project should be evaluated individually and as part of a project risk portfolio to ensure the most accurate measure of project risk is managed.

6.6.2 Project portfolio risk management

Teller (2013) and Teller *et al.* (2014) introduced the idea of portfolio risk management. These studies argue that projects do not exist in isolation and that an entire project portfolio should be assessed and managed for risk. Findings in this case study support this notion, as respondents introduce the concept of a project ecosystem. Most projects share resources from a central pool of resources. These resources thus work on many different projects at any given time. Figure 5.7 shows the relationship between these shared resources and the projects they are involved in. It is vital to note that two types of projects exist within these ecosystems. First, “run the organisation projects” can be defined as smaller projects that form part of the continuous improvement of any institution. Second, “change the organisation projects” refer to large-scale projects that alter the very way an organisation operates. These projects were also found to be dependent on each other in many cases, and the interviewees mentioned that this dependency risk has a major impact on overall project success.

Taking the foregoing into consideration, it is thus very important to rate each project individually and as part of the ecosystem when deriving overall project risk. Risk management boards are

also usually specifically focused on individual projects and should be expanded to cross-project ecosystem risk committees. Risk management is a continuous process that evolves with the relevant project phases (Didraga, 2012). It is thus of utmost importance to use learnings from any other projects or external parties and include them into the overall portfolio risk management system. Risk management hence entails the collecting and management of risk-related information from both known and new sources of risk across an entire project ecosystem.

Chapter 7: Conclusion

7.1 Introduction

The penultimate chapter focused on the findings of this study. This final chapter will provide a conclusion, major findings, and limitations of this study. Suggestions for future research will also be provided.

7.2 Major findings

Although approximately 61% all projects fail (Standish Group, 2013) and despite an abundance of research regarding this very sensitive and costly topic (Hidding & Nicholas, 2014), research is still very indecisive of the exact reasons for project success and failure (Fortune & White, 2006). Most research is divided about what is believed to be two mutually exclusive schools of thought regarding the effectiveness and efficiency dimensions of project execution (Hidding & Nicholas, 2014). This study creates a high-level conceptual model of overall project success factors and actions that spans across all phases of a large-scale information system project. This high-level integrated task model is one of the few research studies that provide an organisation-wide bird's eye view of project success. It also serves as a very useful summation of recent in-depth studies regarding the individual project tasks across both schools of thought and the integration between these tasks across multiple phases of a project.

The first major finding of this study is the connectedness of the two schools of thought and the proposed sequencing of these methodologies into three project phases. The first project phase forms part of the effectiveness school of thought and is the planning and pre-planning phase of project development. The second phase focuses purely on the project efficiencies and can be summarised as the project execution phase. The final project phase identified is the project outcome phase that focuses once again on project effectiveness by measuring the outcome and benefits delivered. This sequencing forms the backbone of the model created by this research and can be seen in Figure 6.1.

A second major finding was the role clarification and major tasks each of the project stakeholders have to play. Stakeholders were carefully grouped as per Figure 6.1, and specific high-impact tasks that are critical to a project's success were allocated to each stakeholder group. These stakeholder tasks can serve as a project blueprint for any large system

implementation and covers all the key findings across the effectiveness as well as efficiency phases of a project. In addition to the core project tasks, the study also identified two new core stakeholders: (1) the market and (2) an independent governance board. These two stakeholders have massive contributions to the overall success of a project and should be included in any large IT programme.

The need for an independent measurement capability is another major finding from the above study. Measurement and metric very often shape the overall outcome of projects (Bouwers *et al.*, 2012), and it is believed that a large percentage of the outcome of any project is purely attributable to the way it was measured (Chen, 2015). This study concludes that the involvement of an independent measurement capability in the design and validation of the business case will allow for the necessary integration in the efficiency metrics and drive the project towards its intended outcome.

Another critical finding is the need to adequately manage the role and expectation of the market when executing any large system implementation. The appropriate change management process should be followed, and special caution should be taken not to communicate expected business benefits prematurely.

A final major finding in this study is the need for an appropriate project and project ecosystem risk capability. The study further identified five core risk betas that can be used to accurately estimate the overall project risk that exists within any system implementation. This formula was successfully applied to this specific case study and verified with the organisation's top management to ensure its fit. These five risk factors should form the core of any project's risk management capability and should also be used to measure project portfolio risk. Project portfolio or ecosystem risk management is an important concept that contributes greatly to the overall success or failure of a large project.

All major findings discussed in this study, together with some of the theory behind them, is summarised in Figure 6.1 in Chapter 6. This model provides the high-level blueprint to successful project implementations across the three phases of project delivery.

7.3 Management implications

The majority of the South African financial sector is still running on old legacy IT systems and will have to undergo a similar exercise to the one analysed during this case study. Bloch *et al.* (2012) suggest that a staggering 17% of these projects will go so bad that they threaten the very existence of the companies attempting them. The organisation used in this case study has spent almost four times their annual profits in an attempt to execute this massive system implementation. The conceptual high-level task model delivered by this research can serve as a very comprehensive blueprint from real business and academic learning to any organisation entering into this process over the next few years. The model will provide them with the necessary learnings from a live case study that spanned more than 10 years of execution as well as a compressive summation of recent literature and trends regarding project success.

The study further provides organisations with a comprehensive risk management formula that can be used to accurately estimate an individual and/or project ecosystem's risk. This risk estimation formula should be used carefully and as an indicative metric only until empirically tested and proven in further research. The formula will, however, give an accurate indication of the overall risk banding, i.e. very low, low, medium, medium-high or very high. It will be up to the organisation's own discretion to define these boundaries depending on the accuracy of their beta estimations.

The study lastly provides the company, and its senior executive sponsors that were used for this research with an in-depth and independent synopsis of the project delivery over the past 10 years. Many great things were achieved during the process as well as some setbacks and key learnings from mistakes. This study provides the leadership team with a comprehensive and unbiased view across all the phases of delivery that can be used to evaluate and learn from for future projects.

7.4 Academic contribution

It has been highlighted before that some overlapping arguments have been made over the past few years that most research regarding the success of information systems have been relatively indecisive (Fortune & White, 2006). This study concludes that the reason for the indecisiveness regarding project success factors is largely because most research has been very detailed and focused predominantly on only one of the two schools of thought regarding the topic.

This piece of research contributed to the recent academic literature in three significant ways. First, it combines the effectiveness and efficiency schools of thought into a sequentially phased delivery process that highlights the important interplays across the two methodologies that are usually analysed in isolation. Secondly, it provides a high-level bird's eye blueprint conceptual model for overall project success that can be used as the foundation for future contributions and empirical evidence. This research thus allows for a paradigm shift away from the current trends towards project management design and agile execution to a more comprehensive holistic view of project delivery from an organisation's perspective. Finally, it serves as a summation of some of the most relevant research topics in this field of study over the last decade. It also illustrates some of the integration points and counterarguments to some of the recent work done regarding project success factors.

7.5 Research limitations

7.5.1 Limitation of interview design

The interview schedule used to guide the interviews was deduced from the literature review and posed very specific themed questions to respondents. Subsequently, new themes were inductively extracted from the open conversations in the interviews that could not in all instances be adequately checked and verified by all interviewees. The reason for this is because of the seniority of some of the executives interviewed. These executives could not be reached for a second follow-up interview to discuss some of the new constructs, as their schedules just did not permit such an interaction.

7.5.2 Limitation of qualitative analysis

As mentioned in Chapter 5, an in-depth code generation exercise was performed with the assistance of an external party. This was largely done to eliminate any of the researcher's biases as stipulated in Chapter 4. This external code generation, however, was not as streamlined as would have been desired due to the limited understanding of the research topic. Ideally, a few more perspectives on the same data set should have been obtained from other independent coders to ensure absolute unbiased results. As it stands, the researcher still had to perform the majority of the code generation, and this study could thus still include some of the researcher's specific biases mentioned in Chapter 4.

7.5.3 Limitation of the population sample

As this was a case study regarding a specific entity and project, a clear limitation exists respecting the population sample. Interviewees, although diverse in their involvement, are all from the same organisation, which results in a limitation on factors such as organisational culture and any other external project factors that need to be verified across organisations or industries.

The population sample further only focuses on the financial industry in one specific country, namely, South Africa. This clearly limits the assumptions that can be made across other industries and areas where demographics are totally different. The project used for this study is, however, the largest and only project of this scale done on the African continent to date, which does allow for some generalisation towards a larger population because of the lack of any other related data. This conclusion should, however, be updated as more data becomes available over time and as the findings and conclusion of this study are empirically tested and proven.

7.5.4 Risk formula limitations

The risk formula that was derived in Chapter 6 should be used as an indicative tool to estimate risk bandings of projects and not as absolute science. The mathematics applied to the five risk betas were scientifically calculated as exact beta/slope indicators and should thus not be used as such. It is important to remember that this is an exploratory study and that all models and formulas should thus be used in accordance and with caution.

The first limitation of the risk formula is that it does not allow for weighting of any of the factors. This means that a change of sponsor and project size, as an example, is deemed to have the exact same impact on project risk. This however clearly is not the case and should be empirically researched to identify the correct weighting of each independent risk factor.

The value applied to the alpha (α) variable in the formula, although grounded in literature, is largely still based on the assumptions of the researcher. The 20% minimum unavoidable risk factor should thus be analysed based on each specific case and empirically verified before assumed to be fact. It is however a theoretically sound starting estimation point based on the verification done in the case study.

The omission of other risks is the final limitation that was identified with the risk model constructed in this study. The model currently adjusts for all other risks through the alpha variable and uses only the five risk betas identified in this study to define risk. There could however be more risk betas that are attributable to the overall risk that was not identified during this study. These risk betas should be included into the calculation if found relevant.

7.6 Proposed future research

As mentioned in Section 7.4, this study allows for a paradigm shift in the academic research regarding project success. It delivers a high-level overview from an organisational perspective to project success. This allows future researchers to build on the concepts introduced in this study regarding the sequencing of the effectiveness and efficiency-related success factors of a project. It moves the focus away from in-depth project management methodologies and allows for the exploration and testing of integrated organisational project models.

Specific suggested research will be the empirical testing and validation of the high-level conceptual task model revealed in Figure 6.1. This model should be tested in other industries and/or organisations across different geographic areas. A second suggested research topic would be the empirical analysis of the risk beta formula that was generated in Chapter 6. This formula has the potential to provide management and literature with a highly relevant regression formula to predict overall project risk.

Some other possible research to be conducted regarding this topic would be on the project methodology called Schedule is King that was introduced in this study. The left-to-right and right-to-left project methodologies do not seem to have any conclusive evidence of their comparative success and would be well worth studying. Finally, more empirical evidence could also be obtained regarding the two new stakeholders that were introduced in this model, namely, (1) the independent governance board and (2) the market. Very little research exists regarding these two critical project stakeholders and the impact they have on project success.

7.7 Conclusion

The findings from this exploratory case study delivered a comprehensive conceptual model that covers all the high-level phases of successful project delivery. It has highlighted that even when some tasks that have a significant impact on the overall outcome of a project are performed exceptionally well, success is not guaranteed. Project success only occurs when all critical tasks across the effectiveness and efficiency dimension of a project are planned, performed and measured accurately and by the correct stakeholder groups in a project ecosystem. This study can thus serve as a conceptual blueprint for successful project implementation and provides a comprehensive formula for the accurate identification of project risk.

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Appendices

Interview Schedule:

Gordon Institute of Business Science
University of Pretoria

Interview Schedule

Note: *The below schedule is merely a guideline. The researcher will attempt for the conversation to be as much of an open discussion as possible. This will be done to remove any possible biases*

1. Introduction Questions (10 Min)
    a. Please tell me about yourself and the role you play in the organisation
    b. What role did you play in the Core Banking System implementation?

2. Effectiveness Pre Project Questions (15 Min)

    a. Please tell me about your involvement in the Planning of the CBT program
    b. Do you think we planned well?
    c. What do you think we could have done better?
    d. What did we do very well?
    e. Who else should have been involved during the planning?

3. Efficiency Questions (15 Min)
    a. How do you feel the implementation has gone to date?
    b. What have we done well?
    c. What could we have done better?
    d. Do you believe we have control over the costs, and timelines of this project?
    e. Have we and are we going to meet all the timelines?

4. Effectiveness Measurement questions (10 Min)
    a. How do feel the program has performed?
    b. How would you measure success?

5. Open discussion (10 Min)

Ethical clearance:

Gordon Institute of Business Science
University of Pretoria

Dear Mr Paul Whelpton

Protocol Number: **Temp2015-01283**

Title: **Understanding the success factors of a large scale transformational system implementation in an emerging market**

Please be advised that your application for Ethical Clearance has been APPROVED.

You are therefore allowed to continue collecting your data.

We wish you everything of the best for the rest of the project.

Kind Regards,

GIBS Ethics Administrator

Consent letter:

Gordon Institute of Business Science
University of Pretoria

Dear Participant

I am conducting research on the success factors of a major information system implementation in an emerging market. The aim of the research is to understand the various factors and decision points that will have an effect on the overall outcome of a project.

Our interview is expected to last about an hour, and will help us understand the various decision points and stakeholder impact of a large scale information system implementation. Your participation is voluntary and you can withdraw at any time without penalty. **Of course, all data will be kept confidential.** If you have any concerns, please contact my supervisor or I.

Our details are provided below.

Researcher name: Paul Whelpton

Email: 443853@mygibs.com

Phone: 0825629246

Research Supervisor: Dr Caren Scheepers

Email: scheepersc@gibs.co.za

Phone: +27 11 771 4228

Signature of participant: _____Date: _____

Signature of researcher: _____Date: _____