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An Investigation Into The Consensus Surrounding Information Systems Project Success

A dissertation submitted in partial fulfilment of the requirements for the
degree of:

Master of Business Science in Information Systems

Department of Information Systems

University of Cape Town

2005

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Acknowledgements

I would like to thank the following for their help and support during the writing of this thesis:

- Derek Smith as my supervisor
- The Department of Information Systems at the University of Cape Town
- My family and friends
- The financial assistance of the Department of Labour (DoL) towards this research is hereby acknowledged. Opinions expressed and conclusions arrived at, are those of the author and are not necessarily to be attributed to the DoL.

Danyal Hendricks

Abstract

The term 'successful project' in the project management literature has generally referred to a project that has been completed on-time, on-budget, and to-specification (Atkinson, 1999). The success of a project has thus been measured by the extent to which a project manager has adhered to these three criteria. The rate of project success according to these criteria, however, although on the increase has generally been poor (The Standish Group International Inc, 1999).

The concept of project success within the bigger project management body of knowledge has not been one of the more heavily researched topics. One explanation for this could be that the majority of past research has been focused at the practical (technical) level of project success (Morris, 2001). These papers have mostly asked the question: *'What are the processes necessary in order to efficiently manage a project?'*

Over the last decade, there has slowly been a growing recognition that the three criteria of project success used by The Standish Group and commonly accepted by the majority of project management researchers and practitioners are not the only indicators of the success of a project (Atkinson, 1999; Icmeli-Tukel & Rom, 2001; Wateridge, 1998). Various authors have thus proposed alternate models of project success, either at the conceptual or empirical level, and have advocated the viewpoint that the rate and level of project failure is not as bad as is estimated in The Standish Group's Chaos Report (The Standish Group International Inc, 1999).

However, this 'modern' thinking concerning the definition and measurement of project success has not pervaded the mainstream of project management literature, education and possibly project management practitioners. The variety of definitions and criteria of project success leads one to believe that there is a lack of consensus surrounding this concept.

This research investigated whether or not there is consensus around project success in the project success literature by conducting a content analysis on a sample of project management articles focusing on project success. This resulted in ten characteristics of project success that was considered current thinking of project success.

A survey was then conducted among Information Systems (IS) project managers in the Cape Town area, using these ten characteristics as a basis for comparison. Their response was then compared to that obtained from the content analysis.

It was found that the sample of project managers mostly agree with the project success literature. However there were points of disagreement:

- Project managers disagree that the traditional method of measuring project success is inadequate.
 - Project managers disagree about whether project success contains mainly subjective or objective measures.
 - Project managers do not believe that project success is an abstract concept lacks a standard definition and is difficult to measure.
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Chapter One - Introduction

1.1 Research Area

Project management as taught and practised, can arguably be seen as a separate discipline. Although drawing on other management disciplines, much of the knowledge in the field is unique to project management (Project Management Institute, 1996), with journals and organisations devoted to the study and advancement of the field.

Most definitions of project management today include the notion that the reason that a project exists, is to achieve some outcome, goal or objective. However, these outcomes, objectives or goals exist within the domain of another application discipline. An application discipline is considered as a discipline that commonly uses project management and project management techniques to achieve its ends. Thus, although it can be said that project management shares common traits between application disciplines, there are specific differences that arise between them. Figure 1 illustrates this concept using the Information Systems and Engineering disciplines as an example.

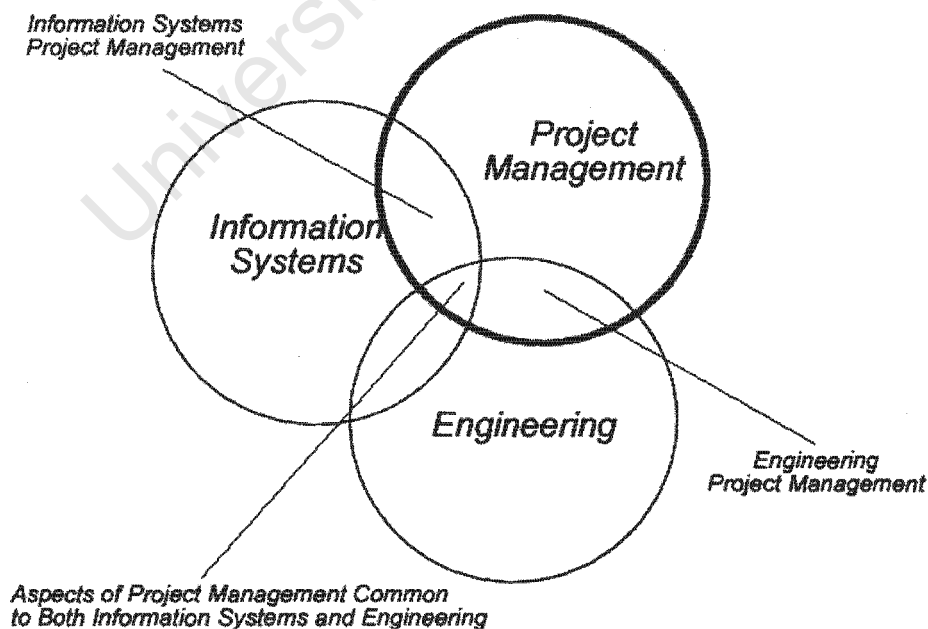


Figure 1: *Project management in relation to its application disciplines (adapted from Project Management Institute, 1996)*

This research focuses on project management and its application to the discipline of Information Systems. The relevance of project management within this discipline is that most, if not all, endeavours involving Information Systems are undertaken in the form of projects. From *strategic information technology planning* projects, to *software development* projects, to *information technology infrastructure* projects, the range of applicability of project management within the discipline of Information Systems can be seen.

Within the field of project management, this research looks at the concept of project success. More specifically, research focuses primarily on **Project Success Definition** – *how is the concept of project success defined and understood by project management practitioners as opposed to the project success literature*, and secondly on **Project Success Criteria** – *how is the success or failure of an information systems project measured by project management practitioners versus the project success literature*.

1.2 Background to problem

The project management literature has long been reporting on the high rates of information systems (IS) project failure that has become a characteristic of the industry (White & Fortune, 2002; Whittaker, 1999; Cannon, 1994; The Standish Group, 2001).

The Standish Group (2001), has conducted research into the rates of IS project failure since 1994. Their research reported that in 1994 only 16% of the projects surveyed were completed successfully, 31% having failed completely and 53% being challenged. The statistics in 2000 show only a slight improvement, with only 28% of the projects surveyed being considered a success, 23% having failed completely, and 49% being considered challenged (see chapter 2 for a definition of these statistics). Whichever way one looks at it a success rate of 16% is appalling, with 28% not being much better.

1.3 Statement of Problem

The definition of project success used by The Standish Group, comply with the generally accepted definition of a successful project used in the majority of project management literature (Atkinson, 1999). This being that a project can only be considered successful if it is completed on time, to budget, and to specification.

However, some authors who have conducted research into the phenomenon of project success have concluded that the above standard for measuring project success does not adequately describe the status or the outcome of a project (Atkinson, 1999; Icmeli-Tukel & Rom, 2001; Wateridge, 1997, Shenhar, Dvir, Levy & Maltz 2001). Others argue that there is a lack of consensus in the literature around the concept of project success, as well as the lack of a standard method of measurement for it (Baccarini, 1999; Lidow, 1999; Shenhar et. al. 2001).

If the authors mentioned above are correct in their arguments, then the rate of project failure as indicated by the Standish Group in their Chaos report (2001) is inaccurate because different criteria used for measuring project success would produce different figures. For example, one recent study asked project managers to rate their own perceived level of project success, by measuring project success on a scale of 1 (abandoned) to 7 (complete success). This study placed project success rates as high as 41% (White & Fortune, 2002)

The authors mentioned above have, as part of their arguments for project success, proposed alternate models and definitions of project success (or project success criterion). These have been either at the conceptual or empirical level. Although many of the models contain similar concepts, the authors claim that there is still no consensus over the subject. None of the authors however state what the domain of this lack of consensus is. Is it just within the project success literature, or is between the project success literature and practitioners?

The definitions of success and arguments proposed by these authors are explored in more detail in chapter 2.

The research problems can thus be summarised as:

- There is a lack of consensus concerning the definition of project success
- There is a lack of consensus concerning the measurement of project success

1.4 Research Objectives

Based on the stated research problems, the research objectives can thus be stated as:

1. To compare industry perceptions of project success against the current literature on project success.
2. To compare measures of project success used in the research literature versus those used in industry.
3. To attempt to obtain a combined viewpoint of project success and its measurement.

1.5 Research Questions

There are two main research questions for this research.

The first question tests the conformance of the concept of project success used in practice to that used by project success literature.

Do information systems project managers perceive the concept of project success in a way that is compliant with project success literature?

The second question seeks to compare the measures of project success in practice versus the measures proposed by project success literature.

Do information systems project managers use success measures that are compliant with the measures proposed in the project success literature?

1.6 Research Motivation

The motivations for conducting this research are two-fold:

Firstly, project management as a discipline is becoming an increasingly important part of contemporary organisations. This is evidenced by research such as Kloppenborg & Opfer (2002), who summarise the importance and growth of the discipline of project management in the past few years.

“The discipline of project management currently is being used as a key strategy to manage change in contemporary organizations. Consequently, the project management profession is undergoing tremendous growth worldwide as corporations, governments, academia, and other organizations recognize the value of common approaches and educated employees for the execution of projects”
(Kloppenborg & Opfer, 2002)

This research will contribute to a greater understanding of project management, as well as the context within which the managers of these projects operate, and thus contribute to the development of the fields of Project Management and Information Systems simultaneously.

Secondly, organisations, especially those utilising Information Systems, are to a greater extent becoming project driven. This is because of the nature of projects that allow them to achieve ‘out of the ordinary’ goals, within a shorter time period. However, there are indications from the project management community that the level of project success is still not high enough (The Standish Group, 2001). The measures of success used for these projects, however, are still based on the traditional on-time, on-budget and to-specification criterion. Thus, any contribution that aids in the understanding of projects and project management may contribute to the achievement of greater levels of project success (either based on a new method of evaluation or better project management performance).

1.7 Plan of Development

Chapter two of the thesis presents a survey of recent project success research literature, and highlights recent work that has presented alternative views of the concept of project success.

Chapter three describes the overall design of the research. It outlines the research problem that the research tackles, as well as setting out the research questions. Chapter four describes the methodology to be used in the first phase of the research, the approach to sampling, and finally describes how the analysis was conducted. Chapter five then discusses the results of the analysis.

Chapter six describes the methodology to be used in the second phase of the research, while chapter seven presents the results of the analysis. Conclusions are then presented in chapter 8.

Chapter Two – Literature Survey

This chapter starts by indicating the differences between factors and criteria, followed by a look at the definition of project success. It then proceeds to provide an overview of recent empirical attempts in measuring the level of project success. A description of various project success models presented by various authors is then presented.

2.1 Factors vs. Criteria

A search for the term project success in the project management literature brings up a wealth of research that has been done on the subject. Closer inspection, however, reveals that the majority of these articles focus only on critical success factors for projects. The project management literature seems to imply the term factors when using the term project success. For example, Cooke-Davies (2004) in an article titled 'Project Success' provides a brief section on definition and measurement and devotes the rest of the article to factors.

Surprisingly, many of these critical success factor articles do not include at least a brief discussion on the concept or definition of project success. These articles assume the concept of project success as known and do not define it or include criteria for its measurement. For this reason, articles focusing on critical success factors were not included in this study.

There is, however, a major difference between the concepts of success criteria, and success factors. The dictionary defines criteria as "*a standard by which something may be judged or decided*", and a factor as "*a circumstance, fact, or influence that contributes to a result*" (Soanes; 2001).

Applied to projects, project success criteria are the standards and rules that are used to judge the extent of the success of a project. They can be used as the basis for measurement. Project success factors on the other hand, are those things that contribute to the successful outcome of a project, but cannot be used as a basis for the measurement of the extent of the success (Lim & Mohamed, 1999).

A link between project success factors and criteria has been established by Westerveld (2003). This research is based on the European Foundation for Quality Management (EFQM) model, whose defining characteristic is the conceptual separation of the results of the business (what the business has achieved) from the management of the organisation (how the results were achieved).

This conceptual separation is applied to project management whereby in order to achieve a successful project, a distinction between the results of the project (project success criteria/results) and the way the project is going to be completed (critical success factors/organisation) needs to be made.

For every project, there will be a set of criteria that can be used to measure the success of a project (results), and a matching set of factors that can be used to increase the likelihood of its success (organisation). Therefore, choices on a how a project (organisation) is to be managed should be compatible with the goals of the project (results) (Westerveld, 2003).

2.2 Inadequacies of current project success criteria

One of the most widely known and quoted series of reports concerning project success are the CHAOS reports (The Standish Group, 1995, 1991, 2001). The report, published every two years, provides statistics about the rates of project success, as well as project success factors, and reasons for project failure.

The definitions used by the Standish Group classify a **successful** project as one which is completed *“on-time and on-budget, with all features and functions as initially specified”*, a **challenged** project as one that *“is completed and operational but over-budget, over the time estimate, and offers fewer features and functions than originally specified”*, and a **failed** project as one that *“is cancelled at some point during the development cycle”* (The Standish Group, 2001).

A ‘local version’ of the CHAOS report is available (called the PROSPERUS report), and provides rates of project success that reflects the situation in South Africa based

on the same scheme of measurement as the CHAOS report (Sonnekus & Labuschagne, 2003). The PROSPERUS report has higher rates of success than those in the CHAOS reports, while the level of challenged projects is lower.

A third report, published by Computer Weekly in the UK, attempted to identify the "State of IT Project Management in the UK" (Sauer & Cuthbertson, 2003). This report used similar dimensions to measure the performance of projects. These are: the variance against budget, the variance against schedule, the variance on scope/functionality, and abandoned. Although similar to those used by CHAOS and PROSPERUS, the authors do note differences in their study and hesitate to draw direct comparisons. This highlights a problem in comparability between studies. However, they do still provide figures for direct comparison (see table 1 below). The results of their study show a lower overall level of successful and failed (abandoned) projects, but a much higher level of challenged projects.

Year	Successful	Failed	Challenged
<i>Chaos - 1994</i>	16 %	31 %	53 %
<i>Chaos - 2002</i>	34 %	15 %	49 %
<i>Prosperus - 2003</i>	43 %	22 %	35 %
<i>Computer Weekly- 2003</i>	16 %	9 %	75 %

Table 1: Rates of project success (Sonnekus & Labuschagne, 2003)

The interpretation of these figures is in itself quite difficult. The authors of the PROSPERUS report speculate that perhaps local organisations adjust their measures of success during the project, or that not all project managers have experienced a failed project. These answers, however, do not provide much satisfaction, and the authors go on to state that "The way in which success is defined must also be clarified." (Sonnekus & Labuschagne, 2003).

White & Fortune (2002) recently conducted an empirical study into project management practices. Part of the survey inquired into the criteria used by project managers to assess the success of their projects. Completion within schedule (second highest) and completion within budget (third highest) still featured near the top of the list, with meeting customer requirements appearing at the top. Other items on the list were (in order): meeting organisational objectives, yielding business and other benefits, causing minimal business disruption, and meeting quality and safety standards. It should be noted that the size of the gap (in number of responses) between the top three criteria and the rest of the list is extremely large.

On its own each study seems to provide figures that are acceptable. However, once these are placed side by side, it can be seen that different approaches provide different results, and that even when the same approach is used, comparison is still difficult.

2.3 Project Success Models

The definition of success, as provided by the dictionary is: “the accomplishment of an aim or purpose” (Soanes; 2001). Thus one could define a ‘successful project’ as one that has achieved a desired or intended outcome. A simple viewpoint of project success is then: if a project achieves its goals it is successful.

Because of the inadequacies of traditional ways of measuring project success, over the years, research has been conducted in the area. The approaches used for defining and measuring projects success in this research have varied greatly. There seems to be as many approaches to measurement as there are articles on project success. And yet there is still no generally accepted method of measuring the success of projects.

The PMI’s PMBoK (Project Management Institute, 1996) fails to deal with the subject at all, while the Association of Project Managements Body of Knowledge (APMBoK) (Dixon, 2000) provides one of the most liberal approaches to defining and measuring project success. This body of knowledge argues that project success is context sensitive and therefore, every project should have unique success criteria. The

APMBoK also proposes that for each project, the success criteria should be defined and agreed at the beginning of the project and that (similar to Westerveld's (2003) link between success criteria and factors), these criteria will have a significant impact on how the project will be managed.

Shenhar, Dvir, Levy & Maltz (2001), in presenting a project success acceptance framework, proposed that project success be viewed as a strategic concept that should be used to align project efforts with the strategic goals of the organisation. This is based on the argument that the project has moved away from being a tool used to achieve operational goals towards being a tool that is used to achieve strategic goals. Shenhar et. al. (2001) differentiate between operationally managed projects, which focus on 'getting the job done' within time and budget constraints, and strategically managed projects, which focus on the achievement of better business results and increased market place.

In their research, Shenhar et. al. (2001) conducted a two-phase study in order to investigate the concept of project success. The first phase was a qualitative analysis from which four previously researched dimensions of project success were validated. The second phase was a quantitative analysis that tested and assigned various measures of success to the different dimensions. The dimensions of success along with their respective measures are shown in table 2:

Success Dimension	Measure
<i>Project Efficiency</i>	<i>Meeting schedule goals</i> <i>Meeting budget goals</i>
<i>Impact on the Customer</i>	<i>Meeting functional performance</i> <i>Meeting technical specifications</i> <i>Fulfilling customer needs</i> <i>Solving a customers problem</i> <i>The customer is using the product</i> <i>Customer satisfaction</i>
<i>Business Success</i>	<i>Commercial success</i> <i>Creating a large market share</i>
<i>Preparing for the Future</i>	<i>Creating a new product line</i> <i>Developing a new technology</i> <i>Creating a new market</i>

Table 2: Dimensions of project success and associated measures (Shenhar et. al., 2001)

Shenhar et. al. (2001) further hypothesised that the various dimensions of project success would not be equally important to all projects, and that project success is also influenced by time. Technological uncertainty was used as a means of classifying projects and it was found that different dimensions of project success were more important to projects of different technological uncertainty. A time dimension was also added to the model of project success. Shenhar et. al. (2001) found that the different dimensions of success varied in importance at different stages of the project lifecycle.

Lim & Mohamed (1999) sought to provide an answer to the phenomenon of why the same construction project could be considered successful by one party and a failure by another. The argument was that from the perceptions of the different stakeholders in a project, the outcome is viewed differently, and thus sought to answer what measures could be used for these different perspectives and how they could be generalised according to some practical classification.

Lim & Mohamed's (1999) answer is that the success of a project is normally viewed as the achievement of predetermined project goals. The problem, however, is that not

all stakeholders in a project have the same predetermined goals. Lim & Mohamed (1999) proposed that project success can thus be divided into two perspectives: the macro perspective and the micro perspective. The different stakeholders in the project would be concerned with a different perspective of project success.

The macro viewpoint of success asks first whether the project was completed, and if so measures the satisfaction of the users of the project. The measurement criterion for completion is time while the measurement criteria for satisfaction are utility and operation (see figure 2). The completion criterion measures whether the project is completed at all. The satisfaction criterion measures whether the product of the project is in use (operation), and if the users of the project are deriving benefit from it (utility). It is not always the case that the completion criterion must be strictly adhered to for the project to still be a success e.g. The Sydney Opera House was 15 years late but is considered as one of the great landmarks of Australia. The owners, users, stakeholders, and general public are concerned with project success at the macro viewpoint.



Figure 2: The macro viewpoint of project success (Lim & Mohamed, 1999)

The micro viewpoint of success asks only whether the project was completed according to a number of sub-criteria. These sub-criteria are time, quality, cost, performance, and safety (see figure 3). The developer and the contractor are the people who will mainly look at project success from the micro viewpoint.

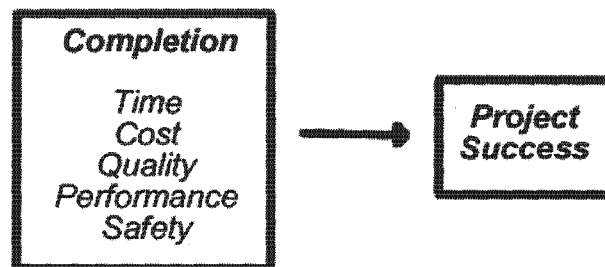


Figure 3: The micro viewpoint of project success (Lim & Mohamed, 1999)

Lim & Mohamed (1999) also recognised the temporal nature of project success. The model was extended by stating that the Micro viewpoint of success is only important during the construction phase of the project, while the Macro viewpoint is important throughout the whole project lifecycle.

Chan, Scott & Lam (2002) used existing research literature to identify success criteria for projects. However, the focus was on design/build construction projects - a particular type of construction project, where a single contractor is responsible for both the designing and building of the project.

Chan et. al. (2002) conducted a literature search for all articles focusing on project success in journals relevant to the construction industry. The result of the research was an assessment framework for assessing the success of a design/build project (see figure 4).

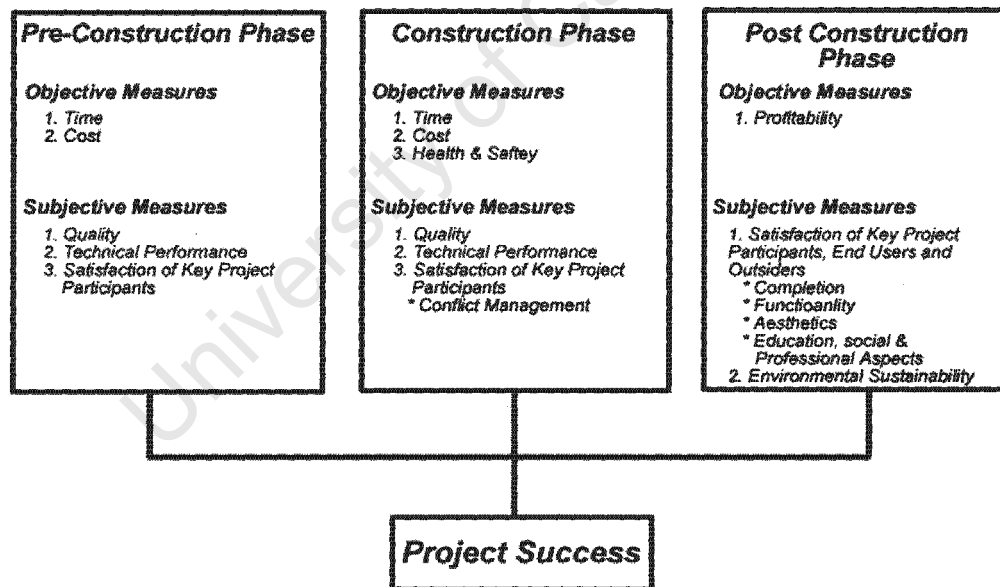


Figure 4: Assessment framework for design/build projects (Chan et. al., 2002)

The Chan et. al. (2002) assessment framework evaluates success at three different stages of a project. The three distinct phases identified are the pre-construction stage, construction stage, and the post construction stage. Within each phase are objective (hard) and subjective (soft) criteria specific to the construction industry. This model is

an amalgamation of older models of project success identified from the project management literature, with an application to design/build construction projects.

Westerveld's (2003) research into linking project success criteria to critical success factors resulted in six categories of project success criteria obtained from the project management research literature. These categories provide guidelines for identifying what aspects to measure when trying to determine project success. The categories are:

1. The project results according to budget, schedule and quality.
2. The results that the client requires from the project in order to consider it successful.
3. The results that the project team requires from the project in order to consider it successful.
4. The results that the users require from the project in order to consider it successful.
5. The results that the contracting partners require from the project in order to consider it successful.
6. The results that other stakeholders require from the project in order to consider it successful (stakeholders defined as those parties that are not directly involved in the project, but are still affected by it)

Baccarini (1999) used the Logical Framework Method (LFM) to investigate the concept of project success. The LFM was developed by the American Aid Agency to improve the project management of development products, and uses a top down approach to formulate a hierarchy of cause-and-effect linked project objectives, where the lower level objectives are the means with which to achieve the higher level of objectives. In this way, the hierarchy acts as a communication tool that allows the project team to clearly see targets.

Baccarini (1999) proposes that the concept of project success should be seen as the two interrelated concepts of product success and project management success. Product success deals with the success relating to the outcome of the project, whereas project management success deals with the effectiveness of the project management process.

Project management success can be further broken down and measured by the following components (Baccarini, 1999):

1. Meeting time, cost and quality objectives
2. The quality of the project management process
3. Satisfying the stakeholders requirements that relate to the project management process

Product success can be broken down and measured by the following components (Baccarini, 1999):

1. Meeting the project goal
2. Satisfying the users needs
3. Satisfaction of the stakeholders needs where they relate to the product

Four points arise from the separation of the two concepts of project success. Firstly the differentiation explains why a project can be considered a success and a failure at the same time. When this occurs, either one or the other components of project success were not fully satisfied. Secondly, project management success is subordinate to project success. The 'fitness-for-use' objective of product success is of a higher order than the 'conformance-to-requirements' focus of project management success" (Baccarini, 1999). Thirdly, project management success influences product success. Good project management will more likely lead to a good project, but will not prevent product failure. Fourthly, project management success is more of an internal project measure, while product success is more of an external measure. Internal measures are aimed at satisfying stakeholders inside the organisation while external measures are aimed at satisfying stakeholders outside the organisation.

Baccarini (1999) also identifies six important characteristics of project success in general:

- Success has both hard (tangible) and soft (intangible) dimensions
- Success is to a greater extent a perceived measure, where the different stakeholders will perceive the outcome of the project differently
- Success criteria can often conflict with each other based on the different perceptions of stakeholders and needs to be prioritised

-
- Success criteria are affected by time. Project management success is measured during and at the end of the project while product success is measured after the project is completed
 - The success of a project will not always be in the domain of the project manager
 - Project success can be partially achieved and is not 'black or white'

Icmeli-Tukel & Rom (2001) tried to address the discrepancy in the literature in terms of which project success measures are used in practice versus which project success measures should be used. The main argument is that this discrepancy manifests itself in the technical aspects of project management outweighing the customer-driven aspects. Icmeli-Tukel & Rom (2001) also sought out to establish whether the priority given to different success measures changes throughout the lifecycle.

The proposition is that the project manager's primary success measurement is the quality of the project. This being defined as:

1. Meeting the customers needs fully at the end of the project
2. Reducing the amount of rework on non-conforming tasks
3. Keeping customers informed about the progress of the project
4. Changing the course of work to meet the customers changing

It can be seen that Icmeli-Tukel & Rom (2001) assert a heavy emphasis on the customer in their definition of project quality.

The results of Icmeli-Tukel & Rom's (2001) study supports the hypothesis that the project managers' primary success measure of a project is quality, and that the emphasis on this measure stays constant throughout the project lifecycle. The multitude of project management literature focusing on internal project measures are thus 'deficient' when project managers prefer to focus on customer needs.

Wateridge (1998) focused his study on investigating the differing perceptions of IS project success from the viewpoints of the different project stakeholders. A list of criteria drawn from the literature that could be used to effectively measure the success of a project was proposed. These were:

-
1. The project should be profitable for the sponsor/owner and contractors.
 2. The project should achieve its business purpose in three ways (strategically, tactically and operationally).
 3. The project should meet its defined objectives.
 4. The project should meet quality thresholds.
 5. The project should be produced to specification, within budget and on time.
 6. All parties (users, sponsors, and the project team) should be happy during the project and with the outcome of the project.

These criteria were then tested among the different participants of information systems projects. It was found that there were major differences of opinion regarding success criteria among the project stakeholders. Project managers regarded budget, time, and user requirements as the most important criteria, while users emphasised user requirements and happy users over the other requirements. It was also found that project managers usually focus more on project management success (because they get appraised according to these criteria) while users focus more on product success (because they have to use the product that get made).

The conclusion that Wateridge (1998) reaches is that the determination of project managers to reach time and budget constraints at the expense of other criteria is causing a large number of IS projects to fail. Wateridge (1998) finally recommends that each project has a start-up activity where the success criteria are defined, ranked and agreed upon by those stakeholders that have a major impact on success. From these criteria, success factors can then be extracted.

Munns & Bjeirmi's (1996) main proposition is that '*project management*' and '*the project*' are two separate concepts that are often confused. The authors propose that the project is mainly concerned with defining and selecting a task which provides some kind of benefit to the company, while project management is mainly concerned with planning and control. Project management ceases once the project is handed over, while the project itself lasts until the product (outcome of the project) is no longer used.

Munns & Bjeirmi (1996) also argue that because the two concepts are totally different from each other, the success of the two should be measured differently. Project management success should be measured by how well the project was planned, executed, and controlled, while the success of the project should be measured by the perceptions of the stakeholders.

Figure 5 shows an extended version of the project lifecycle. The diagram shows a proportionate length of time for each phase that a project occupies, and indicates that the project management portion of a project occupies a very small time period in comparison to the rest of the 'useful' life of the project. Munns & Bjeirmi (1996) thus raise the point that since project management is only a subset of the project, it is possible for a project to be a success despite it not meeting budget or schedule requirements. Thus, project management techniques are not exclusively vital for project success. Different measures become important at different times of the project lifecycle and the success of a project is not totally dependant on project management success.

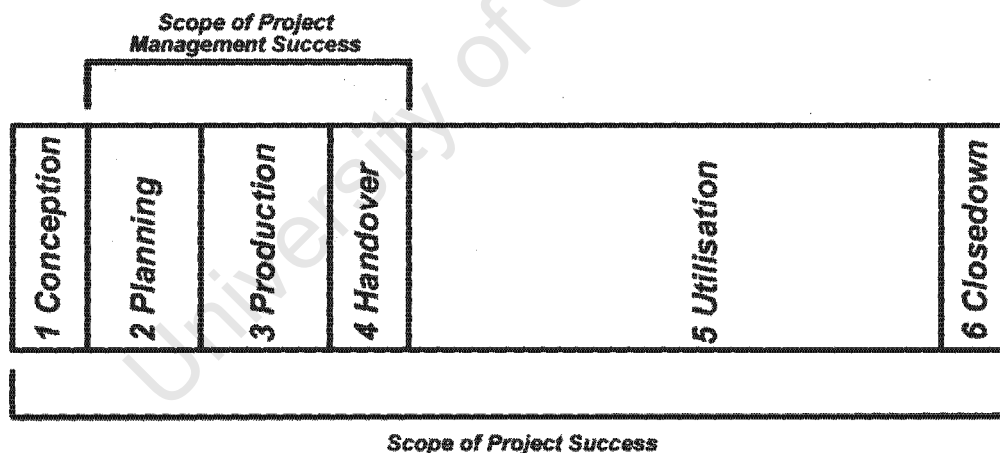


Figure 5: Dimensions of Project Success vs. Project Phase (Munns & Bjeirmi, 1996)

Munns & Bjeirmi (1996) thus propose that project performance can be assessed using three criteria at different phases of the project:

- The success of the implementation in terms of the effectiveness and efficiency of the project management techniques used on the project after the project management has been completed
- The perceived value that the users place on the product of the project once it is in use

-
- The satisfaction of the client against the original performance goals of the project once the project has reached the end of its useful life.

Atkinson (1999) argues that since as early as 1950, the criteria of cost, time, and quality (the iron triangle) have been included in the definition of project management. It is because of this reason that he claims the measures of project success have not changed despite the development of alternate definitions. He likens the use of the 'iron triangle' to a Type II error. A Type II error is when something is not done as well as it could be or is left out, while a Type I error is when something is not done correctly. Thus, using time, cost, and quality is not wrong, but is lacking something.

His proposed method of measuring project success, entitled 'The Square Route to Project Success' includes not only the iron triangle, but also the information system, benefits to the organisation, and the benefits to the stakeholder community (see figure 6). The iron triangle would thus include the usual measures of time, cost and quality; the information system would include measures such as maintainability, reliability, validity, information quality, and use. Benefits to the organisation would include measures such as improved efficiency, improved effectiveness, increased profits, strategic goals, organisational learning, and reduced waste, and benefits to the stakeholder community would include measures such as satisfied users, social and environmental impact, content project team, and economic impact to the surrounding community.

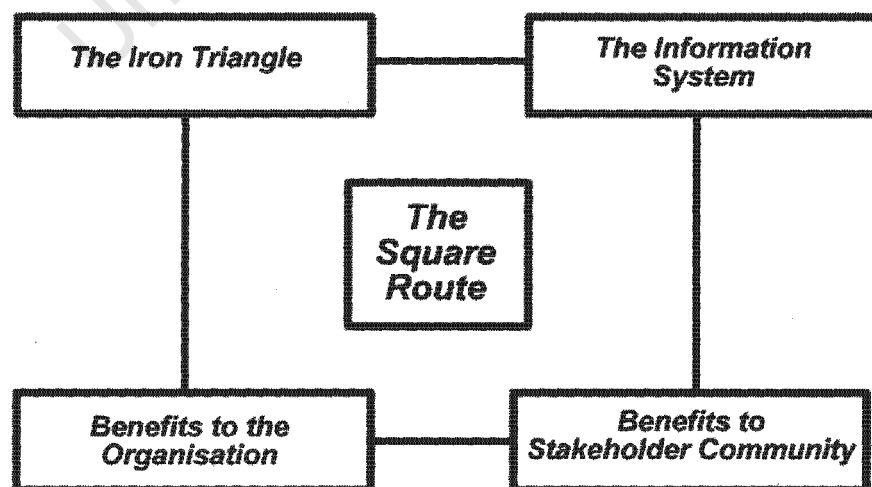


Figure 6: The Square Route (Atkinson, 1999)

Cooke-Davies (2004) describes three levels of success criteria. The first level focuses on project management success and asks '*whether the project was done right*'. This level equates with the traditional way of measuring project success, but is generalised so that the goal is to deliver the project and fulfil all its objectives within the given constraints.

The second level focuses on project success and asks '*whether the right project was done*'. The term "whether the right project was done" is, however, somewhat misleading. The main criterion of this level is to measure whether the project provides the benefits that are required by the stakeholders.

The third level looks at consistent project success and asks '*whether the right projects were done right, time after time*'. This level is concerned with providing repeatable performances of project success, and is in a way linked to the 'project management maturity model'.

Cooke-Davies (2004) goes on to say that each level of project success is successively harder than the previous level to achieve and is only measurable at a later date, and possibly in a less tangible form.

Bryde (2003) presented a model to assess the performance of project management called the project management performance assessment (PMPA), based on models used for assessing quality management. Similarly to Westerveld (2003), the model uses the EFQM business excellence model as a base upon which to build, and has two 'categories' of criteria – enablers and results.

The resulting model of (Bryde, 2003) has six areas within which to evaluate the performance of project management: PM Leadership, PM Staff, PM Policy and Strategy, PM Partnerships and Resources, Project Life Cycle Management Processes, and PM Key Performance Indicators (see figure 7). Each of the areas contains characteristics which indicate the level of performance a project manager (or organisation) provides.

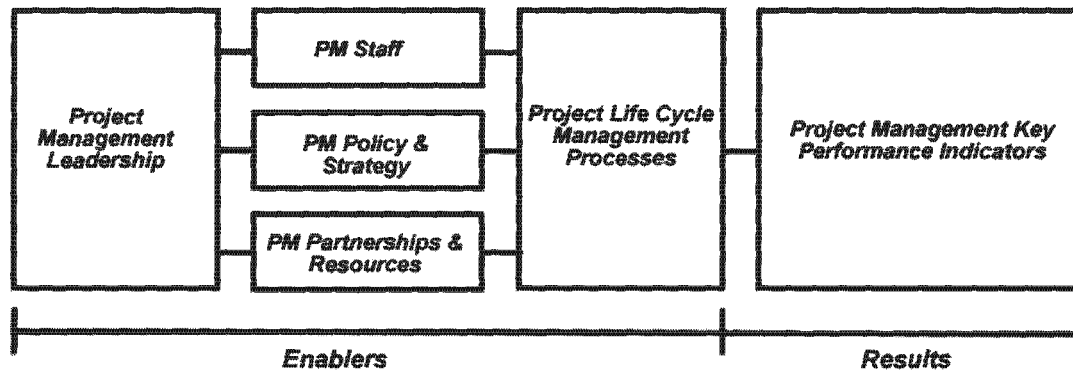


Figure 7: The Project Management Performance Assessment Model (Bryde, 2003)

This chapter has presented a sample of the academic literature surrounding project success from a wide range of sources in order to illustrate the breadth of approaches used to try and define and measure project success. It can be seen that each provides a different view on what project success is and how it should be measured, illustrating that there seems to be a lack of consensus surrounding this subject.

The next chapter focuses on the design of the research, including an overview of the methodology to be used, and the main research questions.

Chapter Three - Research Design

3.1 Nature of the study

In this research, 'Project Success' is considered as a concept rather than a variable, because a concept "is an idea expressed as a symbol or in words" while "a variable can be observed and measured" (Cavana, Delahaye & Sekeran., 2001).

The type of research involved in this thesis is descriptive. "Descriptive research deals with questions of *what* things are like, not *why* they are that way" (De Vaus, 2002), and attempts "to describe certain characteristics of the phenomenon on which interest rests" (Cavana et. al., 2001). Therefore, the purpose of this study is to further describe the concept of project success by comparing current thinking in the research literature versus practitioners on the topic of project success.

In the process of conducting this research, there were no dependant, moderating, intervening, or independent variables for direct statistical comparison. Rather, two conceptual frameworks are developed, compared, and discussed in order to further describe project success.

The first conceptual framework is developed from recent project success literature discussed in chapter 2. For the purposes of this research, the conceptual framework will represent current thinking among the project success literature. The second conceptual framework is developed by conducting a survey among information systems project managers. Again for the purposes of this research, the results of this survey will represent current thinking among information systems project managers.

3.2 Overview of Methodology

The research took place over two phases. The first phase analysed a sample of project success research articles in order to produce a combined conceptual model of how project management academics view the concept of project success. The combined conceptual model provided the means to begin to tackle the problem.

The second phase of the research used the conceptual model produced in the first phase of the analysis as input to develop a questionnaire. This questionnaire was then given to information systems project managers in order to obtain their viewpoint of project success.

The two viewpoints are then compared using qualitative techniques and basic statistical analysis to determine if there is a discrepancy, thus satisfying the research objectives of:

1. comparing industry perceptions of project success against current literature on project success.
2. comparing measures of project success used in the research literature versus those used by information systems project management practitioners.
3. attempting to obtain a combined viewpoint of project success and its measurement.

It could be viewed that using previous research as the basis for developing a conceptual model is a repetition of work, because the research is based on empirical evidence. However, not all the research presented has been empirically tested, and the combination of different models may provide different results. The focus on information systems project managers also adds a new dimension to the research.

3.3 Units of Analysis

There are two units of analysis involved in this research, one for each phase of analysis.

The first phase of analysis is qualitative and involves analysing textual sources. The unit of analysis for this first phase is the sentence (or a group of sentences if a concept spans more than one sentence).

The second phase of analysis involves analysing questionnaire responses. The unit of analysis for this second phase is the information systems project manager.

3.4 Time Horizon

The research in this study is cross-sectional, as opposed to longitudinal in nature, as its purpose is to study the understanding of concepts. The effects of time should not have any impact on this study.

3.5 Research Problem

This literature survey has highlighted the majority of research investigating the concept of project success, as well as the criteria used to measure the extent of this success.

The research problems can thus be summarised as:

- There is a lack of consensus concerning the definition of project success
- There is a lack of consensus concerning the measurement of project success

3.6 Research Questions

The research problem leads to the formulation of the research questions to be used in this research. Questions 1 and 2 seek to tackle the research problems presented above.

Question 1

The first research question tests the conformance of the concept of project success in practise to those dimensions defined in the conceptual model produced in the first phase of the analysis.

Do information systems project managers perceive the concept of project success in a way that is compliant with project success literature?

Question 2

The second research question seeks to compare the measures of project success in practise versus the measures proposed in the project success literature. The question is thus:

Do information systems project managers use success measures that are compliant with the measures proposed in the project success literature?

Question 3

The third research question seeks is presented as a matter of interest and is not related to a specific research problem.

This question seeks to find out what is the major factor that has shaped project managers viewpoint of the concept and measurement project success. Is project success viewed in a particular way because of the project manager's experience, because an assessment methodology is being imposed from a higher level, or because the method they are using was taught to them in their project management education?

The answer to this question will indicate what the best way to change the perceptions of project managers are. The question is thus:

Does experience, education and organisational viewpoint play a role in shaping a project manager's perceptions of project success?

The next chapter outlines in detail, the methodology used in the first phase of the research. This includes a look at the sampling and analysis approaches used in the research.

Chapter Four – Research Methodology (Phase One)

4.1 Overview

The first phase of the research used a qualitative methodology called content analysis to facilitate the analysis. This approach was used because it suited the type of data well. “Content analysis is the process of identifying, coding and categorising the primary patterns in the data” (Cavana et. al., 2001). The aim of using content analysis is to obtain trends and themes in the project success research literature. This produces a unified picture of project success, as seen by the project success literature.

The use of content analysis in information systems research is not new. For example, Gallivan, Truex and Kvansky (2004) used content analysis to analyse trends in required job skills for IT professionals by highlighting technology job types, skill sets and technology platforms in IT job advertisements over a period of time. Goo, Kishore and Raghav Rao (2000) used content analysis to develop a taxonomy of information technology and systems (ITS) outsourcing drivers, by qualitatively analysing 49 research articles. Tan and Teo (1999) used content analysis to understand the forces that influenced the diffusion of the internet in Singapore, by analysing messages contained in two local newspapers pertaining to the internet.

All of the above authors used content analysis because it provides a rigorous means for analysing textual sources (Cavana et. al., 2001).

Although it seems that an analysis of literature is a repeat of the literature survey, it should be noted that conducting this analysis produces a far greater insight, because of the increased level of granularity and methodological rigidity that such an analysis favours.

The main output of the content analysis is a group of themes or categories that describe current research thinking of project success. These themes together form a first ‘conceptual framework’. Two separate types of themes were identified early on in the analysis. The first types of theme were those concerning the understanding,

definition, or description of project success. The second types of theme were those concerning the measurement of project success (project success criteria).

The output of the content analysis produced many themes concerning project success. However, not all themes were sufficiently represented in the literature to be considered a strong viewpoint of project success. A theme was considered well represented if it occurred multiple times within and between articles. A system of simple counts as a representation of importance, as proposed by many content analysis authors, was dismissed. A single author espousing the same viewpoint numerous times within one article would falsely give weight to that theme. As such, no order or ranking of importance was assigned to the themes.

Thus, the output of the analysis is a collection of themes that can be said to describe the concept of project success, from the viewpoint of recent academic literature on the subject.

4.2 Sampling Approach

Since this research uses journal articles as a sample, some form of sampling approach was used to guide the researcher in article selection.

The concept of project success within the bigger project management body of knowledge has not been one of the more heavily researched topics. One explanation for this could be that the majority of past research has been focused at the practical (technical) level of project success. These papers have asked the question: *‘What are the processes necessary in order to efficiently manage a project?’*

A review of the first ten years of publications in the International Journal of Project Management (1983 – 1992) showed a heavy emphasis towards project management being considered a practical discipline rather than a theoretical one. Forty one percent of journal articles at this time related to insights into project management process, with only 15% and 20% being concerned with the presentation of new techniques and new models respectively (Betts & Lansley, 1995).

Morris (2001), in a study aimed at proposing updates necessary to the project management body of knowledge, reported that the trend still exists, with more research effort being spent on planning and monitoring than on technical and commercial topics. Morris (2000) also stated that “project management research has not been particularly oriented to demonstrating business relevance”, and that there is currently a disparity between “current research priorities and published research”.

Kloppenborg & Opfer (2002) reported on trends in project management research, and found that during the 1970's and 1980's, research focussed more on the procedural (technical) aspects of project management, while only moving into the softer issues in the 1990's.

A recent inventory of articles in the Project Management Journal and International Journal of Project Management showed only 3% (25) of articles published between 1990 and 1999 are directly related to project success criteria (Morris, 2000). In order to capture more recent thinking about project success, only articles written in the last six years (1998 and later) were selected for the study. One other pertinent article written before this time was included. Although this is not an exhaustive list, the majority of articles in the Project Management Journal and the International Journal of Project Management that deal with project success were surveyed.

An article qualified for inclusion if, the majority of the subject matter of the article was project success, the article gave a definition of project success that varied from the standard definition, and contained criteria or a framework for measuring project success.

A final sample of 11 articles was chosen. Not all of these articles focused on information systems project management, with some focusing on general project management (cross-industry), and others focusing on construction project management. This was done to obtain the knowledge generated by the other project management disciplines (see chapter 1).

Five of the articles chosen came from the International Journal of Project Management, and one from each of the following journals:

- International Journal of Quality and Reliability Management
- Journal of Performance of Constructed Facilities
- Project Management Journal
- Journal of Management in Engineering
- Long Range Planning
- International Journal of Operations and Production Management

The articles selected were:

- *An empirical investigation of project evaluation criteria* (Icmeli-Tukel & Rom, 2001)
- *Criteria of Project Success: an exploratory re-examination* (Lim & Mohamed, 1999)
- *The Project Excellence Model: linking success criteria and critical success factors* (Westerveld, 2003)
- *Project Management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria* (Atkinson, 1999)
- *Project Success: A multidimensional strategic concept* (Shenhar et. al., 2001)
- *The Role of Project Management in Achieving Project Success* (Munns & Bjeirmi, 1996)
- *Framework of Success Criteria for Design/Build Projects* (Chan et. al., 2002)
- *How can IS/IT projects be measured for success?* (Wateridge, 1998)
- *The Logical Framework Method for Defining Project Success* (Baccarini, 1999)
- *Project Success Index for Capital Facility Projects* (Griffith et. al., 1999)
- *Modelling Project Management Performance* (Bryde, 2003)

4.3 Analysis Approach

The steps used in conducting the content analysis were adapted from Cavana et. al., (2001). Firstly, a selection of appropriate articles on the subject was gathered (see

Sampling Approach). These articles were then read to obtain a general feeling for the subject matter. Each article was then obtained in an electronic format, using the electronic databases available at the University of Cape Town. If no pure text version of the article was available, the article was manually entered into a pure text format.

The pure-text versions of the articles were submitted to a content analysis software package called TextStat (available <http://www.niederlandistik.fu-berlin.de/textstat/software-en.html>), that extracted sentences that contained certain keywords. The preceding and following sentences were also extracted to provide a context for the use of the keywords.

A scheme of keywords was identified in the initial reading of the articles. The keywords considered pertinent to the research were those words whose root word contained: success, measure, definition, performance, and criteria. In this way, words such as measurement, successes, define, criterion, etc. were also identified. The articles were also manually read to extract any sentences that were applicable to the study, but did not contain any of the above keywords.

This collection of 'paragraphs' was then coded (each code included a source so that the source can be traced), and organised into themes. As themes emerged, they were compared with other existing themes to check for any overlap and similarities. Once a first pass of the coding was conducted, the text of each theme was transferred to a separate file. This file was then read to further understand the theme, as well as to look for sub-themes or inconsistent data. During the whole coding process, notes were taken to record any ideas or thoughts that occurred as a result of the coding.

The following chapter presents the analysis of the first phase of the research, along with a discussion of that analysis.

Chapter Five –Analysis (Phase One)

At the end of the analysis 10 themes emerged from the literature. These are presented and discussed under their individual headings below, in no particular order. It should be noted that all findings and comments pertain to the project success research analysed in this phase.

5.1 General Findings

One finding from the content analysis was that many of the authors who pronounced a lack of consensus surrounding project success, did not state what the scope of this lack of consensus was. Does it exist within the project success literature, the project management literature, or even the project management community as a whole?

However, despite these project success authors stating the lack of agreement/consensus/unified view, once the literature was analysed, a surprisingly consistent view emerged. There was a distinct lack of consistency in the language used. This could account for the why there seems to be a lack of consistency in the subject area.

Perhaps, this relatively consistent view can be explained by how research is conducted. A big step in the research process is to review past research in the subject area. When new research is conducted, past views and results are incorporated into the new product. This incremental approach is much like a process of ‘natural selection’ – ‘bad’ theory fails to survive leaving only ‘good’ theory. In a relatively small research area such as project success, there has not been enough work in the area for the theory to ‘evolve’ and form multiple contending theories, thus leaving a relatively consistent view in the subject area, with most authors including the same past research into their work.

A general idea that emerged is that, because of the complexities in measuring project success, there is no universal set of criteria that can be used. This leads to the idea that instead of setting out lists of criteria that are to be blindly applied by all project

managers to all projects, rather provide a guiding framework that helps project managers evaluate the success of their projects. Such a framework could help project managers choose criteria that are specific to their project, as well as provide guidance on when those criteria should be used.

5.2 Project Success Themes

1. The traditional method of measuring project success is inadequate.

This sentiment that traditional measures of project success are inadequate is perhaps most vehemently expressed by Atkinson (1999) with the title of his paper alone “Project Management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria”. However, many other authors also espouse this viewpoint.

“There are more, possibly competing, criteria that can be identified ... Perceiving project success simply as the compliance with time, cost and quality constraints can be qualified as a more ‘narrow’ view in this respect.” (Westerveld, 2003)

“However, project success should be something much more important than simply meeting cost, schedule and performance specifications.” (Chan et. al., 2002)

“To include only time, cost and specification as the only criteria is to simplify the definition.”
(Wateridge, 1998)

Despite this being recognised by project success authors as well as being published in mainstream project management journals, the traditional measures of “on-time, on-budget, and to-specification” are still being used by project managers and taught in the project management syllabus. The alternative viewpoint has not been subsumed into the general project management body of knowledge.

“It seems that we really should not judge project success according to the usual project goals alone, contrary to normal understanding of project management concepts.” (Lim & Mohamed, 1999)

“It has further been argued the literature indicates other success criteria have been identified, but to date the Iron Triangle seems to continue to be the preferred success criteria.” (Atkinson, 1999)

The argument that is being proposed is that these three measures alone do not convey enough information in order to properly judge whether a project is ~~as successful as~~ ^{meeting any} of these criteria, but still being considered a success for some reason (or vice versa). Atkinson (1999) likens using the three criteria to a Type II error. This is an error of omission instead of an error of commission.

“Research by Baker showed that in a post project analysis the successful accomplishment of time and cost objective were not considered of greatest importance in evaluating the ‘project success’.”
(Baccarini, 1999)

“However, there are instances where these three criteria have not been met and projects have still been perceived as successful.” (Wateridge, 1998)

“One of the most common approaches to project success has been to consider a project successful when it has met its time and budget goals. Although this may seem true in some cases—and appropriate in the short run when time to market is critical—there are many examples where this approach is simply not enough.” (Shenhar et. al., 2001)

“Projects can be product failures even when the project management success objectives of time, cost and quality have been successfully met.” (Baccarini, 1999)

There are further arguments that such strict focus on these three criteria alone is one of the causes of the high rate of project failure.

“The conclusion must inevitably be drawn that the fixation, on the part of project managers particularly, to satisfying timescale and budget constraints, at the expense of other criteria, is leading to the failure of IS/ IT projects.” (Wateridge, 1998)

“With such a narrow definition of project success, models of PM performance would exclusively focus on activities to ensure a project is managed to time/budget/specification.” (Bryde, 2003)

2. The different stakeholders of a project all have different views of the success of that project.

The second theme that emerged as a result of the analysis is that the different stakeholders involved in a project have differing views on what constitutes a successful project.

“Management must identify success measures prior to project initiation, and commit the organization’s resources to it.” (Shenhar et. al., 2001)

“The success criteria must be defined and agreed at the outset of the project, although this may be very difficult.” (Wateridge, 1998)

The project goal as a success measure was stated many times by different authors as a proposed measure of project success. The dictionary defines the word goal as “an aim or desired result” (Soanes; 2001). The project goal, if well stated, could serve as the tool which the project manager can use to align different stakeholders perceptions, in order to generate a list of agreed project criteria.

“Success criteria can conflict with each other, which means there will often be trade-offs that must be agreed by all parties before the project is started.” (Baccarini, 1999)

4. The outcome of the project (product) and the project management process are two separate entities, and as such should be measured for success in different ways.

The fourth theme that emerged from the literature was that of the separation of the two concepts of the project product, and the project management. Many authors argue that most reported results of project success relate only to the project management side of project success and neglect product success.

“In order to properly define and assess project success, a distinction should be made between product success and project management success, as they are not the same.” (Baccarini, 1999)

“Thus assessing project success would relate to both parts—performance during execution, as well as to success of the end result.” (Shenhar et. al., 2001)

The implication of conceptually separating these two concepts is that the measurement of the success of these two concepts should also be separated. Essentially the product of the project refers to the output or result of the project management activity. For most projects, this could be considered the goal of the project. The project management refers to the actual measurement of the process used to achieve the output.

“Having established this distinction between the project and project management it is possible to start to distinguish between success and failure of the two.” (Munns & Bjeirmi, 1996)

“Product success deals with the projects product and project management success deals with the project process.” (Baccarini, 1999)

“Importantly, the author proposes that it is common for project management literature to confusingly intertwine two separate components of project success – product success and project management success.” (Baccarini, 1999)

There is, however, a relationship between the two concepts. Project management success does not necessarily imply product success and vice versa. However, the product can still be a success without the project management being a success.

“This leads to a reference to the link between project and project management success.” (Munns & Bjeirmi, 1996)

“A project may provide an efficient solution to a customers requirements, yet be considered as a failure by the performing organization in terms of business success.” (Shenhar et. al., 2001)

“A project to develop a particular package (for example, an accounting system, a payroll system) may be delivered on time, to specification, to budget, it satisfies the need of all interested parties but the system may not be a commercial success or it may not be profitable and consequently it will be judged as unsuccessful.” (Wateridge, 1998)

Breaking project success into component parts simplifies the task of establishing some kind of measurement standard. In order to measure these two separate entities requires some kind of benchmark or guideline.

Measuring the output of the project requires some industry specific knowledge about what is being produced. For the information systems industry, one could look at the academic literature on information systems success. One of the most prominent models is the Delone & McLean Model of Information Systems Success (Delone & McLean, 1992; Delone & Mclean, 2002)

In terms of the project management process, a large amount of literature exists in explaining how a project should be managed. One of the foremost is the Project Management Institute’s Guide to the Project Management Body of Knowledge.

Two such sources could be used to build a framework of project success that is founded on a strong base of research and well accepted sources within the project management and academic communities. Such a framework could serve as a guide for determining how to assess the success of a project instead, as well as prove more flexible than just providing a prescriptive list of criteria that should be applied to all projects.

5. Project success contains mainly subjective (soft) as opposed to objective (hard) measures.

A misconception that many of the project success authors pointed out is that project success can be measured objectively by using tangible criteria to produce a definitive answer. However, project success authors view measures of project success as both soft subjective criteria and hard objective criteria. The type of measures used, however, is somewhat dependant on the product that is being produced and again brings in the aspect of product specific measures according to industry.

“The criteria for a construction project in general can be classified under two main categories, one being hard, objective, tangible, and measurable, and the other soft, subjective, intangible, and less measurable.” (Chan et. al., 2002)

“The ‘soft’ success criteria refer to such aspects as happiness, job satisfaction, enhanced reputation, and attention to detail.” (Baccarini, 1999)

“Briner et al. classified the criteria has either 'hard' (tangible and quantitative) or 'soft' (intangible and qualitative).” (Wateridge, 1998)

“A comprehensive literature review indicates that the criteria for project success can be divided into objective and subjective categories, with time, cost, quality, and satisfaction the most significant measures.” (Chan et. al., 2002)

The use of subjective measures is especially prevalent in the information systems industry where requirements specification is far from an exact science. Measures such as perceived success of the system, usefulness of the system, and perceived satisfaction are difficult, if not impossible to measure. The same problem could be

said to exist in the construction industry where aesthetic appeal, and functional layout, mean different things to different people.

However, the more exact the requirements specification, the more objective the measures of project success become. A specification that states that the product is to produce x parts per minute is much easier to measure than a specification that states that the product must satisfy the user.

“Hard criteria are relatively easy to gauge and to reach some degree of consensus.” (Baccarini, 1999)

“Many of the project objectives will tend to be either qualitative and not easily measured in any objective manner, or longer-term and not measurable immediately.” (Munns & Bjeirmi, 1996)

As a result of this, there is the possibility that the mis-measurement of project success has pervaded for so long because of the difficulty in measuring soft criteria of project success.

6. There are multiple dimensions to project success.

Many of the project success authors propose that there are multiple dimensions of success. However, most fail to define what a dimension is and what distinguishes one dimension from another dimension.

The dictionary defines a dimension as: “an aspect or feature” (Soanes; 2001). This could then be taken to mean that project success, can be further subdivided into smaller parts. Multiple dimensions have been proposed by project success authors. Different dimensions would also be more important for different types of projects. These different dimensions would each contain different criteria, and be measured at different phases of the project lifecycle.

“This idea influenced the introduction of multi-dimensional frameworks for the assessment of project success which would reflect different interests and different points of view.” (Shenhar et. al., 2001)

“In this article, we propose to classify the perspectives of project success into two categories: the macro and micro viewpoints.” (Lim & Mohamed, 1999)

“They must look both at the short-term and the long-term benefits of the project, judging its performance on the outcomes of all dimensions.” (Shenhar et. al., 2001)

“At the same time, research was also focusing on establishing which dimensions of project success were most important” (Bryde, 2003)

“Developments in the PM discipline suggest that new models of PM performance need to reflect the “multi-dimensional/multiple-stakeholder/quality of process as well as product” paradigm for defining success.” (Bryde, 2003)

“Based on the previous literature and our own observations, we, too, have perceived project success as a multidimensional concept, and our objective was to see what are the specific dimensions that make sense for different kinds of projects.” (Shenhar et. al., 2001)

“For example, Cooper and Kleinshmidt identify three dimensions for measuring product success: financial performance, opening new opportunities, and market impact.” (Baccarini, 1999)

Again, viewing project success by different dimensions breaks down the ‘difficult to tackle’ concept of project success, and provides a guiding framework from which to understand and assess project success.

7. Each project should have unique success criteria

The main proposition of this theme is that not all criteria are suitable for all types of projects.

“Following this line of thought, our research leads us to contend that for project success, as well, “one size does not fit all”—different success dimensions are relevant to different types of projects, and in different degrees of importance.” (Shenhar et. al., 2001)

“However, it is clear that different criteria will be important on different projects.” (Wateridge, 1998)

“Assuming that while criteria defining project success can be different for each project, a universal clustering of criteria can be formulated to cover the whole issue of project success.” (Westerveld, 2003)

“Other researchers in the area of project management should conduct similar research investigating the measurement of project success focusing of different types of projects.” (Griffith et. al., 1999)

Because not all criteria are suitable for all projects, we need to be able to determine what the factors are that cause criteria to change between projects. Assuming projects of a similar structure (size, duration, technological uncertainty), one could argue that

the management (or the tools and techniques used in managing a project) does not change between projects. A project manager, to a certain extent, will always follow the same process in managing a project.

Thus, given the separation of the concepts of project management success and product success, one could argue that the changing factor in all projects is the type of product being produced. This leads to the assertion that the major factor that changes between projects is the product. Thus one can assume that different products require different success criteria.

“Is there more than one way to evaluate project success, and should the same rule apply to all projects?” (Shenhar et. al., 2001)

“Success criteria will differ from project to project depending on a number of issues, for example, size, uniqueness and complexity.” (Westerveld, 2003)

“Therefore, there may a different weighting of criteria on each project.” (Wateridge, 1998)

8. Project success is an abstract concept that lacks a standardised definition, and is difficult to measure.

This theme is included in most project success articles as an introduction to highlight the plight of project success research. The project success authors then proceed to highlight how important the discussion of project success is, and then proceed to propose their ‘brand’ of meaning on project success. However, at the time of this research, there was still no standard definition of meaning or measurement of project success despite lengthy discussions of the characteristics of project success.

“Project success is an abstract concept, and determining whether a project is a success or a failure is far more complex.” (Chan et. al., 2002)

“When the question of criteria of project success was addressed to the interviewees, opinions were found to be split.” (Lim & Mohamed, 1999)

“The only consensus seems to be that project success is a complex and dynamic concept that cannot be measured with a simple test like the slump of a concrete mix.” (Griffith et. al., 1999)

“McCoy observes that a standardized definition of project success does not exist nor an accepted methodology of measuring it.” (Baccarini, 1999)

Many authors point out the need for some kind of guiding framework that project managers can use to assess their projects, and compare results between projects.

“Despite the complexities involved, project management researchers and practitioners need a method of measuring project success based on factual project data that enables the results from different projects to be compared.” (Griffith et. al., 1999)

“Ironically, however, the project management literature has been slow to adapt to similar concepts, and there is no agreement on a standard, or even an operative framework for assessing project success.” (Shenhar et. al., 2001)

9. There is a hierarchy of project success criteria, with some criteria being more important than others.

Another strong theme that emerges from the literature is that not all criteria should be given an equal weighting when judging the success of a project.

“Product success is of a higher order and ultimately is of greater importance.” (Baccarini, 1999)

“This arises because of the project management criteria being a subset of all project criteria.” (Munns & Bjeirmi, 1996)

“While the new framework itself takes all success criteria into consideration, different perspectives may have different success priority.” (Chan et. al., 2002)

The main reason for proposing different levels of project success is that a project manager is always dealing with limited resources. As such, it is not possible to focus all attention equally on all objectives. However, since not all objectives are equally important, the project manager needs to know which ones he/she needs to focus on.

“In special case like this, the completion criterion would fade into insignificance and there will be only one criterion left: satisfaction.” (Lim & Mohamed, 1999)

This implies a need for the definition of a hierarchy of project objectives to be stated at the outset of the project, in terms of the project goal. A hierarchy of project objectives would indicate which objectives need to be emphasised over others, and in

the event of conflicts, which would take precedence. Similarly, success criteria should be given a ranking that indicates the importance of each criterion so that in case of conflicting objectives or trade offs, it is clear in which direction the project manager should focus.

“In many projects there will be a large number of stakeholders, in which there is a need to identify which stakeholders are going to have the most influence in determining project success.” (Baccarini, 1999)

“For example, PM performance might focus on delivering a project within budget, yet if the overriding success criterion, or key performance indicator (KPI), for the project is delivering future benefit to the organisation, “successful” PM performance will not necessarily lead to the project being viewed as a success in the long term.” (Bryde, 2003)

This theme ties into the theme of different success criteria for different projects, as well as the theme of stakeholder agreement. Such a hierarchy of project success criteria would be different depending on the project goal, and would need to be agreed upon by all project stakeholders.

For example, in a project where the product is to be given to an external client, the success of the product should be of higher importance than the success of the project management. Conversely, in a new product development project, the success of the project management, particularly time, is of greater importance than the product.

10. Project success is not measured only once at the handover phase of the project, but at multiple times during different phases of the project.

The traditional view of project success indicates that project success be measured once, when the project manager hands over the project to the client. At this point, the project manager gets evaluated on his/her performance according to traditional criteria. However, most project success authors pronounce that project success should get measured at multiple times during different phases of the project, using different criteria.

“To assess a project’s success, one needs to understand the distinct dimensions and address different timeframes—from very short to very long.” (Shenhar et. al., 2001)

“Each success criterion has its own timescale for measurement.” (Baccarini, 1999)

“However, project success is a very complex concept that actually changes over time” (Griffith et. al., 1999)

“This limits the criteria for gauging success to the Iron Triangle and excludes longer term benefits from inclusion in the success criteria.” (Atkinson, 1999)

It seems that measurement of project success using traditional criteria continues because at this stage of the project, this is all that there is. The user has just started using the product, and not much time has passed since the project has been completed. So many (if not all) of the product completion criteria cannot be determined yet. The project team is about to be disbanded and upper management want a performance report. So traditional criteria are used because of a lack of other criteria.

“Therefore, it is convenient to judge success at this time by whether the project management criteria have been satisfied rather than the project criteria.” (Munns & Bjeirmi, 1996)

Such well intended activities could lead to poor project management performance because of senior management evaluating the project manager on traditional criteria, at a time when additional success criteria are not available. This forces the project manager, as a self-defence mechanism, to focus more on the project management and less on the product of the project, leading to users who are unhappy with the result of their projects.

“During the planning (consisting of conceptual and development stages) and termination stages project managers are customer focused although during the implementation stage they give priority to meeting internal measures of time, cost and performance.” (Icmeli-Tukel & Rom, 2001)

In broad terms, the success of the project management should be measured once the project is complete and the success of the product once the project has reached the end of its useful life. In the majority of cases this would be infeasible as the useful life of a product sometimes spans decades. In such cases it could be recommended that the product be evaluated once the user has used the product for some time and is comfortable with it.

A sub-theme of this theme is that project success is not a discrete measure, but a continuous one. In other words, a project is not either a success or a failure, but can achieve results in-between. The Standish Group, in their Chaos Report (2001), included one extra category in their analysis of the results of project outcomes by including a category called a challenged project. This is a step in the right direction, but possibly a higher level of granularity is what project success authors refer to.

5.3 Summary of findings

A summary of the findings is presented in four characteristics of project success:

- Project success is an abstract concept that lacks a standard definition, and is difficult to measure. The traditionally used measures of cost, time and specification do not adequately measure the success of a project.
- Different stakeholders have different views of what constitutes a successful project. Thus success criteria should be defined and agreed upon at the beginning of the project, and split into a hierarchy of importance.
- The measurement of project success should be split into multiple dimensions. Among these dimensions, it should be noted that the outcome of the project and the project management processes should be measured separately, and that project success should be measured at different intervals of the project lifecycle.
- Each project requires unique success criteria, but should include soft subjective criteria included when measuring project success.

5.4 Success Measures

While the above analysis was being conducted, a list of project success criteria mentioned by authors was developed, using a similar process of content analysis. These measures were extracted and placed in a separate file for later analysis. Each

entry was coded to prevent different word usages to obscure counts. This process followed more traditional content analysis procedures since no interpretation of the data was necessary.

The output of this process was a list of the most frequently mentioned measures found in the project success literature. A measure was only included if it was used in the context of being recommended as a criterion to measure project success. Many measures were stated only once or twice with no further explanation provided. As such these measures were omitted from the list. A final analysis produced a list of the nine most frequently mentioned measures of project success in the project success literature. The list of top occurring measures is:

1. Conformance to time schedules
2. Conformance to budget schedules
3. Conformance to functional specifications
4. Quality
5. User satisfaction
6. Satisfaction of other stakeholders
7. Actual product use
8. Business benefit
9. Project goal achievement

Surprisingly, given the subject matter, the traditional measure of time, cost and technical specifications were the three most frequently mentioned measures of project success. It is important here to note that a measure was only included if it was mentioned in a manner that proposed its use for project success.

Quality was another frequently mentioned measure. However, quality poses a problem in that again there is no standard of quality as it applies to project management. Also, the authors failed to distinguish between quality of the project management process and quality of the product.

Another of the frequently occurring measures of project success is User Satisfaction. One frequently used argument is that the only true way to tell that a project is a

success is if the users are satisfied. This point of view neglects to take into account the viewpoints of the sponsoring organisation, and the project team, who in some regard should have a say on whether the project is a success. This also goes against the characteristic of project success that says that all stakeholders should be in agreement with a project's success criteria at the outset of a project.

Interestingly, the majority of these measures are present in the Delone & McLean (1992) model of Information Systems Success. The figure below shows the revised Delone & McLean (2002) model of Information Systems Success. The only measures that are not present are the project management related ones (conformance to time, budget and functional specifications, satisfaction of other stakeholders, and achievement of project goal).

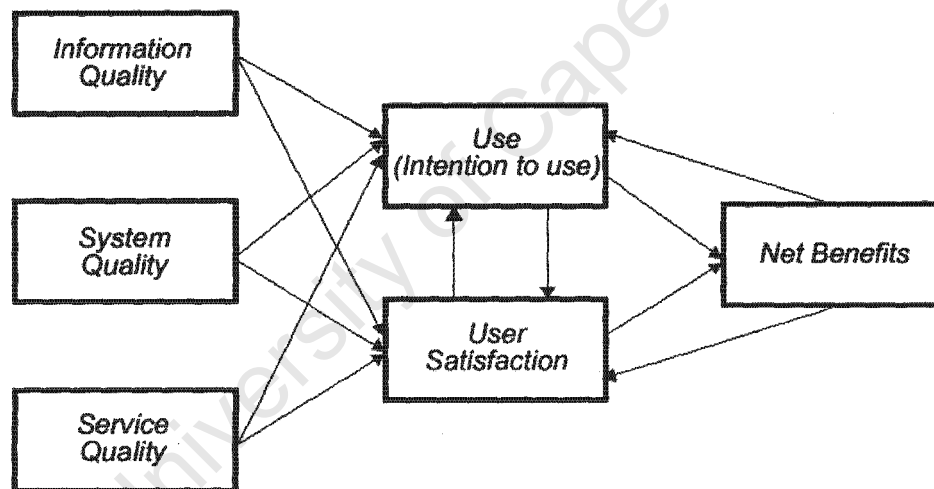


Figure 8: Revised model of information system success (Delone & McLean, 2002)

A possible guideline for measuring project success is to have three categories of measures. The first dealing with internal measures of project management success, the second dealing with measures specific to the product being produced (Such research is already available in the IS industry. See Delone & Mclean (1992) and Saarinen (1996) for examples of literature relating to information systems success) and the third relating to the value the project provided to the business.

The next chapter presents the methodology used in the second phase of the research.

Chapter Six – Research Methodology (Phase Two)

The second phase of the analysis used a qualitative methodology approach, using basic descriptive statistics to facilitate the analysis. A target sample of information systems project managers was used for two main reasons. Firstly, most project managers should have been exposed to project management literature, either through self enrichment or education, and therefore should have had some exposure to academic thinking of project success and its measurement. Secondly, project managers were easier to access than users or sponsors, and possibly more willing to take part in the research because they could directly benefit from the results.

An electronic survey questionnaire was chosen as the means of data collection. This method was chosen to facilitate an impartial data collection process, ease of questionnaire distribution, automatic data collection and, immediate questionnaire validation.

Two main sampling frames were approached, the Project Management Institute South Africa's Western Cape chapter, and current and previous graduates of the Faculty Training Institution (which focuses on IT project management education).

A brief description and link to the questionnaire was placed on the Project Management Institute South Africa's Western Cape chapter newsletter. The second sample also received an email with a description of the research and a link to the questionnaire. Along with this, several other organisations in the information systems industry were contacted privately and asked to participate in the survey.

The sample can thus be characterised as Information Systems Project Managers in the Western Cape. Given the nature of the sample, there is no reason to think that the results of the study cannot be generalised to South Africa as a whole, and perhaps internationally as well.

The results of the analysis from phase one was used to design the questionnaire consisting of four sections (See Appendix A for full questionnaire). A pilot study was

conducted, where eight project managers were asked to complete the questionnaire in order to assess the time taken to complete the questionnaire, any spelling and grammar errors, respondents ease of understanding of the items, and any other flaws not yet encountered. The responses from this pilot study were used to fine tune the questionnaire.

Section one of the questionnaire recorded biographic details of the respondents. The first question recorded the degree of project management education the respondent had. Possible answers were: a university degree, professional qualification, a diploma course, a certificate course, a short course, and none. More than one option was allowed. The second question recorded the amount of project management experience the respondent had. Respondents were asked to select the category into which they fell, with answers ranging from 0 to 15 years split into 5 categories representing significant levels of project management experience.

All questions from section two onwards were presented using a 5-point Likert scale. This scale was chosen so that the data collected was of an interval scale, and could be easily translated into numerical values. An interval scale makes it possible to perform arithmetic operations and basic statistical procedures on the data (Cavana et. al., 2001).

The second section investigated project managers understanding of the concept of project success. Ten questions were asked, each one corresponding to a major theme of the first phase analysis. Respondents were asked to evaluate the extent to which they agreed with each statement. The answers were recorded on a five point Likert scale, with possible answers ranging from Strongly Disagree to Strongly Agree. During pilot testing, it was found that respondents tended to answer positively to all questions in the section. As a result, a few of the questions were phrased in the negative to prevent respondents from automatically selecting the option that looked right.

Section three of the questionnaire investigated the measures most used by project managers in assessing the results of their projects. Respondents were asked to indicate how often they used each of the measures presented. Ten measures were presented,

each one corresponding to a measure found in the results of the first phase analysis. Answers were recorded on a five point Likert scale, with possible answers ranging from Never to All Of The Time.

Section four investigated the major factors influencing the answers of the respondents in the previous sections. Respondents were asked to respond on a four point Likert scale, with answers ranging from No Role At All to Extremely Large Role. A middle answer was not provided in this section to prevent neutral answers.

The questionnaire was submitted for an Ethics Committee review before being posted on the university web site. The survey ran for a month, during which a total of around 500 potential respondents were contacted. Out of this total sampling frame, 40 responses were collected, representing a total response rate of 8%. The data was collected directly in a password protected access database on the Commerce Faculty web server, and automatically coded upon capture. All responses were considered as anonymous, and no information that could identify the respondent was stored.

The next chapter presents the analysis for the second phase of the research, for each of the research questions.

Chapter Seven –Analysis (Phase Two)

7.1 Preliminary Data Exploration

The analysis was conducted with the sample of 40 project managers using a combination of Microsoft Excel and Statsoft Statistica. Underhill & Bradfield (1996) and Van den Honert (1999) were used to reference statistical procedures.

Preliminary data analysis revealed that two of the responses were considered to be incorrectly completed. These two incorrect responses were eliminated, resulting in a total of 38 responses being used for the analysis. Although this sample could be considered small, it is sufficient for an exploratory, descriptive study such as this one as the chi-square test does not require big samples.

The data in section 1 was first analysed using descriptive statistics. Section 1 of the questionnaire collected demographic information of the sample according to the level of project management education, and the level of project management experience of the respondents. Figure 8 shows the experience profile of the sample.

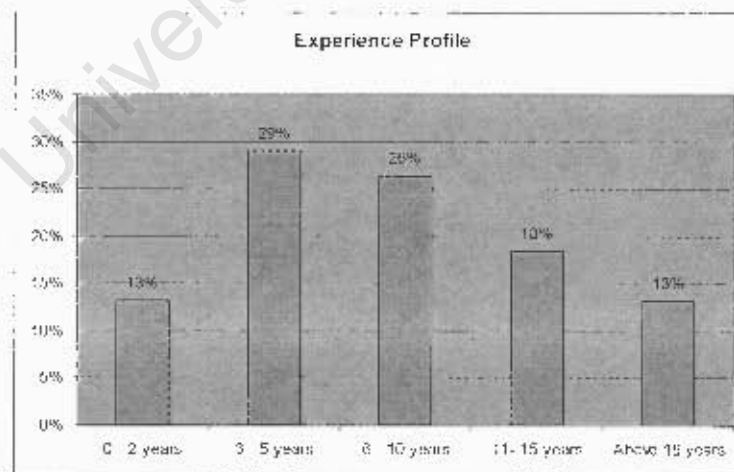


Figure 8: Experience profile of the respondents

The majority of the respondents had between 3 and 5 years of experience, but more than half (57%) had a level of experience of 6 years and over. The sample could thus be considered to represent a substantial level of experience.

When looking at the level of project management education of the sample (see figure 9), it is apparent that the majority of project managers obtained their project management education from a project management module within their university degree, or a diploma course in project management. Only a small percentage had any professional project management qualifications. Note that figure 9 shows only the highest level of project management education attained.

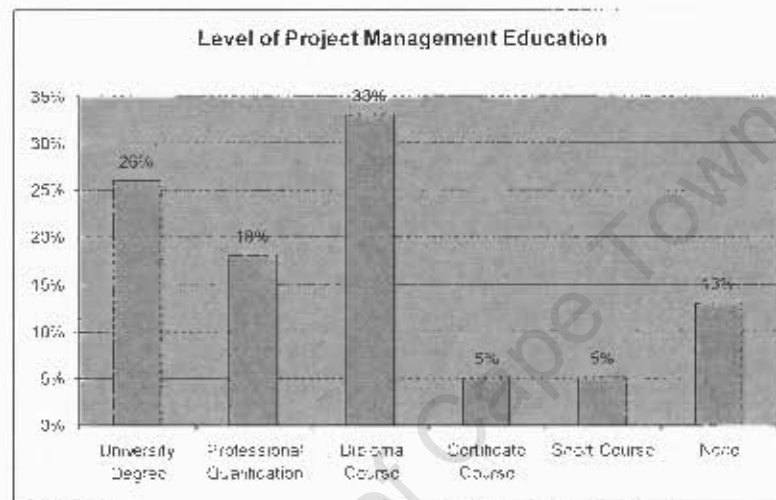


Figure 9: Education profile of the respondents

7.2 Analysis

The chosen method of analysis utilised the chi-square statistic to test for a difference between the project success literature and the sample of project managers. The chi-square test uses observed frequencies obtained from the sample, and tests these against expected frequencies. If the difference between the observed and the expected frequency is too large, the test is significant and the null hypothesis is rejected. In the case of the chi-square test, the null hypothesis is that the observed and expected frequencies are the same, whereas the alternate hypothesis is that the observed frequencies are not the same.

For each question, the frequencies of each response were obtained (the number of responses for each of the five options). The options for strongly agree and agree were combined, as well as the options for disagree and strongly disagree. This resulted in a set of three frequencies for each question, the amount of people that 'agreed', the

amount of people that were 'undecided', and the amount of people that 'disagreed'. Since questions 3, 4 and 5 were worded in the opposite direction than the rest of the responses, these values were reversed for the analysis.

For each of these categories, an expected frequency was produced. The expected frequency was used as a proxy for an indication of agreement. From the results of phase one of the analysis, the majority of people would be expected to agree with each question, a few would be expected to disagree, and even fewer to remain neutral. However, the term *majority* is not a clearly defined one, and can technically be considered anything above 50% of the sample, but more likely considered to mean anything above 75%.

The proposed value for the expected value of agreement was set at 80% agreement, 15% disagreement 5% undecided. A sensitivity analysis was done at 75%, 20%, 5% and 85%, 10%, 5% to see whether a small change in these values would materially affect the results of the research. The results of the sensitivity analysis showed that the results of the analysis would remain the same if these values changed, and the levels of 80% agreement, 15% disagreement, and 5% undecided were kept.

These frequencies were then compared against the frequencies obtained from the questionnaire using the chi-square test, in order to obtain a test statistic. This test statistic was then compared to a critical value of 9.21, which represents a significance level of 1% with two degrees of freedom. This significance level was chosen to enhance the accuracy of the results, and catch any errors that might be as a result of using the expected values chosen above. If the test statistic exceeded the critical value, the hypothesis was rejected and the viewpoint of the project managers differed from that of the literature.

As well as using the chi-square test, a histogram of responses for each question was used in order to get a better view of the dispersion of the data.

7.3 Research Question 1

Do information systems project managers perceive the concept of project success in a way that is compliant with project success literature?

The aim of the first research question was to discover whether project managers had a view of project success that was in line with that of the project success literature. This was done by comparing each of the eight characteristics of project success found in the first phase of the analysis to what was found in the survey.

1. The traditional method of measuring project success is inadequate.

The responses to this question had a mean value of 3.0, with responses varying across the full range of the Likert scale. This equates to a mean response of “*Neither Agree or Disagree*”. The result of the chi-square produced a test statistic of 25.28, which is greater than the critical value of 9.21. The response from the sample is thus different from that of the research. This would indicate that there is still a strong disagreement in the IS project management community about whether or not the traditional method of measuring project success is adequate. The result mirrors the contention in the project success literature, with a lot of researchers still using the traditional definition of project success.

Figure 10, shows a histogram of the recorded values. It shows that even though 47% of respondents agree that the traditional measures of project success are inadequate, 52% of the respondents disagree or are undecided. The wide range of responses throws disagreement on this particular characteristic.

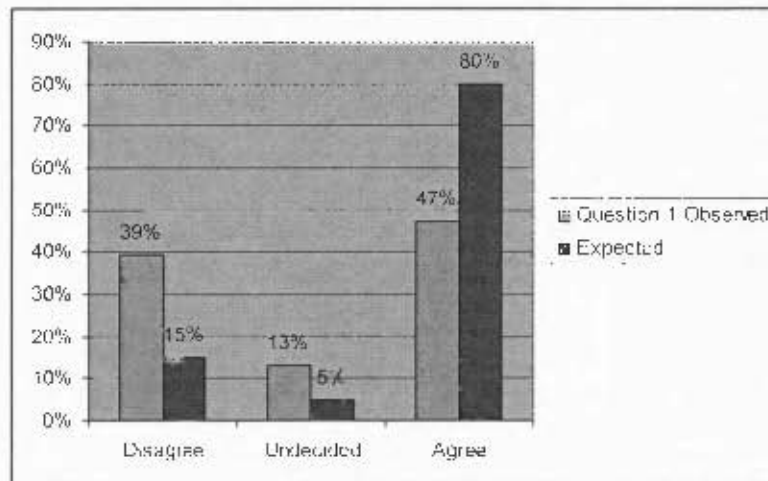


Figure 10: Histogram of responses for question 1.

2. The different stakeholders of a project all have different views of the success of that project.

The responses to this question had a mean value of 3.6, again with responses varying across the full range of the Likert scale. This equates to a mean response of Agree. The result of the chi-square produced a test statistic of 1.12, which is less than the critical value of 9.21. The response from the sample can thus be considered the same as that of the project success research. This would indicate that project managers agree that different stakeholders of a project perceive project success differently.

A closer look at the data in the graph below concurs with this view. The observed frequencies match the expected frequencies extremely closely.

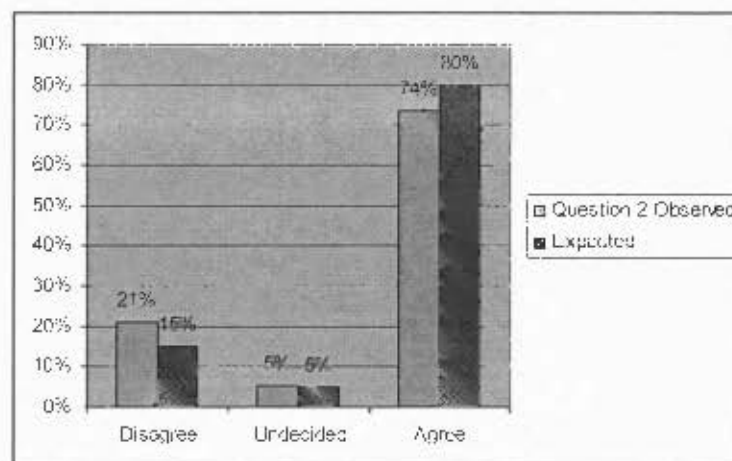


Figure 11: Histogram of responses for question 2.

3. The outcome of the project (product) and the project management process are two separate entities, and as such should be measured for success in different ways.

The responses to this question had a mean value of 3.7, again with responses varying across the full range of the Likert scale. This equates to a mean response of Agree. The result of the chi-square produced a test statistic of 5.33, which is less than the critical value of 9.21. The response from the sample can thus be considered the same as that of the project success research. This would indicate that project managers agree that the success of the product should be evaluated separately from the success of the project management process.

A closer look at the data in figure 12 concurs with this view. However, it should be noted that there is still some disagreement, with a quarter of the sample disagreeing with the statement. Interestingly, there wasn't a single respondent who was unequivocal (placed an answer of 3 – Neither Agree or Disagree) on this question.

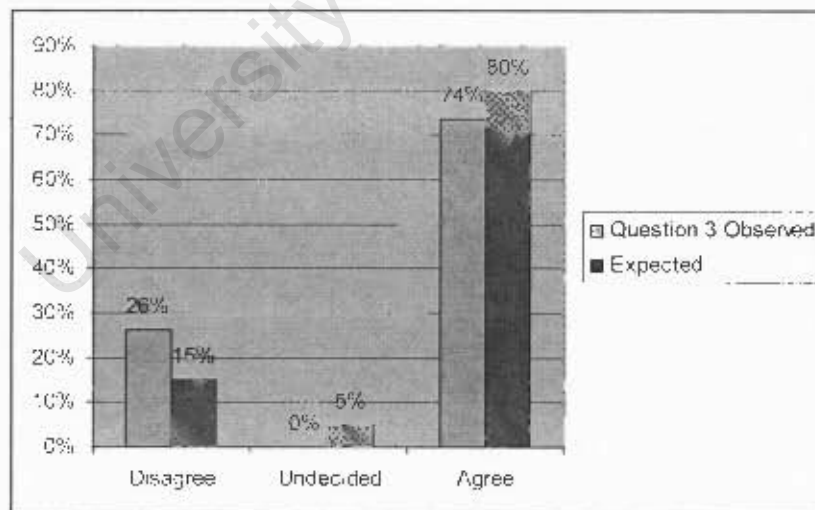


Figure 12: Histogram of responses for question 3

4. Project success contains mainly subjective (soft) as opposed to objective (hard) measures.

The responses to this question had a mean value of 2.8, again with responses varying across the full range of the Likert scale. This equates to a mean response of Neither Agree or Disagree. The result of the chi-square produced a test statistic of 61.94, which is much greater than the critical value of 9.21. The response from the sample is thus different from that of the project success literature. Again this would indicate that there is some disagreement among project managers, about whether project success contains mainly hard or soft measures of success.

A closer look at the data in the graph below shows that although 53% of project managers in the sample disagreed with the statement, the other 47% either agreed or chose to place an ambivalent answer. There is not enough evidence, however, to give a conclusive answer.

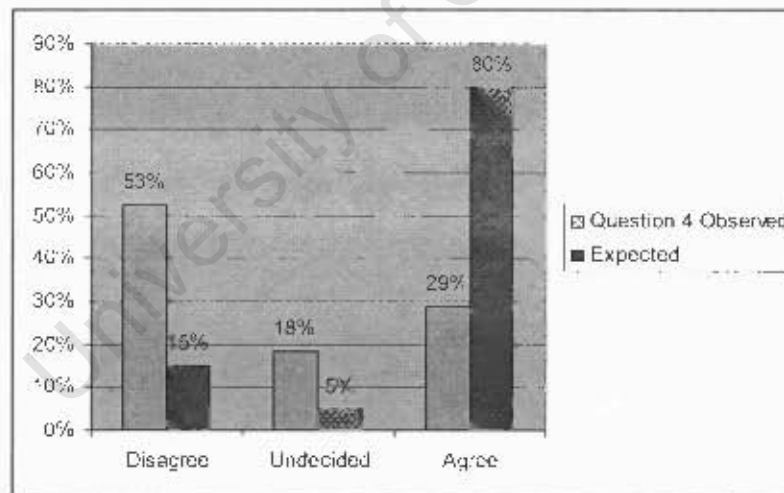


Figure 13: Histogram of responses for question 4

5. The success criteria of a project should be defined and agreed upon at the beginning of the project.

The responses to this question had a mean value of 4.6, with responses ranging from 2 to 5. This equates to a mean response of Strongly Agree. The result of the chi-square produced a test statistic of 7.21, which is less than the critical value of 9.21. The

response from the sample is thus in agreement with the project success research literature. This indicates a strong sentiment of agreement that the success measures of a project should be defined and agreed upon at the beginning of the project.

A closer look at the data in figure 14 shows a very strong sentiment, with only 3% of sample disagreeing with the statement, and none of the respondents placing an unequivocal answer.

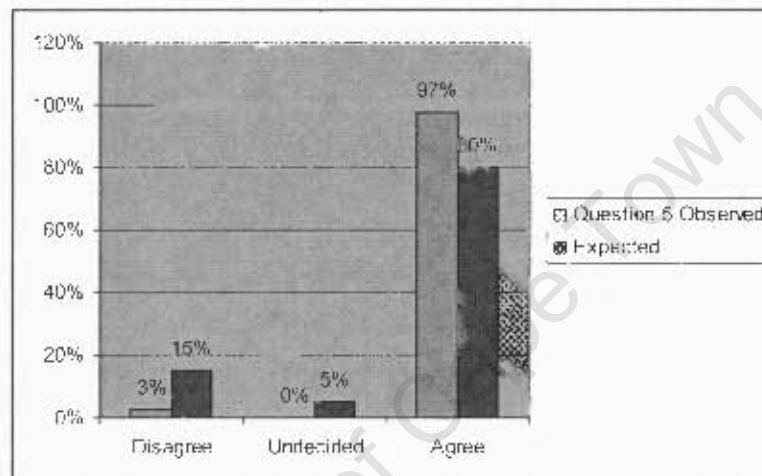


Figure 14: Histogram of responses for question 5

6. There are multiple dimensions to project success.

The responses to this question had a mean value of 4.4, with responses varying between 3 and 5. This equates to a mean response of Strongly Agree. The result of the chi-square produced a test statistic of 6.73, which is less than the critical value of 9.21. The response from the sample is thus the same as that of the research. Again there is a strong sentiment of agreement with the statement that there are multiple dimensions to project success.

A closer look at the data in the graph below clearly shows this strong sense of agreement with the statement, with no respondents disagreeing with the statement.

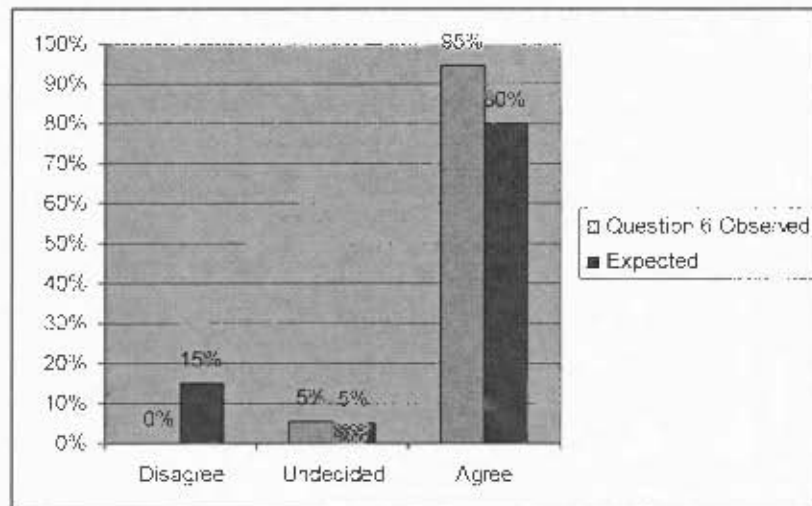


Figure 15: Histogram of responses for question 6

7. Each project should have unique success criteria

The responses to this question had a mean value of 4.1, with responses ranging between 2 and 5. This equates to a mean response of Agree. The result of the chi-square produced a test statistic of 1.5, which is less than the critical value of 9.21. The response from the sample is thus the same as that of the literature. This indicates that project managers agree that each project should have unique success measures.

A closer look at the data in figure 16 concurs with this view.

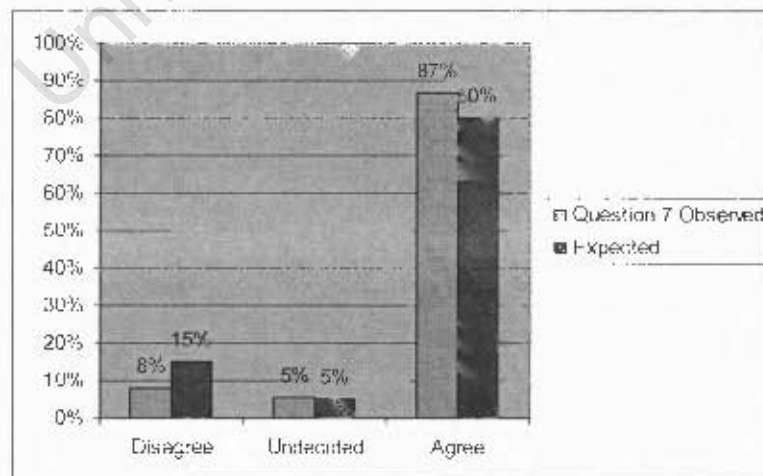


Figure 16: Histogram of responses for question 7

8. Project success is an abstract concept, that lacks a standardised definition

The responses to this question had a mean value of 2.2, with responses varying from between 2 and 5. This equates to a mean response of Disagree. The result of the chi-square produced a test statistic of 119.017, which is greater than the critical value of 9.21. The response from the sample is thus different from that of the project success research literature. This result is in direct contradiction of project success literature, i.e. that the concept of project success is not well defined and understood by the project management community.

A closer look at the data in figure 17 supports the view, with almost three quarters of project managers disagreeing with the statement.

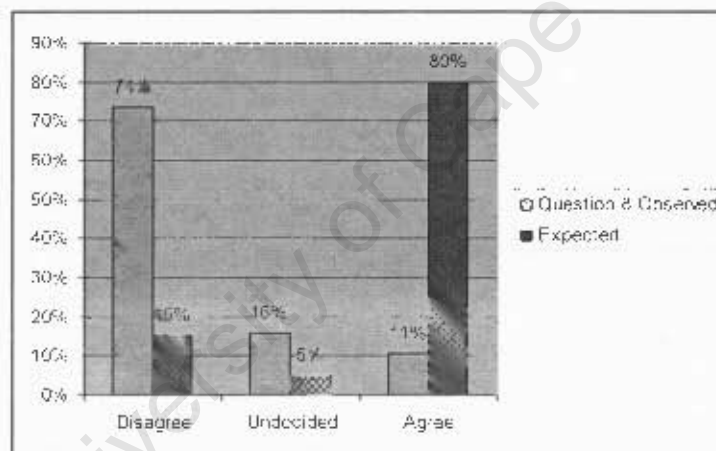


Figure 17: Histogram of responses for question 8

9. There is a hierarchy of project success criteria, with some criteria being more important than others.

The responses to this question had a mean value of 3.7, with responses varying across the full range of the Likert scale. This equates to a mean response of Agree. The result of the chi-square produced a test statistic of 2.47, which is less than the critical value of 9.21. The response from the sample is thus the same as that of the project success research literature. This indicates that project managers agree that not all success criteria are of equal importance.

A closer look at the data supports this view, with 76% of respondents agreeing with the statement.

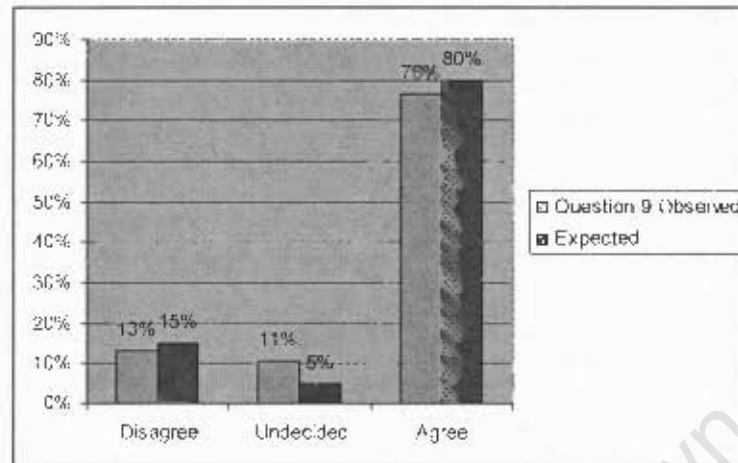


Figure 18: Histogram of responses for question 9

10. Project success is not measured only once at the handover phase of the project, but at multiple times during different phases of the project.

This question asked respondents to mark at which phase of the project they measured project success. As such its analysis requires different handling. Here, a simple measure of counts indicates when the success of a project is most measured. The graph below shows that most project managers tend to measure the success of the project at implementation and hand over, followed by project close down, and post project close down. However, the essence that project success gets measured at different phases of the project is shown.

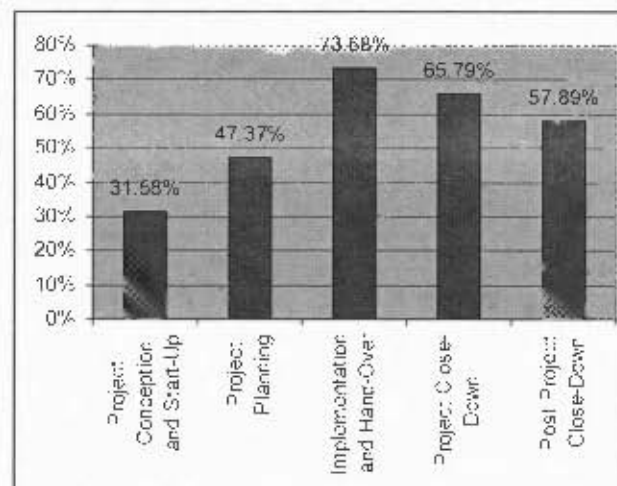


Figure 19: Histogram of responses for question 10

7.4 Research Question 2

Do information systems project managers use success measures that are compliant with the measures proposed in the project success literature?

The aim of the second research question is to compare the measures of project success in practice versus the measures proposed in the project success research literature.

The approach to evaluating this research question is same as for the first research question i.e. the mean for each question in section 3 of the questionnaire would provide an indication of the degree to which project managers used a particular measure.

Table 3 provides a summary of the analysis results:

Success Measure	Mean	Std Dev	Min	Max
<i>Conformance to time schedules</i>	4.26	0.72	3	5
<i>Conformance to budget schedules</i>	4.16	0.89	2	5
<i>Conformance to functional specifications</i>	4.3	0.85	2	5
<i>Quality</i>	3.89	0.95	2	5
<i>User satisfaction</i>	4.26	0.76	3	5
<i>Satisfaction of project team</i>	3.58	1.06	2	5
<i>Satisfaction of non project team stakeholders</i>	3.21	0.93	2	5
<i>Actual product use</i>	3.61	1.2	2	5
<i>Business Benefit</i>	3.82	1.11	2	5
<i>Project goal achievement</i>	4.29	0.87	2	5

Table 3: Results of analysis for question 2

The results show that all of the measures presented had means of between 3.21 and 4.3, which equates to a result of Often to Very Often. This means that all of the measures are frequently employed by project managers when evaluating the success of their projects.

Since all the measures had a mean of between three and four, the standard deviation was used to determine which of the measures had the greatest amount of disagreement. These were found to be Actual Product Use and Business Benefit. The histograms below show how respondents rated these two measures

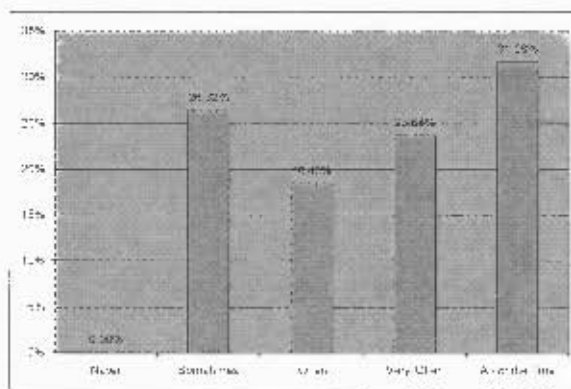


Figure 20: Histogram of responses for Actual Product Use

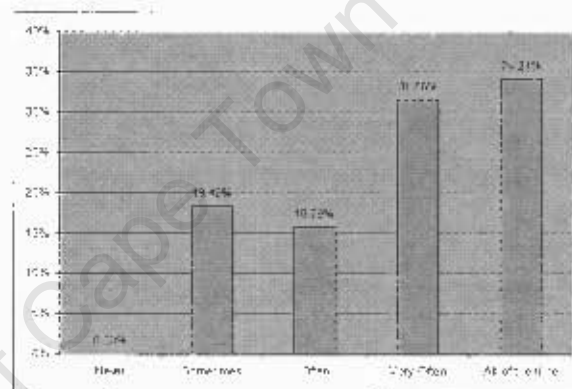


Figure 21: Histogram of responses for Business Benefit

Surprisingly none of the measures in the questionnaire were rated with a score of 1 (Never used at all). This could possibly be because the respondents were shown the measures, they agreed to the usefulness of them. Perhaps providing an opened ended question asking what measures they actually used would have provided more meaningful results.

7.5 Research Question 3

Do experience, education and organisational viewpoint play a role in shaping project managers perceptions of project success?

The third research question seeks to determine what the major factors were in determining the project manager's particular viewpoint.

The approach to evaluating this question was same as for the other two research questions i.e. the mean for each question in section 3 of the questionnaire would provide an indication of the degree to which a particular factor mostly influences their perceptions of project success, and the measures they use to measure it.

Table 4 provides a summary of the analysis results:

<i>Factor</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Min</i>	<i>Max</i>
<i>Experience</i>	3.45	0.55	2	4
<i>Organisational Viewpoint</i>	2.42	0.89	1	4
<i>Project Management Education</i>	2.89	0.66	1	4

Table 4: Results of analysis for question 3

Histograms of each of the factors (below) shows that experience plays the largest role in determining a project managers viewpoint of project success, followed by their project management education, and lastly the organisational viewpoint of the project manager.

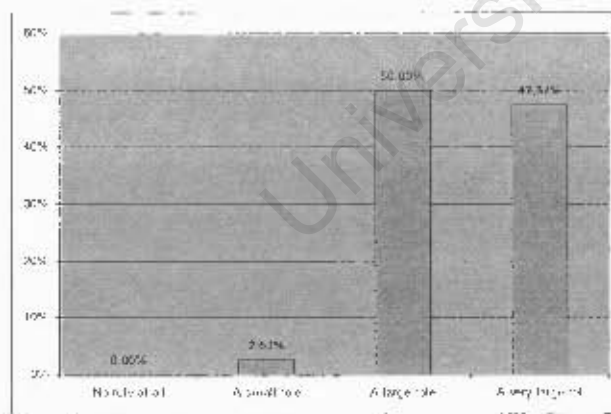


Figure 22: Histogram of responses for Experience

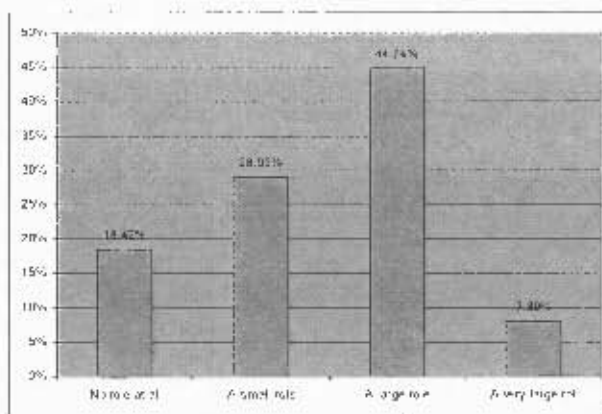


Figure 23: Histogram of responses for Organisational Viewpoint

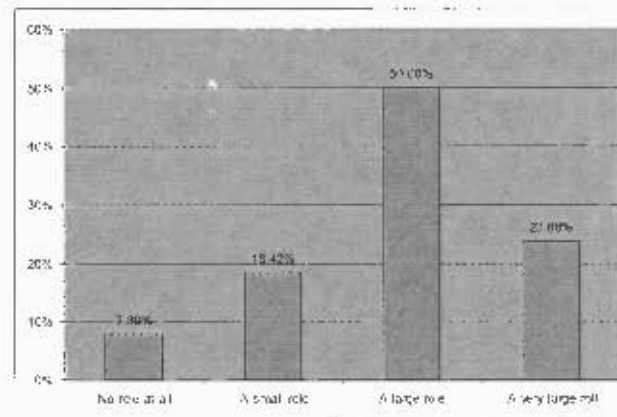


Figure 24: Histogram of responses for Education

The results of these questions show that the best way to get closer alignment between the project success research literature and project managers is through project management education, since the experience of a project manager cannot easily be influenced by other people.

The result of this research question lead to questioning if particular levels of experience or project management education lead to a particular viewpoint on project management success.

Thus, three correlations were done, using each of the factors (education, experience, and organisational view) as the independent variables in turn. The respondents view on project success was used as the dependent variables. Since the questionnaire collected multiple data values for project management education, a combined variable that contained the project manager's highest level of project management education was made.

Table 5 shows the results of the correlations. Those co-efficients highlighted are significant at the 5% level.

<i>Factor</i>	<i>Q1</i>	<i>Q2</i>	<i>Q3</i>	<i>Q4</i>	<i>Q5</i>	<i>Q6</i>	<i>Q7</i>	<i>Q8</i>	<i>Q9</i>
<i>Experience</i>	-0.15	-0.29	-0.27	-0.11	0.13	-0.23	0.02	-0.05	-0.36
<i>Org View</i>	0.04	-0.02	-0.36	0.05	0.07	0.16	-0.18	0.17	0.10
<i>Education</i>	0.23	0.21	0.11	-0.04	-0.10	0.18	-0.08	0.10	0.07

Table 5: Results of correlations for question 3

It was found that project management education was not correlated with any viewpoint of project success, but project management experience was negatively correlated with:

1. Different stakeholders have different views of project success (question 2)
2. The outcome of the product and the project management process should be measured separately (question 3)
3. There is a hierarchy of project success criteria (question 9)

However, since each of the questions used for the correlations was negatively worded, the correlation is positive. The reason why project management education was not correlated with any of the concepts of project success could perhaps be because of the diverse nature of project management education offered. Since (to the knowledge of the author) there is no standard curriculum for project management, no common viewpoint of project success would exist from education.

The positive correlations could show that these three items are the most prominent things project managers perceive as their level of project management experience increases.

A correlation with organisational viewpoint was also run. Interestingly, question 3 (The outcome of the product and the project management process should be measured separately) was correlated with organisational viewpoint. This could be the one point that organisations impart with project managers while working.

7.6 Summary of Findings

The results of the analysis showed that there was only disagreement between the information systems project managers and the project success literature in three areas:

- The traditional method of measuring project success is inadequate.
- Project success contains mainly subjective as opposed to objective measures.
- Project success is an abstract concept that lacks a standard definition and is difficult to measure.

The analysis also showed that all the measures of success proposed by the project success literature are used by information systems project managers, and that between project management education and an imposed organisational methodology, the best way to influence the viewpoint of the project manager is through education. Experience had the biggest influence over a project manager's viewpoint, but that is largely an external factor that is not easily influenceable.

Chapter Eight - Conclusions

This research has investigated information systems project manager's perceptions of the definition and measurement of project success, and compared it to a subsection of the project management literature that focuses on project success.

The motivation behind this research was primarily the lack of consensus surrounding the definition and measurement of project success, and secondly the diversity of literature available concerning project success.

The research started by surveying recent academic project management literature on the topic of project success. This produced the notion that there is a lack of consensus surrounding the definition of project success. The scope of the lack of consensus was not however stated. It could be within the project success literature alone, or between project management practitioners and the literature. A two phase methodology was chosen to address both possible areas of disagreement.

The first phase of the research analysed the disagreement within the project management literature. This involved randomly selecting several articles whose main subject was project success. These articles were then qualitatively analysed using a method called content analysis. The results of this analysis produced several themes concerning the concept of project success as well as a list of commonly mentioned measures. These themes were then considered to be a combined, unified view of the concept of project success. The results found that between mainstream project management literature and project success focused literature, there was a lack of consensus. However, within the project success literature, most of the articles discussed similar concepts, but using different terms, thus giving the illusion of a lack of consensus.

The second phase of the research analysed the lack of consensus between the project success literature and project management practitioners, an electronic survey was conducted in order to obtain the viewpoint of project management practitioners, using the results of the first phase of the research as a basis. The results showed that there

was mostly agreement between practitioners and the literature, and total agreement on the measures used to measure success.

The areas of disagreement were found to be:

- Within the sample of project managers, there was disagreement over whether they perceived the traditional method of measuring project success to be inadequate. This contention is mirrored in the project management literature, with the majority of project management authors still citing on time, to budget, and to specification as sufficient for measuring project success. There is no clear reason for this disagreement. However, it is suspected that this is still a '*hangover*' of years of proclamation of on time, on budget, and to specification in the project management community. It should be noted that this viewpoint is not *wrong*, but incomplete. The results of this research show that project managers should adopt a wider viewpoint when thinking about the success of their projects.
- Disagreement was also found over whether project success contains mainly subjective or objective measures. This most likely because of a general distrust of less objective measures, prevalent not only in the project management community. Since many factors on a project are not easily measurable, the use of only easy-to-measure objective measures again provides an incomplete picture of project success. However, research into the use of subjective measures has been conducted so there should be no other reason for this result except the distrust of subjective measures mentioned before.
- The last point of disagreement and perhaps the most important is the disagreement over whether project success is an abstract concept that lacks a standard definition and is difficult to measure. Here there was a direct contradiction of what the project management academics state, with project managers disagreeing with the previous statement. One possible reason could be because project managers do not want to admit, or are not aware that they are having trouble with the concept of project success. Another is that their project management education is not telling them that project management is an abstract concept that is difficult to measure. A third possibly is that the project managers are right and the academics are wrong about project success. The results don't provide an indication of what the reason is, but it is still important to think about.

In terms of measures, all the measures proposed in the questionnaire were well used by project managers. Some confusion could have arisen with project managers confusing the question as asking whether they would use the measures presented over whether they do use the measures presented. However, this wasn't picked up in the preliminary run of the questionnaire. Another interpretation of the results is that since there are such a wide variety of project types being run, there are a wide variety of measures in use and thus a general use of all the measures provided. A point to remember is that there are measures that are specific to project management and measures specific to the product being developed. Thus, a project manager should have '*technical*' knowledge of the product being developed in order to properly assess the success of the project.

The results of the third research question showed that experience is the biggest factor for influencing a project manager's perception of project success (which is generally un-influenceable). After that comes their education and lastly the organisational procedures. This result is important in that it indicates that the best way to change the perceptions of the project manager is through education, rather than imposing some form of methodology on them. Thus the most practical way to make the viewpoint of project success more widespread is through a change in how project success gets treated in project management education.

8.1 Limitations

Four limitations to the results of this study are:

- The presentation of options to project managers could have distorted the results. If project managers were not presented with options in the form of a survey, the results could have been different.
- The small sample detracted from the efficacy of the results of the second phase. A possible solution to this would have been to rather perform in-depth interviews to get a richer understanding.

-
- The study should have included more of the project stakeholders than just the project manager, in order to get a greater variety of understanding.
 - Perhaps the mixed methodology between groups detracted from the power of the analysis. A homogenous methodology for both groups could have provided a better way of comparing and analysing the differences between them.

8.2 Further Research

1. Further research could explore the development of a more substantial framework for measuring project success.
2. This research has highlighted the relationship between the success of the product (information system) and the project. Further research could investigate the dynamics of this relationship more closely.
3. Many studies cite quality as an important measure of project success. However, very often more than this is not said. Further research could explore the use of quality in application to project success, as the knowledge in the quality literature could surely be of help to the project success literature.
4. This research has also highlighted the difficulty in operationalising soft, subjective criteria specific to project success. Further research could help in this area.
5. The act of defining and agreeing criteria with all project stakeholders, during the start-up phase of the project also represents an opportunity for investigation.

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Appendices

Appendix A – Full Questionnaire

Section 1

1.1. Please indicate which project management certification or education you have obtained.

This includes any degrees/courses that have included project management modules/sections.

- ☐ University degree
- ☐ Professional qualification (e.g. PMP)
- ☐ Diploma course
- ☐ Certificate course
- ☐ Short course
- ☐ None

1.2. Approximately how many years experience as a project manager do you have?

- ☐ 0 - 2 years
- ☐ 3 - 5 years
- ☐ 6 - 10 years
- ☐ 11 - 15 years
- ☐ Above 15

Section 2

Below are ten statements that could be used to describe the concept of project success. Based on your experience, please indicate the extent to which you agree with each statement.

2.1. Adhering to budget, schedule and requirements specifications is adequate for measuring the success of a project

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree or disagree
- ☐ Agree
- ☐ Strongly agree

2.2. All project stakeholders have similar perceptions of project success

- ☐ Strongly disagree

-
- ☐ Disagree
 - ☐ Neither agree or disagree
 - ☐ Agree
 - ☐ Strongly agree

2.3. The success of the product should be evaluated separately from the success of the project management

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree or disagree
- ☐ Agree
- ☐ Strongly agree

2.4. Project success contains mainly subjective as opposed to objective measures

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree or disagree
- ☐ Agree
- ☐ Strongly agree

2.5. The success criteria of a project should be defined and agreed upon at the beginning of the project

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree or disagree
- ☐ Agree
- ☐ Strongly agree

2.6. Project success can be measured along a single dimension

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree or disagree
- ☐ Agree
- ☐ Strongly agree

2.7. The same criteria can be used for all projects

-
- ☐ Strongly disagree
 - ☐ Disagree
 - ☐ Neither agree or disagree
 - ☐ Agree
 - ☐ Strongly agree

2.8. The concept of project success is well defined and understood by me

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree or disagree
- ☐ Agree
- ☐ Strongly agree

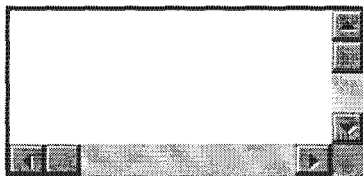
2.9. All project success criteria are of similar importance

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree or disagree
- ☐ Agree
- ☐ Strongly agree

2.10. Please indicate at what stages of the project lifecycle you tend to measure the success of the project (more than one answer allowed)

- ☐ Project conception and start-up
- ☐ Project planning
- ☐ Implementation and hand over
- ☐ Project close-down
- ☐ Post project close-down

2.11. If there are any other statements concerning project success, please enter them below.



Section 3

For each of the success measures below, please indicate how often you use that measure when evaluating the success of your projects.

3.1. The conformance to time schedules

- ☐ Never
- ☐ Sometimes
- ☐ Often
- ☐ Very often
- ☐ All of the time

3.2. The conformance to budget schedules

- ☐ Never
- ☐ Sometimes
- ☐ Often
- ☐ Very often
- ☐ All of the time

3.3. The conformance to functional/technical specifications of the product

- ☐ Never
- ☐ Sometimes
- ☐ Often
- ☐ Very often
- ☐ All of the time

3.4. The conformance to quality constraints

- ☐ Never
- ☐ Sometimes
- ☐ Often
- ☐ Very often
- ☐ All of the time

3.5. The satisfaction of those people using the product of the project

- ☐ Never
- ☐ Sometimes
- ☐ Often
- ☐ Very often

-
- ☐ All of the time

3.6. The satisfaction of the project team

- ☐ Never
- ☐ Sometimes
- ☐ Often
- ☐ Very often
- ☐ All of the time

3.7. The satisfaction of other stakeholders not on the project team

- ☐ Never
- ☐ Sometimes
- ☐ Often
- ☐ Very often
- ☐ All of the time

3.8. The actual use of the product by the end users

- ☐ Never
- ☐ Sometimes
- ☐ Often
- ☐ Very often
- ☐ All of the time

3.9. The business benefits obtained from the product

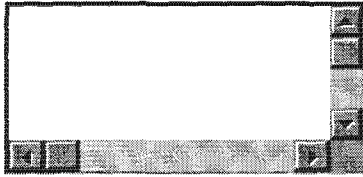
- ☐ Never
- ☐ Sometimes
- ☐ Often
- ☐ Very often
- ☐ All of the time

3.10. Achievement of the project goal

- ☐ Never
 - ☐ Sometimes
 - ☐ Often
 - ☐ Very often
 - ☐ All of the time
-

-
- ☐ All of the time

3.11. If there are any other measures that you would like to add, please enter them below.



Section 4

Please indicate how large a role each of the factors below played in your providing answers to the questions in Section 2 and Section 3 of this survey.

4.1. Experience

- ☐ No role at all
- ☐ A small role
- ☐ A large role
- ☐ A very large role

4.2. Organisational viewpoint

- ☐ No role at all
- ☐ A small role
- ☐ A large role
- ☐ A very large role

4.4. Project management education

- ☐ No role at all
- ☐ A small role
- ☐ A large role
- ☐ A very large role

4.6. Other factors - (please specify).



Section 5

5.1. If you have any other comments or suggestions regarding project success or this questionnaire, please include them in the space below.



Submit	Reset
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University of Cape Town

Section 2

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10.1	Q10.2	Q10.3	Q10.4	Q10.5
2	2	5	3	4	2	2	4	3			3		5
2	2	4	3	5	1	3	3	2				4	5
3	1	2	2	5	2	2	5	2	1		3	4	5
5	2	4	1	5	1	2	5	1	1	2	3	4	5
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1	2	2	2	5	1	2	4	2			3		
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4	5	2	2	4	2	1	5	3		2	3	4	
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2	1	4	2	5	1	2	4	2	1	2	3		5
5	3	5	3	5	3	3	5	5		2	3		
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4	2	5	4	4	2	2	2	2		2	3	4	5
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3	3	4	4	2	2	2	4	2	1	2	3	4	
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2	2	4	2	4	2	4	4	2	1	2		4	
2	1	4	2	5	1	1	4	2			3	4	5
2	2	5	2	5	1	2	5	2		2	3	4	5
4	5	4	2	4	3	2	4	2			3		

Section 2 Comments

S2 Comments
2 people will often have different realities about success, eg. Project Manager for a Store rollout will view his project complete and successful the day Store opens. The Business Sponsor may regard satisfactory monetary returns as the success factor.
Delivery of business value is often neglected as a success measure.
Requirements Definition/Logical Design
Physical Design
Project success should be a function of whether the business need has been addressed for a suitable cost (i.e. value in terms of benefits versus costs is more important than budgets versus actual).
1. Degree of organisational turmoil caused in client's company. How the change was managed. 2. Client's staff acceptance and level of participation in project. How the change was managed.

Stakeholder satisfaction is very important.
Team satisfaction also important, i.e. is the team ready, willing and able to do a similar project again?
A successful project for me implies that the project was implemented on time, within budget and according to specification.
Projects are not always cast in stone, and a degree of success is also one's ability to be flexible and renegotiate any budget/scope/schedule changes to the agreements of all stakeholders during the entire lifecycle of the project.
You must have consensus from all stakeholders as to the definition of success before starting on a project.
Weekly/Monthly/Fortnightly Review Meetings
Defining and agreeing deliverables up front in Project Definition Stage as well as managing scope creep via a formal Project Scope Change process and good communication with all stakeholders are all key to project success!
I agree strongly that the success of the project deliverables should be distinguished from the success of the project. Sometimes this can only be evaluated effectively long after the project has completed. e.g. what business benefit has been produced and
A project is successful if the users requirements (stated or otherwise) are met to the users satisfaction. This may mean altering what is delivered, or it may mean managing the users understanding of their requirements and what is reasonable to deliver.
Efficient use of resources (and getting the resources that you need) and conformance to scope (i.e. containing scope and avoiding gold plating) are key.
Resource ownership and the management of change in the customers business process will greatly determine the success of your project. In most cases perception is reality.

Section 3

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
4	4	4	4	5	5	5	5	5	5
3	3	3	3	3	3	3	3	3	3
5	4	4	3	3	2	2	2	3	3
5	5	5	5	5	2	2	5	5	5
5	5	5	5	4	3	4	5	4	5
3	3	4	4	5	4	5	5	5	5
5	5	5	2	4	5	4	3	2	5
3	4	3	3	3	4	3	3	4	4
4	4	5	4	3	3	3	2	2	2
4	4	5	4	5	3	3	5	5	4
4	4	4	5	4	4	3	3	3	4
5	5	5	5	5	5	4	3	4	5
4	4	4	3	5	5	4	4	4	4
5	3	5	5	5	4	4	4	4	5
4	5	4	4	4	3	3	2	3	4
5	5	5	4	4	2	2	2	2	5
4	4	4	4	5	3	4	2	4	5
5	5	4	3	3	3	3	2	2	4
5	5	5	4	4	4	3	5	4	4
3	2	4	3	5	4	3	5	5	5
5	5	5	5	5	5	2	5	5	5
4	4	4	3	4	2	4	4	5	5
5	5	5	3	5	5	5	5	5	5
3	2	4	3	5	5	2	2	5	5
4	3	3	4	4	4	4	4	4	4
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4	4	3	4	5	3	4	5	5	4
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4	3	5	2	4	3	3	2	4	4
3	5	5	5	4	5	3	5	5	5
5	4	3	4	4	2	2	4	4	4
4	4	5	5	5	3	3	4	5	5
4	4	3	3	3	3	2	2	3	4
5	5	5	5	5	5	5	5	5	5
5	5	5	4	4	3	3	4	2	2
4	3	5	4	4	5	2	3	3	5
4	4	4	5	5	3	3	4	4	3

Section 3 Comments

S3 Comments
No matter how successful the running of a project was if the client doesn't use the product then the project was futile. i.e. the correct objectives & requirements were not established at the outset.
Measurable objectives (balanced scorecard) - cost/revenue drivers
Were any experience & knowledge gained? Streamlining processes, information gathering and adaptation accordingly?
Project End Survey
Different projects and different project sponsors will have different views as to which (if any) of T, Q, C are the most important for them.
The benefits realisation of the product is often the ultimate measure of success. However, it is seldom that resources are allocated into making sure that the objectives of the business plan were met - i.e. increased sales, better alliance

as a result of

Section 4

Q1	Q2	Q3
4	1	3
3	1	3
4	3	3
4	1	4
4	4	2
4	3	1
3	3	4
4	4	3
4	2	3
3	3	4
4	2	3
3	2	4
3	1	3
3	2	4
3	3	3
3	4	3
3	2	3
4	2	2
3	3	4
4	2	3
4	3	3
4	2	3
4	2	4
4	3	2
2	3	1
3	3	3
4	2	3
3	2	2
3	1	1
3	3	3
3	3	2
3	3	4
4	1	2
4	3	3
3	3	3
3	3	4
4	1	2
3	3	3

Section 4 Comments

S4 Comments
Project management peers - large. Own personality - very large.
Commitment to, and formal management of software process establishment and improvement
Track record of previous successes (as opposed to purely just experience)
Common sense and a desire to always strive for win-win solutions to problems.

General Comments

MS5Q1

Utilisation by end users and business benefits are very important measures but there is usually no budget to measure these formally hence the other measures tend to be used more frequently

Good luck with your studies!

One way to ensure success of a project is to under promise and over deliver.

I think a balanced view should be obtained by running the same questionnaire across a number of project sponsors, to get the view from the other side of the table. PM's can sometimes present pretty one-sided viewpoints...

If you don't have buy-in from all parties then your project will probably fail e.g. if you're writing a new system to replace an existing one then the end users must be convinced of the value of changing the way they do things. Users who are resistant to

Just let me know how this survey went.

E-mail: Romcoob@pcusa.net objects.com

Resolving project issues pro-actively & speedily and communication with the client/sponsor can go a long way to helping build up a perception in the client/sponsor's mind that the project has been successful!

There is a clear distinction between theory and practice.

Essentially I believe that project management should be performed by a hands on project manager following a simple project management process. When project management becomes a full time function the project team eventually see the project manager as a ne

Quality Management Plays a very key role in the success of a project

Systems make it possible, people make it happen.

Good luck. Hilton