Gordon Institute of Business Science
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The relationship and effectiveness of project planning constructs for project success

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Abstract

The purpose of this study is to clarify the effectiveness of project planning on project success that is achieved by reviewing the relationship at the conceptual model that created based on stakeholder theory, project success framework, and literature review in the concept of planning, project management and project success.

This study used the online quantitative cross-sectional survey with 30 questions to collect the data from project managers (n=139) without limitation on industry and location. The Confirmatory Factor Analysis, Structural Equation Modelling, and multiple regression statistical analysis were used to analyse the data.

Findings presented the positive statistical relationship at a 95% confidence level between 1) Time management and project management satisfaction 2) Cost management and Project management satisfaction, and 3) planning and project success. Managers can use the time and cost management constructs to satisfy their stakeholders and achieve project success.

This study contributes to the current literature on project success, also add new insights on both time and cost management, as well as project management satisfaction. Moreover, business domains can use the results of this study to better understand investment requirements in planning for their organisations.

Keywords

Project success, Project planning, Time management, Cost management, and Project management satisfaction.

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination at any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Shahram Shariatzadeh Sigaroudi

7th November 2018

Signature:

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Glossary

AVE – Average Variance Extracted

CBS - Cost Breakdown Structure

CR - Composite Reliability

CFA - Confirmatory Factor Analysis

EFA - Exploratory Factor Analysis

EPCM – Engineering, Procurement, Construction, and Management

ISO - International Standard Organisation

KMO - Kaiser Meyer Olkin

PCA - Principal Component Analyses

PMBOK - Project Management Body of Knowledge

PMI - Project Management Institute

RCM - Rotated Component Matrix

SEM - Structural Equation Modelling

VIF - Variance Inflation Factor

Chapter 1: Introduction to Research Problem

1.1 Research Title

The Relationship and Effectiveness of Project Planning Constructs for Project Success.

1.2 Introduction

In recent years, most of a countries' capital is spent on projects as this type of spending makes a contribution towards the economic development of a society (Paramati, Apergis, & Ummalla, 2017). Projects are related to each other through various logical relationships that rule them and are carried out through a predictive view of project implementation (Bruni, Di Puglia Pugliese, Beraldi, & Guerriero, 2017)

A main concern of project managers is that a project should be finished according to a predetermined schedule and allocated budget. Therefore, the most significant areas of project management are costing and timing within the context of limited resources (Yang, Qi, Li, & Gao, 2016). To implement projects, regardless of type project, the managers must accurately plan the time in line with the project objectives, achieve financial plans and control the implementation of a project in a correct way. This will results in the completion of a high quality project (Zadeh, Wang, Cavka, Staub-French, & Pottinger, 2017). Since projects are inherently complex and dynamic, with individual project owner' goals and preferences, different project stages within the life cycle of the project, different levels of management, the success of large industrial projects depends on a systematic approach of planning and controlling the way of implementing the procedures in terms of time and cost; The criteria of success for a project vary from organisation to organisation, based on their philosophy of existence, strategies, culture and performance. (MacKerron, Kumar, Benedikt, & Kumar, 2015)

The main task of the project planning system is to provide, collect, record, store, process, classify and analyse the information on different stages of the project life cycle and preparation of the necessary reports for the project manager (Fu, Subramanian, & Venkateswaran, 2016). The purpose of the planning system is to fulfil the project according to the timetable and allocated budget and to determine the final objectives and products of the project. This information is usually store and used for future projects (Papke-Shields & Boyer-Wright, 2017). Without successful projects, an organisation will turn to a static

environment which does not have any communication with competitive environment around it; So, managers and executives are always looking for ways to investigate and find out the right solutions for a project's success. Hence, all project beneficiaries seek to obtain clear and precise information about the status of project progress and its success (Papke-Shields & Boyer-Wright, 2017).

With the continuous advent of science and technology in the industrial world and the human requirement for various projects, project managers are encouraged to use new knowledge and skills in compliance with the type and nature of the projects. In addition, there is an expectation of high quality project activities of high quality in compliance with the predicted time and cost (Badewi, 2016). Hence, the impact of planning on the project success has been studied as purpose of this research.

1.3 Background of the Research Problem

A project has features that distinguish it from activities and organisations. Today's competitive world has made even organisations that produce their products (or services) through operations, and feel the need for performing different projects in their organisations. This is due to the competitive needs for defining new projects to design new products, reduce cost and change product lines (Joslin & Müller, 2016). Projects also provide opportunities for innovation, revenue growth while assisting an organisation in achieving operational and financial success (Razmdoost & Mills, 2016).

Determining the success rate of a project over the past three decades has been one of the controversial issues. For years, researchers concluded that the three factors of quality, budget, time also known as the golden triangle, cannot be the only benchmark for estimating the overall success through the lifecycle of a project (Ahimbisibwe, Tusiime, & Tumuhairwe, 2015). Various factors can be involved in the project life cycle, the most important of which is the employer, contractor, consultant, and the beneficiary, from each one's point of view, the concept of success may vary (Todorovic, Petrović, Mihic, Obradovic, & Bushuyev, 2015)

The success of project management depends on the final results of the projects. Project management means the use of logic and tools associated with planning, guide, and control of a temporary effort (Papke-Shields & Boyer-Wright, 2017). The objectives of project management include controlling the time, cost and the progress of the projects. In fact, project management is the process of controlling the project in achieving success and he goals of the project (Asad Mir & Pinnington, 2014) .Project success is achieved when the

specific objectives of a project management are achieved through the prudent use of resources for all activities and responsibilities. In other words, project success depends on the management of cost, time, project objectives and quality (Crucke & Knockaert, 2016).

Project management has now become a science based professional skill with various standards, methods, tools and techniques. These standards, methods and tools are essential for co-ordinating all involved in the project and ensuring the correct implementation of the processes. Project managers are faced with serious challenges during the implementation of a project as high quality standards should be implemented within the shortest timeframe, lowest cost and the minimum resources (M. L. Martens & Carvalho, 2017). One of the primary capabilities of a project manager is to respond to organisational changes and gain a competitive advantage for the organisation (Taylor, 2016).

The primary goal of project management is to complete the project in less time, minimum cost with desirable quality in compliance with the definition of the scope of the project. A successful project is to be completed with the minimum time and cost and the highest possible quality, based on what has been defined in the project scope (Fisher, Pillemer, & Amabile, 2017).

Using a stakeholder model and stakeholder analysis approach for projects in different industries consisting of several interrelated organisations, can improve the quality of identifying the processes required by each organisation to meet the needs of associated organisations. In this way, the overall quality of the communication between these organisations (Schnackenberg & Tomlinson, 2016). The stakeholder analysis approach relies on the use of information gathering is no need for more information about the projects, so it is possible to use the information in each phase of the project, even after the project is completed. Furthermore, there is no need to improve and update the processes used in the industry (Miles, 2017).

Ordinary people as end users of project products have limited expectations from a project, while the expectations for project outcomes and the interpretation of success vary in terms of quality, time, cost and safety for different groups such as the employer, consulting firms and contracting sectors Consequently, prior to the start of a project, predicting the performance is a critical for the employer because they need it during making an initial decisions, since uncertainties are maximized during this stage then having an image of the future may be an objective basis for the initial planning (Carvalho & Rabechini, 2017)

In the recent past, there was a growing demand for the project management in different organisations to help organisation reach their goals; And the literature on project management showed, using proper application of knowledge, processes, skills, tools and measurement techniques to control the project, It can have an important impact on the success of projects. (Papke-Shields & Boyer-Wright, 2017).

The progression of project management techniques among different industries, companies and organisations, is the cause of the significant improvements in their planning; And effectiveness of the professional growth in project management can be seen in the growth of relevant organisations (Gond, Cabantous, Harding, & Learmonth, 2016).

The lack of adequate and extensive knowledge about the success factors of a project makes it difficult to control and monitor the project. Therefore, according to the type of projects, identifying the factors that affect the failure or success of the projects by the managers, employers and administrators can provide a good framework for evaluating the outputs of the project. Understanding the success factors of projects can also help with managing the allocation of appropriate resources throughout the life of the project (Asad Mir & Pinnington, 2014). Moreover, Belassi and Tukel (1996) argue that insights about project success factors has a high value on the efficiency of the project management process, as it affects how project management process can be used to measure project success.

Different factors can be attributed to project failure to achieve project objectives. Reasons for project failure also from one project to another. Many factors leading to project failures are attributed to internal and external challenges (Y. Hu, McNamara, & Piaskowska, 2016).

Chen (2015) share the same opinion about project failure. Since the 1960s, despite all efforts by project management researchers, factors for project success have still not been discovered (Todorovic et al., 2015). Project performance is evaluated in terms of the success of the project. The scope, complexity and diversity of projects in various industries made doubled the importance of the management of these projects (Chen, Chen, & Lin, 2016)

In project planning, one can refer to the Cost Breakdown Structure (CBS) which is used in the estimation process to manage the costs. During project implementation, this system is used to develop, collect, organize and report raw project information. The CBS organizes the costs of these data at the level of partial information and transmits it to a higher level of information summary. Along with increasing the detail of the project, the more detailed

levels can be added to this structure which was developed at the planning stage (Khodakarami & Abdi, 2014).

The main purpose of project planning is to direct the implementation of projects. To direct the implementation the programs must be real and usable. Adequate effort and time should be devoted to the planning process, and planners must have sufficient project knowledge. For example during the planning process a review of the relationship between knowledge areas contributes to project success (Badewi, 2016). Limited research acknowledges this relationship and the impact on project success.

The Project Management Institute (PMI) as the custodian of standards, guidelines, practices, and principles of project management specify that the planning is one of the project management processes that is connected to several knowledge areas (PMI, 2017) and Carvalho and Rabechini (2017) mentioned project management has a positive effect on the success of the project, thus it does not mean the processes under project management have the same relation to the success of a project, so each process must be checked independently then it can expand it to the planning. Therefore, the aim of this study is to investigate the effect of time and cost management (as construct of planning) planning on project management satisfaction (as construct of project success).

In addition to time, budget and quality there are many other criteria in projects that can affect long-term project success. Organisations usually have goals in terms of survival, improvement, growth and development and a clear plan on how to achieve these goals. The result of these plans is nothing but a set of projects that must be implemented so that the organisation ultimately achieves its goals. But the problem most companies face is the lack of organisation and system for managing these projects (Ahimbisibwe et al., 2015).In other words, most companies do not have the authority to plan, execute, monitor and control the performance of the project, and most projects are completed separately by different units, spending a large amount of resources and costs, and exceeding the predicted plan and ultimately prevent the organisation from achieving the goals set at the given time, while for organisations, achieving the goals at the determined time leads to competitive advantages, and exceeding that time does not provide the goals with competitive advantages. Therefore, planning is meaningful in an environment which gives importance to success. If there is no success, planning is meaningless (Y. Hu et al., 2016)

A key criteria in project management is the percentage of project progress. This criterion is the main indicator of project performance. Calculating project progress and comparing it with the project timetable eliminates many of the ambiguities and outlines the status of the

project (X. Hu, Cui, Demeulemeester, & Bie, 2016). The project timetable is a part of the project management process planning group in the field of time management of the project by which the project activity and the start and the end time are determined considering the project scope (Iyer & Banerjee, 2016).

1.4 Research Problem

Pay attention to the question that which factors contribute to the success of project management, is a critical issue in project implementation. Having a specific tactics to achieve project success are among the issues that only are possible with the application of techniques and knowledge of project management (Bakhshi, Ireland, & Gorod, 2016).

One of the key concerns during the project management processes of the lack of familiarity with teamwork techniques experienced by project teams. A project team will be disbanded upon project completion and it will not come to an end, while team members must evaluate and document their experiences before the team is disbanded. Because considering past experiences and using them in future projects will reduce scheduling time and spend less on planning resources (van der Hoorn, 2015).

In recent years project management and project planning processes were used as a tool for measuring project success. Project management is implemented to manage optimization of overall project decisions and avoid unnecessary costs to minimize time and optimize the use of limited resources (Sligo, Gauld, Roberts, & Villa, 2017). The project managers have paid attention to provide high quality services. Managers are willing to provide services that increase satisfaction and the level of participation in social activities in order to attract trust and raise capital. Considering the importance and the key role of the projects as one of the important industries, the necessity of increasing the quality of projects is of particular importance (Lindsjorn, Sjoberg, Dingsoyr, Bergersen, & Dyba, 2016). Therefore, attention to project quality management is also very important. What is more important in projects is the satisfaction of employer expectations and customer satisfaction. One of the problems in the industry that has created the need for a comprehensive quality management system is Lack of attention to the necessities of the work environment and manpower in the plans, Lack of teamwork and employee participation in operations, and Increased costs in the industry (Garwood & Poole, 2018).

However, should projects eventually fail? How much can such failure be attributable to the lack of planning? And vice-versa. This research focuses on understanding the effectiveness of planning for project success, as well as to assess if there are positive

relationships between planning and project success based on responses from project managers. Planning is a functional tool for the management of projects (Colin & Vanhoucke, 2014), and project managers use it to measure and improve performance and make decisions leading to success (Asad Mir & Pinnington, 2014).

1.5 Significance of the Research

It is very important to pay attention to the main factors behind the success of the projects because they can provide successful results. Problems such as the existence of performance distances in projects, inconsistencies between working groups, activities incompatible with project objectives, misunderstanding the operations, mutual distrust, and many other problems that ultimately lead to failure of the project, highlights the importance of identifying the success factors in the project (Belassi & Tukel, 1996). Initial planning has a special importance in achieving project success. In fact, early incorrect decisions, inadequate initial planning, and failure to identify the way ahead, have been the choice to fail from the very beginning. Planning as a principle in project management has a great influence on the failure or success of a project (Todorovic et al., 2015).

Project planning means the allocation of time to start the activities of a project to achieve a specific goal. This goal may be related to financial, time, qualitative, contractual or other aspects of the project. Given the growing trend in industrial development and the gradual increase of industrial projects, the correct planning and managing project is essential in these sectors. Projects usually have specific purposes, so that the project will be completed with achieving these goals. These goals are attainable and temporary. When different aspects of the project are considered, one of the best criteria to evaluate planning is the evaluation of project scheduling. Project management has been widely recognized as a vital competence. From theoretical point of view, the definition of the success of project still is not clarified, but some literature argue that the project management satisfaction and project success are equal (Chen et al., 2016; Heravi, Coffey, & Trigunarsyah, 2015; Papke-Shields & Boyer-Wright, 2017). This study reviewed the direct relationship between planning (only time and cost) and project success (project management satisfaction).

From the business point of view, projects spend time and cost on planning based on a common belief that to have a more successful project is to undertake more planning and spending resources on planning but maybe the project is not successful (Osiyevskyy, Costa, & Madill, 2016). This study helps to understand the relation between the concept of project planning and project success, and by extension, assists businesses to understand

spending resources on planning (time and cost) has any added value for business or not. The project managers seek to take the necessary measures by identifying the planning impact on project success factors. They also seek to adopt appropriate strategies for each factor, and appropriate synergy among all organisational components, systems and organisational processes in order to strengthen these factors. The insight of this study is about relationship of project management satisfaction (construct of project success) and time and cost management (construct of planning).

1.6 Scope of the Research

The success of a project is one of the most important goals and concerns of managers and all people involved in a project, which is a kind of unity of effort among all members of the project team (Joslin & Müller, 2016). Project managers are chosen as key participants for this research but because of accessibility to an acceptable number of project managers, the global focus of the study is not limited to specific geographical place or specific industry. Many factors influence on success, identifying these factors contributes to the successful implementation of projects and project management team is one of the main important factors. The results of the study will be useful and suitable to organisations around the world.

1.7 Research Purpose

Samset and Volden (2016) defined a project as a temporary effort to generate a distinctive product or service that it has defined a start and end, scope, resources, and using the project management to achieve requirements of the project. According to the PMI (2017), schedule, quality or performance, and cost are the main objectives of project management. This is based on the nine factors influence on project success; and planning outputs. Schedules, controlling of progress and aspects such as quality and cost are the areas that generally project management focuses on to drive project success. Planning in projects play a vital role for project management and success. Failure to pay attention to this can play a destructive role (M. L. Martens & Carvalho, 2017). This research tries to measure the effectiveness of planning for project success.

1.8 Research Structure

The remainder of this research is divided into six sections. The first section is the literature review section which outlines the major themes of the study, which is the effectiveness of planning on the success of the project with a focus on time and cost management as planning constructs and project manager satisfaction (behalf of stakeholder) as a construct for project success. The second section provides the detailed methodology of how this research is to be conducted. At the third part, hypothesises of the research are explained. In the fourth section review the main results, and at the fifth part discuss the results that reviewed at previous part, then at sixth part discuss concludes of research based on all from Chapter one to Chapter six. The research finish with supporting documents at the appendixes the same as consistency matrix as a translating the literature to the relevant hypotheses, and questionnaire.

Chapter 2: Literature Review

2.1 Introduction

As cited by Martens and Carvalho (2017), planning and management play a vital role in project success. One of the main components in the process of project development is initial planning. Other components include organizing and coordinating resources, followed by proper guidance and precise control. The lack of paying attention to this crucial issue can play a destructive role during the project management process. There is an increase in the relationship between systems and value of limited available resources. is increased. Samset and Volden (2016) noted that a project is a temporary effort to provide a unique product or service that is distinguished from the manufacturing and routine works. With an increase in project management knowledge and its application in different domains, there is increase in the utilisation of project control methods. In addition, failure to execute projects within the specified timeline increase the obstacles and challenges to initiate new projects within that specific industry then based on the direct relationship between time and cost of project implementation, increasing the time often leads to higher costs (Y. Hu et al., 2016). Alternatively, a delay in projects can also affect the quality objectives where by project administrators will attempt to accelerate the implementation process in order to prevent penalties caused by unauthorized delays manner (Colin & Vanhoucke, 2014). Therefore, accurate planning encourages success during strategic decision making.

Before considering the project-related topics, first the concept of the project must be clearly identified in a precise manner, so it helps clearly to identify which activities and actions can be called project. Project management experts describe the project as a set of activities that begin and end, so that this set of activities is not generally repetitive.

The word ‘project’ originates from the Latin word ‘projectum’ that is derived from Latin verb ‘proicere’. The word comes from the combination of the two words ‘Pro’ and ‘Jacere’, which means ‘before’ or and ‘throwing’ respectively. Therefore, the "project" is a move to the future, with planning that has already been prepared (Oxford-Dictionary, 2018).

According to PMI (2017), the project is a set of temporary efforts to fulfil a commitment, or to produce a product or to provide distinct, non-repetitive, and unique services. Also, according to the definition of the International Standard Organisation (ISO), project is a distinctive process consisting of a set of coordinated and controlled operations with the start and end time in order to achieve a specific goal with specific requirements, taking into

account time, cost and resources constraints (Zandhuis & Stellingwerf, 2013). Projects are a set of unique activities that are defined to provide a unique purpose; Prior to implementation, project activities are planned for implementation in the future and the initial scheduling of the project is set (Davari & Demeulemeester, 2016); in other words, a project is a set of activities which are done to achieve a particular purpose or goals; projects include activities that must be completed at certain dates with specified costs and qualifications (van der Hoorn, 2015). Samset and Volden (2016) mentioned projects are made up of processes and a process is a set of actions that lead to the results.

2.1.1 Project Features

Projects are temporal (time of start and end are specified) and unique in results, efforts, management and goals. In addition, project goals are concentrated on creating optimal coordination between time, quality and cost, which is also viewed as project performance criteria (PMI, 2017). Davari and Demeulemeester (2016) describe the six main features of a project. These features are often used as definitions of a project: The project is based on new and non-repetitive work; A project has specific objectives and results which should be evident upon completion of the project in the form of a product, commitment or service delivery; The project is temporary, it has a definite starting time and end time, and it's not infinite; In order to obtain the results of a project, the project should be divided into distinct, non-repetitive, and discontinuous work packages, each of which has a limited time and there is a special relationship between them; Each of these work packages or activities requires different work resources; And the project's budget is limited and predictable and must have a financial support.

2.1.2 Project Life Cycle / Project Phases

According to Oellgaard (2013), project managers and organisations are able to divide the projects into several stages to assist the project process while establishing appropriate communication with further processes in the organisation; These set of stages are referred to as the project life cycle. The life cycle of any project represents the line between the start and the end of the project. In the life cycle of any project, there will always be a change in the level of technology used when moving from one phase to another (Van den Ende & Van Marrewijk, 2014), In order to move from one phase to another necessary steps should be taken to determine the degree of completeness, accuracy, and output of that phase and obtain the necessary approvals. Of course, in some projects and with the acceptance of logical risk, it is possible to start the next phase before the end of a phase. Such action is

called ‘the quick action method’. Such a method is, in fact, an example of the process of shortening the project schedule by overlapping the phases of the project (Van den Ende & Van Marrewijk, 2014).

2.1.2.1 Planning

Papke-Shields and Boyer-Wright (2017) point out that the planning phase of the project involves the preparation of the project budget, identification of resources needed, scheduling of important activities, the conversion of targets into tangible activities and the formation of working groups for these activities. The major stages of this phase are:

- Refining of the project scope; it means balancing between the three factors of quality (result), time, and cost (resource).
- Providing a list of necessary activities to achieve the project goals.
- Determining the best sequence of activities.
- Providing an effective program and budget to allocate resources to activities.
- And finally, obtaining approvals needed for the project plan (Sligo et al., 2017).

2.1.2.2 Execution

Lyer and Banerjee (2016) noted the project's execution phase includes of coordinating and managing the project team to effectively carry out the project activities in accordance with the program obtained in the previous phase; and in this section the emphasis is on the correct work do by the resources. Some of the important activities of this phase are: Leading project team; Holding meetings with team members; Relationship with important people involved; Solving and obviating the claims and contentions at the period of project execution; And provision of required resources (money, energy, equipment) for proper implementation of the project plan (Papke-Shields & Boyer-Wright, 2017).

2.1.2.3 Control

Ekrot, Kock, and Gemünden (2016) mentioned the control phase is a step in which the trend of implementing project is monitored. The current and previous phase coincide, and the entire second to fourth phases of a cycle. At this stage, the achievement rate of the set goals is measured while the commands are imposed to re-implement the program and eliminate contradictions that affect project outcomes and delivery times or quality (Chen et al., 2016). The emphasis of this phase is on how the manager controls effectively the unplanned delays, the violation of the budget ceiling or a change in the scope of the project. In this phase, the manager should select the best option for solving project problems.

According to Asad Mir and Pinnington (2014) the stages of this phase are: supervising implementation and reporting conflicts with the program; the confirmation of corrective decisions, matching implementation with the program; receiving the projects, and evaluating and deciding on their changes that proposed by major stakeholders or members of the project team; reprogramming if needed; adjusting of resource levels if needed; modifying the scope of the project; and returning to the program to match the results and objectives and obtaining the necessary confirmations.

2.1.2.4 Closing the Project

The effect of all activities and efforts are observed during the final phase of the project. Undoubtedly, the most important project phase is to close it and Project management is responsible for completing the project with stakeholders satisfaction; Often the end of the project is due to the completion of the budget and the controversies of contractor and employer (Enshassi, Kochendoerfer, & Al Ghoul, 2016). Taking an approval for the final acceptance of the project results is the most important activity of this phase. The steps of the project closure phase are: obtaining and documenting the results and knowledge; reviewing the project implementation process and the results with the project team and the key individuals involved; stopping the executive operations and dissolving the project team; reviewing the project experiences; and writing the final report of the project (MacKerron et al., 2015).

It should be noted that the phases of planning, implementation and control are all in one cycle. This is due to the internal dependence nature of these phases with each other. For example, it is sometimes necessary to modify the project plan based on the experiences gained during its implementation or due to the changes occurred at the time of the project, and to resend the corrected results for implementation (Yun, Choi, de Oliveira, & Mulva, 2016).

2.2 Project Success

The definitions of the project success depend on the type, magnitude, complexity and people involved people in the project (Yu, Flett, & Bowers, 2005). Empirical research exploring the success of projects reveal that cost, time and quality are the most important indicators of project performance. One of the critical approaches to project success is the achievement of goals with regard to cost and time. Also, success in project management is defined as achieving predetermined goals, which includes a set of parameters such as time, cost, performance, quality and safety. The quality of conducting project management

activities has an undeniable role in the success or failure of projects (Colin & Vanhoucke, 2014). Dvira, Razb, and Shenhar (2003) is of the opinion that completion of the project in the cost, time, and quality limitations will lead to project success.

However, the authors present a wider definition of project success by adding further conditions to project success. They considered the project was successful when it is completed under some conditions: at the allotted time; in the predicted range of budget; at the level of proper performance or specifications; with the employer satisfaction; the product or service resulting from the project is actually used by the customer; with minimal change in the scope of the project or with accepted two-way changes; without disturbing the organisation's main work; and without changing the culture of organisation (Todorovic et al., 2015).

For those involved in a project, the success of a project usually happens with achieving some predetermined project objectives, such as performance, quality, time, cost, and safety; but we should not forget that users and public opinion do not have such predetermined objectives (Dvira et al., 2003). Therefore, expectations about project output and the individual's perception of the success or failure of the project will be different (Colin & Vanhoucke, 2014)

The success factors of the project were used first time by Murphy, Baker and Fisher in 1974 and described as factors that could predict the success of the project (Prabhakar, 2008). Various researchers have divided these factors into different groups according to the type of project and the level of study (Gunduz & Yahya, 2018)

Lim and Mohamed (1999) defined the factors of the project success as a set of environmental factors, facts or influential factors that can affect project outcomes; these are the factors that can speed up a project or making it difficult and these factors can lead to success or failure of the project, but they cannot be the basis for project evaluation.

2.3 Project Management

In recent years project management became one of the key domains of management. The emergence of industrial revolution and establishment of the new concept named mass production lead to scientific attention to management (Samset & Volden, 2016). Thus with the development of science and technology and the information age, industrial and manufacturing organisations are urged to change traditional processes of management and administrative bureaucracy in order to increase to improve a level of competitiveness

(Fortune, White, Jugdev, & Walker, 2011). With the advent of these changes various industries were forced to take advantage of the new concept of management science (Chen et al., 2016).

The project success is to achieve all three factors of time, cost and quality, and being each of the three mentioned factors out of the determined range can lead to unsuccessful and non-economic projects (Joslin & Müller, 2016). Or in other words project management is to plan and direct the project in the determined time, cost, and quality range to create specific results and includes planning, organizing, monitoring, implementing, and directing implementation, and attempts to deliver the specified and expected results using the correct resources at an agreed expense in the correct time (M. L. Martens & Carvalho, 2017). In other words, project management is to use the knowledge, skills, necessary tools and techniques to manage the flow of activities in order to meet the needs and expectations of stakeholders of project (Heravi et al., 2015). Rezvani, Chang, Wiewiora, Ashkanasy, Jordan, and Zolin (2016) also state that if project managers as one of the stakeholders are satisfied with the project can be deemed successful.

Project management to direct the project into the desired goals utilises two powerful tools namely planning and controlling; Also the goals of project are specified based on customer satisfaction and attention to three factors of time, quality and cost (Heagney, 2016). At a glance the tools and methods used in project management appear to be wasteful, time-consuming, and expensive. However, it should be noted that project management is the only way to utilise human, machine and money in an effort to complete a new project correct and on time during the first attempt (Garwood & Poole, 2018). Project management or management based on projects is an effective method in the management to deal with new work and to pay attention to cost and quality in the limitation of time (Heagney, 2016).

Project management requires the use of logic and tools to plan and direct and control a temporary effort. Some organisations perform this on a professional level, while others may use project management skills in some cases and situations. Their purpose is to influence the change created in the nature of something which is out of its ordinary state, this change can be physical or social (Ekrot et al., 2016). The quality of conducting project management activities has an undeniable role in the success or failure of projects. Particularly in project-oriented organisations with large projects, the success or failure will be extremely critical; because the success of these companies depends on the success of their projects (Chen, 2015).

A project in its life cycle faces many risks that in the face of each of them, the results of them should be evaluated and analysed. Technological developments and globalisation are all factors that compel companies to calculate the risk of projects that have a high financial expense and require future planning (Papke-Shields & Boyer-Wright, 2017). In today's society, which often make use of complex systems, disabling a system or occurring incidents can lead to disruption on various levels and even become a threat to the society and the environment. It can be assumed that there is a need within complex systems for a safe and low-risk system (Garwood & Poole, 2018). In general, there is still no comprehension of the dynamics of the technology development process from the management perspective. In order to create the necessary integration and coordination between processes and technology development activities to improve its success, there is a need to provide a management model that guides the development of projects in the shortest possible time (Todorovic et al., 2015).

A critical aspect of project management is the selection the project manager as the custodian of the project. The selection of a project manager with insufficient skills will influence the feasibility studies of starting the project, and various other activities such as planning, scheduling, resources allocation, time and cost. (Bjarnason, 2015).

Knowledge of project management is a tool which assists the project managers, so that the project can be carefully managed, directed, and resolved when problems occur; the project management knowledge also allows project managers and team members to fully carry out the process of implementing possible changes in different aspects of the project; subsequently the possibility of documenting project events from the beginning to the end to take advantages of the experience gained will be available to the project team in the future projects (Todorovic et al., 2015).

According to Almgren (2014) project management processes are done by individuals and usually fall into one of the two main categories: project management processes that describe, organize, and complete the project; and project management processes that are available for most projects at most times. He mentioned product-oriented processes that identify and create the project's product and product-oriented processes are often defined by the life cycle of the project and vary with the change of application field. Project management processes and product-oriented processes overlap and interact across the project. For example, a project's scope cannot be defined without having an initial understanding of the method of using products.

According to Papke-Shields and Boyer-Wright (2017) the advantages of using project management are: better financial, physical and human control; better relationships with customers; shorter completion times; low costs; high quality and more reliability; high profit margin; more productivity; better internal coordination; promoting work impetus; and high probability of project success.

2.4 Time and Cost in Projects Planning

Each project's performance depends on cost, time and quality that examination of them significantly assist managers to control and plan projects (Asad Mir & Pinnington, 2014). Although academic literature addresses the balance of time and cost and the mathematical methods of solving them, limited research have been done to identify the factors affecting cost, time, and quality in the success of project (Sanchez, Terlizzi, & De Moraes, 2017). As mentioned by Pehlivan (2013) for implementing a project it is necessary the operations be performed in accordance with existing resources and activity time can be considered as a function of available resources; In addition, the project quality is also a function of time and cost factors, as well as different resources have different costs and qualities; In this case, the planner or project manager needs to set a balance between the cost, time and quality of the project.

Colin and Vanhoucke (2014) state that the timely completion of any project in terms of design, optimum quality and predicted costs are some the main criteria for predicting project success and failure. Timely completing the project with predicted cost will result in failure of the employer's requirements and the objectives of the design or project. The authors argue that an increase in time and cost in order to complete a project will result in non-profit losses incurred by the benefit. In many cases, even overdue delays in the project or design will not justify the economic and technical viability of the project. An extension of the project completion period leads to an increase in overhead costs. Inflation created on the market increases the cost of doing unplanned activities. The likelihood of performing similar projects by competitors and the loss of the market will increase the justification of the project in the new market. New technologies may be enter the market, and then the probability of finding the materials and the equipment needed for the design or the lack of justification for their use will rise. In other words, the losses caused by the lack of timely completion of the project impose significant costs on the project or design. Sometimes these costs are so high that a project or design will no longer be justified (Chen et al., 2016).

According to Badewi (2016) various methods have been proposed to optimize the time and cost of project activities. This can be divided into two main categories: innovative, and mathematical. The sample of the innovative method is: the fundamental method, structural method for calculating project cost by Prager, Siemens, effective cost gradient model, and Maslehi's hardness method; these methods resulted from the practical approach of researchers solving the time-cost balance problem and their efforts in providing suitable algorithms for problem solving. Badewi (2016) said the models of the Harold Kelley's linear planning method, the linear planning method of Hendrixson, the integer planning method for Mayer and Schaffer, and the integer planning method of Paterson and Huber are the proposed mathematical models by the researchers in which the time-cost balance problem is optimized with a mathematical programming model. Therefore, in these methods it is possible to choose a combination of different options for carrying out activities at any time, which are among the combination optimization problems and most difficult problems to optimize. So far, many models have been developed in the field of mathematical planning for optimal balance on three factors of the project. Dvir and Lechler (2004) in their paper by proposing a crashing hypothesis design of activity assumed that when the time of an activity decreases, the cost increases with a linear gradient and the quality decreases with a linear gradient.

The issue of scheduling a project is to determine a timetable for a set of related activities that constitute the project; the timetable should be determined in such a way that, while meeting the preconditions and resources constraints, the desired cost function is optimized (A. Martens & Vanhoucke, 2017).Timing control is the process of monitoring on the project's necessity in order to update the progress and manage the changes in the project's scheduling baseline. Timing control is relevance with updated project timing - detecting and reporting the factors creating deviation and the deviation compensation program; and identifying and reporting factors that can cause scheduling changes (Bjarnason, 2015).

An important aspect of controlling the timing is the determination of the cause, the timing baseline deviations rate and the decision on the necessary measures. Since the 1691, researchers have been exploring the issue of scheduling project in confident and uncertain environments (Sligo et al., 2017). Anderson, Asdemir, and Tripathy (2013) presented the relationship between the project cost and the duration of the project activity, and designed the theories about the type of project schedule's problem with the goal of reducing the total cost. Nevertheless, due to ambiguity in the time and duration of the project activity, uncertainty has always been as a problem in project timing.

Bjarnason (2015) make mention of probability theory in the project-timing problem introduced in 1691; in addition, he examined the problem of scheduling a project through planning with a payment probability limit so that the maximum completion time reduces under the limitation of time probability. (Anderson et al., 2013) presented the expected value model in the simple type solution of the project-scheduling problem.

According to the Prabhakar (2008) the successful project is to be conducted with the lowest cost, in the shortest time to a highest quality, and changes in the three factors of time, cost, and quality depend on each other and conflict with each other due to resource constraints and other constraints that exist in each project. He mentioned for this reason, creating an optimal relationship between time, cost, and quality is one of the major goals in each project; and generally, for each activity in the project, there are several implementation models, each of which has different time, cost, quality and quantity of resources.

2.4.1 Time Management

Papke-Shields and Boyer-Wright (2017) said management is a method of doing the works of a social or industrial organisation economically, administratively, politically, and socially; The superior skill and the main task of the manager is to balance health and survival of the organisation, and one of the most important variables to achieve it is the time management. According to Pehlivan (2013) with the development of technology and science, the importance and value of time have also increased, and one of the best ways to control the time is to use time management intelligently and constantly; The time management allows people to find the value of their time. The author state that the highest priority in time should be allocated important tasks usually not associated with urgency In addition factors leading to waste of time should be avoided. According to Grissom, Loeb, and Mitani (2015) the principles of time management is: goal setting- objectives must be set to succeed in each work, and the level and context of the goals must be specified in the stage of setting goals, also objectives must be specific, clear, precise, organized, measurable and realistic; priority setting- if there are numerous goals, priorities should be considered; observe priority-time management is benefit that works are done according to the priority levels. In fact, until more important work is not done, it is not necessary to do much less important work.

2.4.2 Cost Management

According to Smith (2014, 2016) project cost management involves processes required to manage sure spending the approved budget. These processes involve resource planning (people, equipment, materials), cost estimates of the required resources, cost allocation

towards each work activity, and finally cost control to accommodate changes in the budget allocated to the project. The authors argue that these processes interact with each other as well as with processes of other areas of knowledge. Based on the needs of the project, each process may involve the efforts of one or more individuals or groups; and typically, at least once per project phase, one process takes place.

Estimating the cost to complete activities is a prediction based on known information at a point in time, that for each activity in project must identifying cost of start and completion (M. Anderson et al., 2013). Cost estimation also includes cost exchanges such as construction versus purchases, purchases versus rent and sharing resources in order to achieve optimal project costs. Developing an approximation of the required financial resources helps with completing project activities (Chen, 2015). It can be said that cost estimation is a quantitative assessment of the probable costs of resources for the completion of the activity. To estimate the cost of the project, there are three affecting factors such as inputs, tools and techniques and outputs (Khodakarami & Abdi, 2014).

2.5 Stakeholder Theory

Stakeholder theory was introduced in 1986 by Edward Freeman in the academic publications of management science and introduced social capital as a new concept(Miles (2017). The social capital of an organisation is the better and less affordable access to resources of the community, such as workforce, professional credentials, social service groups and the media. From the perspective of stakeholder theory an organisation uses social capital to create value and facilitate the transaction between its internal and external stakeholders. Social capital increases when the form and manner of relations between the organisation and its stakeholders will stimulate and enhance the interaction, cooperation and understanding and agreement between them. In this perspective, stakeholders effect on the organisation and get effect from the organisation in the framework of a network model.

Freeman completed the stakeholder theory by designing a graphic representation called the stakeholder model. The stakeholder model was initially developed to identify the various groups of society that are directly influenced by the decisions made in the business and, on the contrary, have the potential to affect the success or failure of the organisation (Harrison and Wicks (2013). Crucke & Knockaert (2016) mentioned some theorists concluding that an organisation from an economic and moral perspective does not belong solely to its own stakeholders, but also to external stakeholders that are economically linked

to the organisation. Freeman (1994) said framework of his stakeholder model illustrates the relationships between the various groups of individuals who play role in and out of the organisation.

The attainment of the goals of each organisation requires identifying individuals and groups that have an impact on the peripheral environment of the organisation and the organisation itself. Therefore, an organisation can adjust their business activities to satisfy expectations of others effectively with recognizing the expectations of the individuals and groups that influence them, to satisfy expectations of others. Using this method, an organisation can clearly identify its needs and expectations from other organisations, individuals and groups and can provide the appropriate structure to achieve their goals (Fonseca, Ramos, Rosa, Braga, & Sampaio, 2016).

In relation to two facts including the expectation of the organisation from others and the expectation of others from organisation, it is necessary for each organisation to consider the following notes; first, since the organisation should meet the needs and expectations of its customers to achieve its goals must be an appropriate comprehension from these needs and expectations. Second, the customer may be internal or from external organisational units. Each organisation should meet the needs and expectations of the individuals and groups such as stakeholders, the business owner, managers and employees of the organisation who have income and profile from the organisation (Miles, 2017).

According to Freeman (1994), the objectives of designing and use of stakeholder model are: Identification of the expected benefits of stakeholders, in particular those who are in the public sector (peripheral community of business); providing appropriate situation to long-term growth and constant business; and more attention to the business profits in compared with the monetary value of profit which is achieved from the business.

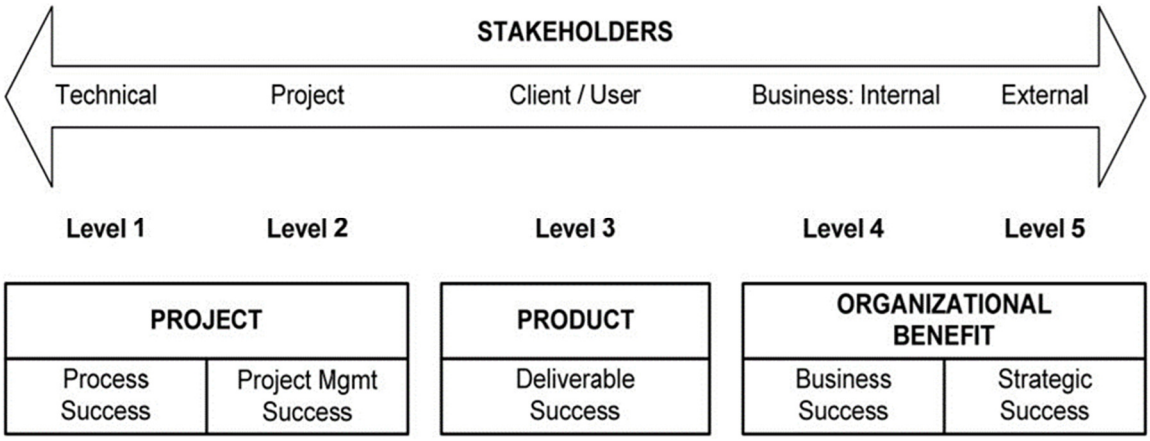
Freeman (2004) believed the most important use of stakeholder model is to help the senior managers of organisations respond all stakeholders of organisation. Important thing that should be noted in the stakeholder model is the level of analysis in the organisation that has different and independent units. In such organisations, the first level of analysis is to investigate the relationship between the internal units and domestic stakeholders and the second level of analysis is to examine the relationship between internal units and other stakeholders, external stakeholders.

2.6 Project Success Framework

Bannerman (2008) suggested a multilevel framework of project success based on key milestones in various times of the project and from various stakeholder views and the success of a project is represented by the highest level of benefit delivered by the project at each point of observation as shown in Figure 1.

Level 1 represents process success where the success is the appropriateness of the used processes and methods, their harmony with the project's goal, and their effectiveness and combination to provide the results of project. 2) Level 2 refers to project management success and is representative of the traditional paragon for a successful project defined with key project design parameters (for example, Schedule and budget). 3) Level 3 represents product success which focus on the successful delivering of major project deliverables.4) Level 4 refers to business success which follows upon completion of the project aims and objectives, approval of the investment and realisation of the predicted benefits.5) Level 5 represents strategic success which measured based on net improvements in industry position, competitive advantage, and/or another strategic profit.

Figure 1 - *Multilevel framework of project success*



Source: Bannerman (2008)

2.7 Factors of Success and Planning

Based on the literature reviewed, significant researches have been carried out by various scholars about the affecting factors of success and planning of the project, which here some of the researches mentioned in this regard.

Mazzarol (1998) separated the success factors in two categories of technical and strategic. Holland, Gaston, and Gomes (2000) developed a model of success indicators of

developing new product including 11 indicators such as having structured process and clear insight; developing products and release in into the market; long-term vision of processing and optimizing team skills, understanding the market and its dynamics; The support of senior management and implementing leaned lessons from the previous projects; And preparing the project team, maintaining the team members with experience related to the product developing projects.

Cooke-Davie (2002) argued that there is a specific and positive relation between the amount of effort we take for setting project goals and job requirements and product technical characteristics and the success of the project in the other side and should not attempt any effort at the initial stage of the project and the idealizing stage of the project for defining project goals and reachable requirements and this desire is not realizable without involving the customer with the final beneficiary.

Mendoza, Marius, Perez, & Griman (2007) introduced 15 main factors in this area such as:

- Proper understanding of the project and the project team and its necessary capabilities and competencies;
- The existence of effective communication in the project is a realistic estimate of the time and cost of the project's proper project control project;
- The effective communication in the project, realistic estimation of the time and cost of the project and proper and adequate project control;
- The customer's involvement and participation;
- The ability of the project team to manage risks, having sufficient resources, team-work spirit and appropriate planning for the project;
- The top manager's support, stakeholders' participation and appropriate involvement in the project and appropriate authorities for project managers;
- And the impact of external factors on the ability to solve Problems of the project.

Two researches were carried out in 2011, one by Kr Singh and another by Chittithaworn, Islam, and Yusuf. They were about factors of success in Small & Medium Enterprises.

Chittithaworn, Islam, and Yusuf (2011) and Kr Singh (2011) carried out a research in 2011 about factors of success in Small & Medium Enterprises. Table 1, show the key factors of success from both point of view. Table 1, show the key factors of success from both point of view.

Table 1

The key factors of success from Kr Singh and Chittithaworn, Islam, and Yusuf

Success from Kr Singh's point of view	**Success from Chittithaworn, Islam, and Yusuf's point of view**
Employees ambition	Exact definition of mission and the objectives of the project
Senior manager support	Senior management commitment
Group motivation	Exact timing and planning
Clear objectives	The commitment of the employer and other project stakeholders
Suitable technology	Appropriate project group
Technical expertise	Technology and technical expertise
Employer support	Customer acceptance
Financial support	Controlling
	Appropriate communication
	Risk management

Source: Own research

The results of these two studies indicate that in the discussion of the success factors of a project, not only attention should be paid to technical and internal factors. Without considering the environmental, organisational and behavioural factors, one cannot provide an adequate analysis of the success or failure of each project. Of course, it should be kept in mind that identifying and managing these factors does not guarantee the success of the project, but it increases the likelihood of success; therefore, to ensure success, all effective factors must be identified and managed. (Chittithaworn et al., 2011; Kr Singh, 2011)

In a research conducted by Haleem, Sushil, Qadri, and Kumar (2012), out of the 54 initial success factors that they recognized, eight factors have been identified as the main drivers of success. These factors are in the four steps of new product development. First step: Defining the exact meaning of target market (the formation of the initial idea and conceptual design), the application of qualitative standards, transparent objectives of the project, and considering the important issues in the early stages; second step: (definition of product and its specification), internal communication in the project team; third step: Providing the prototype and developing it, on-time delivery of the product to the customer, on-time start up, production cost; and the fourth step is commercialization of the product.

Habib (2013) considered the following reasons for failure of the projects: Defective project management, lack or weakness of planning, wrong leadership, non-transparency of the range of inappropriate group, ineffective control, weak communication and unreal timing. In another study by Ofori (2013), critical success factors are divided into human resources, development resources, evaluation resources, and start up resources.

Williams, Ashill, Naumann, and Jackson (2015) identified five factors as key success factors: Communication and consultation with the employer, detecting the complexity of the project, Commitment to the customer, a flexible approach to change, managing the external factors. Sanchez, Terlizzi, and De Moraes (2017) and Radujkovic and Sjekavica (2017) extracted four key success factors for the project: Marketing research; information and communication; planning (time, cost, and quality); and supply chain.

2.8 Conclusion

The importance of planning and success of project is confirmed by the literature review. These findings have value, however, the positive relation between planning and success of project was not clarified. Thus, this research can add to the current body of knowledge, and help stakeholders of projects to understand the nature of the relation between planning and success of project. Studying the literature shows success factors are common across different project types and project management processes, tools and systems have been developed but project success has not significantly improved. This problem makes doubts about the value and effectiveness of Project Management and Project Management systems. Moreover, the literature review showed that success of project is linked to the satisfaction of project stakeholders. This review also tried to discover how the relation between planning and success of project could be improved. The literature review also noted that the utmost effective method to measure the project success is based on how both time and cost management can satisfy the project manager.

Chapter 3: Research Hypotheses

3.1 Introduction

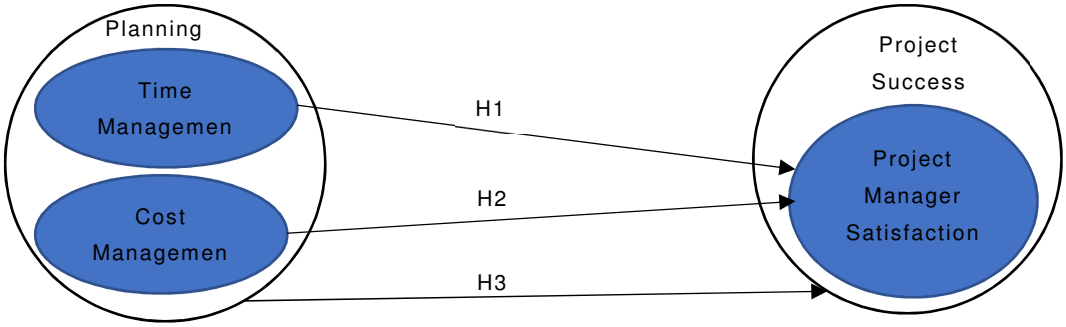
An assumption of this research is that planning (cost and time) has a positive relationship with the success of project (satisfaction of project management as a stakeholder). For the objective of this research three hypotheses was considered under variables: time management, cost management and project managers satisfaction. Based on the traits that the definition shares with stockholder theory, The project success framework was chose. (Bannerman, 2008). Project manager satisfaction as one of the constructs for the stakeholders was defined as an item to measure the success of a project (Rezvani et al., 2016); it is closely related to the time and cost management, where they satisfied project managers (Asad Mir & Pinnington, 2014).

3.2 Research Hypotheses

Based on the literature reviewed in Chapter two the satisfaction of stakeholder is equal to project success (Fonseca et al., 2016; Harrison & Wicks, 2013; Heravi et al., 2015; Schnackenberg & Tomlinson, 2016), and based on the stakeholder theory the project management is one of the stakeholder of the project (Freeman, 1994, 2004; Miles, 2017); therefore, the project management satisfaction is a construct of project success. Then based on literature reviewed, project management success is equal with project management satisfaction (Ofori, 2013; Radujkovic & Sjekavica, 2017); and according to project success framework (Todorovic et al., 2015), the success of project management is related to the tools, the same as the time management and cost management, that based on the literature reviewed, they are the constructs of planning.

According to literature reviewed, Figure 2 shows the conceptual model of the relationships between sets of dependent and independent variables for hypothesis one, two and three:

Figure 2 - *Conceptual model*



Source: Own research

3.2.1 Hypothesis One

- $H1_0$: There is no statistically significant positive relationship between time management and satisfaction of project manager (as project success).
- $H1_A$: There is a statistically significant positive relationship between time management and satisfaction of project manager (as project success).

3.2.2 Hypothesis Two

- $H2_0$: There is no statistically significant positive relationship between cost management and satisfaction of project manager (as project success).
- $H2_A$: There is a statistically significant positive relationship between cost management and satisfaction of project manager (as project success).

3.2.3 Hypothesis Three

- $H3_0$: There is no positive statistical relationship between planning and success of project.
- $H3_A$: There is a positive statistical relationship between planning and success of project.

3.3 Conclusion

It is expected that the relationship between planning and success of a project will be realised through the testing the three above hypotheses; the methodology used to achieve a result about the hypotheses will discuss in the next chapter.

Chapter 4: Research Methodology

4.1 Introduction

This chapter is devoted to the research methodology, which describes the statistical population, statistical sample, data collection method and data collection tool. The choice of research methodology depends on the nature of the research variables that can be measured. The variable nature of this research was related to the planning and success of the project. The research philosophy for this study was positivism, as it seeks to investigate the nature of variables which relate to planning and project success that are measurable. The main distinction between quantitative and qualitative studies is their flexibility (Mack, Woodsong, Macqueen, Guest, & Namey, 2005). A quantitative research method was selected in this study as an objective measurement, with the statistical analysis of data that was collected through questionnaires (Yilmaz, 2013).

4.2 Methodology

According to data collecting method, this was a field survey research and considering the nature of the results, it was a descriptive survey research. Study the relationship of planning and project success is the main objective of this research. According to its results, this was an applied research and in terms of variables, it includes qualitative variables and was placed in the category of descriptive research and was done through surveys.

Based on hypothesis testing, this research uses inductive methods and emphasizes whether there was a positive relationship between time and cost management and project success. The method used in this research was based on descriptive research method. In the first stage, it was attempted to design a research pattern using a descriptive method and the previous researches in this field, and then using relevant software, the results were analysed (Creswell, 2013). The method of collecting information was through field-library method and the data collecting tool in this research was a questionnaire.

4.3 The Statistical Population of the Research

The population refers to a complete number of all items focused on within an inquiry or study. This research embraced a group of bodies that share common characteristics from which vital information that was obtained (Kothari, 2004). For this research, the population

under consideration was professionals, middle, senior, and junior project managers who have undertaken projects. As a target population, questionnaires were sent to project managers (professionals, middle, senior and junior) operating globally. Extending the research across all levels of employees could decrease the reliability and validity of the results due to a shortage of experience at lower levels and lack of project management credentials. In contrast, minimum variation in data collection methods homogenises the population group to enable reliable and comparable data based on a small like-minded cohort (Kumar, 2011)

4.4 Unit of Analysis

The sampling unit could be a single or a set of observation units (Kothari, 2004). Thus, the unit of analysis for this research was managers of projects (professionals, both middle, senior, and junior). According to the limitation to access sufficient number of project managers, this unit of analysis was not limited to a specific geographical area and project type, and could cover all types of projects anywhere in the world.

4.5 The Sample Size

Sampling helps to create low-cost results that represent the entire population but contacting a wide and large population is difficult and when one cannot access the complete list of the population, the proper method of sampling is a non-probability sampling (Kumar, 2011). In this research it was not possible to administer questionnaires to all the project managers around the world too. Was used Purposive sampling technique (non-probability) to choose project managers (first from companies in South Africa), as it used judgment to identify such respondents based on experience, involvement level in projects, and institutional authority. The focus was on project managers in IT, services, government, utilities, consultancies, construction, automobile, mining, and petrochemical sectors. Snowball sampling method was used as a secondary technique to grow the number of respondents (Saunders, Lewis, & Thornhill, 2009).

As mentioned by Schonbrodt and Perugini (2013), in quantitative research the sample size is critical for precise and proper data analysis, and to suggest feasible recommendations from the results. According to Kline (2011) in order to foster a statistical generalization of the results, a minimum participant-to-variable ratio of 10:1 is generally acceptable, requiring this research to use 190 respondents; However he mentioned, for sufficient generalizability one needs a sample ratio of 20 to 25 participants per measured variable. This research

aimed to collect between 150 to 200 responses. But, the precise number of respondents were unpredictable from the onset (Schonbrodt & Perugini, 2013).

4.6 Measurement Instrument

Gathering of data is the one of the most important parts of each research. If data collection was done regularly and correctly, the analysis and conclusion of the data were done with greater accuracy and speed. Four main methods are used to collect data in research work: use of existing documents, observation, interviews and questionnaires. In this research, the data collection tool was a questionnaire that the researcher created as to measure the variables based on existed researches.

4.6.1 Questionnaire

The questionnaire, as one of the most common tools for collecting information in survey research, is a set of target-oriented questions that measure the views and insights of a respondent using a different scale. Questionnaires are usually referred to as structured interviews as they are a cost-effective, structured and manageable way of collecting standardised data or the same things from a wider population. After the desired questionnaire is prepared and the sample people are selected, the questionnaires are distributed (Saunders et al., 2009; Wilkinson & Birmingham, 2003) In this research the questionnaire comprised five parts. The first part of questionnaire, was an introduction that shows the goals and the advantages of undertaking this study. The second part (A) was based on questions about demographics to identify the suitability of respondents. The third to fifth (B to D) includes questions that present participants' views about the stated hypotheses. Table 2 show the relation of each part with literature review.

Table 2

Questionnaire link to literature review

Question	Based on
1	General (Written by the researcher – was not used during analysis)
2 -9 (A)	Demographics (Written by the research form, based on existing researches)
10-16 (B – H1)	Time Management: Badewi, 2016 Grissom, Loeb, and Mitani, 2015
17-22 (C – H2)	Cost Management: Badewi, 2016 Smith, 2014, Smith 2016 Chen, 2015
23-29 (D – H3)	Project Success: Badewi, 2016 Sanchez, Terlizzi, and De Moraes, 2017 Fonseca, Ramos, Rosa, Braga, and Sampaio, 2016
30	General (Written by the researcher – was not used during analysis)

Source: Own research

4.6.2 Questions of the Questionnaire

The first priority of a questionnaire is to determine the desired variables to measure. Making practical the basic concepts had a decisive influence on the outcomes of the research results. The measurement scale used in this study was a five-degree Likert scale. First, this scale was scored according to the Table 3 in order to measure the research questions. Then the total score for each construct was calculated.

Table 3

Five-degree Likert scale of questions

Strongly Agree	Agree	Neither agree Nor disagree	Disagree	Strongly Disagree
5	4	3	2	1

Kumar, 2011

4.7 Pre-test

A pre-test in the same condition possible to the study was needed to check if the survey was designed suitably for participants, appropriate time was set for completing it, the instructions were cleared, and anything that could impede collecting accurate data. The participants of this pre-testing were potential respondents and also specialists in question

construction, who may be able to find out potential difficulties which might found in a pre-test with respondents.

The pre-test was done with 25 project managers in the different level than were selected from the network of the researcher, and they were accessible to discuss. The link of online survey was sent to them by email and social network, and 19 responds were received, so the rate of responding was near 75%. The respondents spent approximately six minutes to answer the whole online questionnaire. It was possible for all respondents to read questions quickly, understand their intent, and select an answer easily. An informed consent was acquired from respondents willing to contribute to the survey.

4.8 Data Gathering Method

According to Kumar (2011) the data-gathering step was the beginning of a process in which the researcher collected field and library findings and classified them in an inductive fashion, then analysed them and evaluated and formulated hypotheses and ultimately judged the outcome. Afterwards, the researcher found the answer to the problem by relying on the truth to be revealed. Therefore, the credibility of the information was very important to prevent invalid information as to discover the truth and reality because the desired issue was not well formulated by the researcher (Kothari, 2004).

A questionnaire was used as a tool for information gathering according to the subject variables and the relationship between the research components, and the researcher compiled the required data in the research. An online survey used as a survey tool, which the uniquely link of the questionnaire sent via email and social networks the same as LinkedIn, WhatsApp, and Telegram to respondents. The online survey hosted by Survey Monkey as a surveying tool. The questionnaire was written in English. The assumptions for the online survey only allowed the survey to be taken once from the same device and the respondents will be anonymous and IP addresses do not show in survey results.

4.9 Scale of Variables and Level of Reliability

The time management as an independent variable (construct for planning) was scored based on a five-point Likert scale according to existing questionnaires (Badewi, 2016; Grissom et al., 2015) from 1: strongly disagree to 5: strongly agree, with range 0.79 (Grissom et al., 2015) to 0.86 (Pehlivan, 2013) for Cronbach alpha's, implying acceptable levels of reliability.

The cost management as an independent variable (construct for planning) was scored based on a five-point Likert scale according to existing questionnaires (Badewi, 2016; Smith, 2016) from 1: strongly disagree to 5: strongly agree, with range 0.77 (Chen, 2015) to 0.82 (M. Anderson et al., 2013) for Cronbach alpha's, implying acceptable levels of reliability.

The project management satisfaction as dependent variable (construct for project success) was scored based on a five-point Likert scale according to existed questionnaires (Badewi, 2016; Fonseca et al., 2016; Sanchez et al., 2017) from 1: strongly disagree to 5: strongly agree, with 0.70 as minimum value of Cronbach alpha to acceptable levels of reliability (Fonseca et al., 2016). Other research (Sanchez et al., 2017) reported 0.72 as Cronbach's alpha for project management satisfaction.

4.10 Data Coding

For transfer the data from questionnaires to the software that used for statistical analysis, was used the numerical symbols that were assigned to the items of questionnaires. Tables of coding were prepared to identify a meaning of each code on the questionnaire and their gathered data, that can be view in Appendix 1. The variables of demographic were coded based on their values with the nominal and ordinal; And for record the responses to the variables was used the Likert scales, that they were coded with interval data.

4.11 Data Cleaning

The respondents and their responses were removed from the analysis if the respondent did not answer any of the questions. Based on it from only 174 out of 190 were acceptable. If the standard deviation of the score was calculated as zero then the respondents and their responses were also removed, because it means that a person answered the same to all questions about the variables (Part B, C, and D), therefore classifying the respondent as not reliable., 27 respondents were removed out of 174 resulting in the final count to be 147 to be used for data analysis.

Also, a main assumption existed to accept the responses of respondents; the respondent experience must be in professional, principal, senior or junior management level, that all 147 respondents met this assumption.

4.12 Data Analysis

For analysing and modelling the coded data, descriptive and analytical statistics tools were used in IBM SPSS software version 25, and used IBM Amos version 25 and Microsoft Excel version 2016. Data was displayed through tables and charts for the ease of analysis and reading.

4.12.1 Remove Outliers and Normality of Distribution

A Mahalanobis distance measurement and the critical chi-square value, can identify outliers. To specified the value of critical chi-square, was used the degrees of freedom that determined based on the number of items in the questionnaire (Pallant, 2011). Based on 20 independent variables and p-value of 0.001, and resultant critical value used was 45.315. From the 147 selected responses, eight were removed as outliers (with a Mahalanobis distance greater than 45.314) and 139 was ready for analysis.

As mentioned by Cain, Zhang, and Yuan (2017) according to size of sample of this research, between 50 and 300, the item has normal distribution if the skewness is in a range of -1.5 and +1.5, and the kurtosis is in a range of -2.5 and +2.5. Based on it for all questions (with 139 respondents without any missing data) all were within the normal distribution. Also, (Bulmer, 1979) mentioned that a distribution is justly symmetrical when values range between 0 and 0.5, and it is moderately skewed when values ranging between 0.5 and 1.0, and it is highly skewed when the skewness value is bigger than 1.0. (Bulmer, 1979) mentioned that with kurtosis of three a distribution is normal, and anything more than three is described a leptokurtic and anything less than three is represents platykurtic distribution.

4.12.2 Validity and Reliability

Reliability and validity can influence the quality of the data you obtain, based on it, they were checked first. The reliability of a scale indicates how free it is from random error, and the validity of a scale refers to the degree to which it measures what it is supposed to measure. The principal component analyses (PCA) is a method to identify patterns in data, and also to detect the correlation between variables. Exploratory factor analysis (EFA) is a method to identify the underlying relationships between measured variables (Pallant, 2011). This paper used PCA and EFA with a varimax rotation.

At first, the Kaiser-Meyer-Olkin (KMO) index and Bartlett's test of sphericity were checked to specify if factor analysis was a feasible option and checked the validity. The KMO ranging

from 0 to 1 as an index for a measure of sampling competency was used, and 0.6 was suggested as the minimum value of it for proper factor analysis (Cain et al., 2017). Also, a Bartlett's test of sphericity was used to recognise the suitability of the data for factor analysis, and it is significant if p-value is less than 0.05 at a 95% level of confidence (Pallant, 2011). Based on the Kaiser's criterion, for the total sample, the quantity of variation that calculated by each component is measured by eigenvalues; As next step, the components with eigenvalues greater than 1.0 were selected as the main component that show more variance than any variables (Ho, 2006).

As mentioned by Yong and Pearce (2013), an EFA with a Varimax rotation to find the number of factors influencing variables and to analyse which variables 'go together'. Then as it was said in section 4.9, to check the reliability and internal consistency, using the Cronbach alpha with 0.70 as minimum value of coefficient that be reflective of excellent reliability (Fonseca et al., 2016; Grissom et al., 2015; Sanchez et al., 2017; Smith, 2016) .

4.12.3 Structural Equation Modelling (CFA/ Measurement and Structure Models)

Structural Equation Modelling (SEM) is a technique that effectively includes a whole range of standard multivariate analysis methods, similar to an analysis of variance, regression, and Factor analysis to indicates the relationship of the observed variables (Nachtigall, Kroehne, Funke, & Steyer, 2003). Also Coromina (2014) mentioned that a SEM can assess relation between variables (observed and unobserved/ Independent and dependent) with the path specified between them. The researcher used IBM SPSS Amos (Version 25) as the preferred structural equation modelling software.

Based on the EFA result obtained, a measurement models were prepared with Confirmatory Factor Analysis (CFA). The measurement model was developed for goodness of fit and explored for a factor structure, consisting of various scales. According Hox, J. J. and Bechger (1998) and Adelson (2012) the measurement model is fit when the parameters met the criteria in Table 4. Validity is met when the Average Variance Extracted (AVE) is bigger than 0.05. Reliability is achieved when the Composite Reliability (CR) is bigger than 0.7 (Coromina, 2014).

When the model fails to fit, one of the ways to improved model is through correlating the error terms of the various variables. This allowed other issues that were not specified within the model to be captured due to covariation (J. C. Anderson & Gerbing, 1988); In this case the researcher re-specified model to improve the relationship between the various constructs.

Table 4

Acceptable criteria for Structural Equation Modelling (Measurement and Structure)

Parameters	Acceptable criteria
CMIN/DF	<3.00
RMR	<0.09
AGFI	>0.80
TLI	>0.95
CFI	>0.95
RMSEA	<0.05
PCLOSE	>0.05
HOELTER 0.05	>130

Source: Adelson (2012); Hox, J. J. and Bechger (1998)

According to the final fitted measurement model the final factors and items were specified. Then, the initial Structural Model was prepared. After that, the final structural model was improved and made ready to check hypothesis by statistical technique. The summary of the steps for SEM that were done by researcher showed at table 5:

Table 5

Summary steps applied by researcher for Structural Equation Modelling

Step	Description
1	Developed a theoretical model; It involved a full understanding of the model, variables (relationships and directions of relationships), and the main theory that describe the model (to defend the analysis).
2	Was created the path diagram for the causal relationships by using IBM SPSS AMOS (Version 25)
3	Models were prepared; first Measurement model to show the relationships between each construct and their indicator variables, then a structural model to identify and analyses the relationship or path between constructs (independent and dependent variables).
3-1	Outcomes evaluated for suitability and model fit; SEM generates a diversity of indices to measure model fit simultaneously, the researcher selected the most appropriate measures that showed in table 4.
3-2	Models were modified (theoretically was justified) - It was necessary to re-specify and modify the models in different steps until passed all acceptable criteria, validity and reliability.

Source: Own research

4.12.4 Statistical Tests to Explore Relationships among Variables

Statistical testing to explore relationships among variables were based on the final fitted structural model. According to Pallant (2011), the two-tailed Pearson correlation should be used to explore the strength of the relationship between two continuous variables. He mentioned the coefficient (r) could be positive or negative, between -1 (as a perfect negative correlation) and +1 (as a perfect positive correlation); The positive means: one variable increases as the other increases, and the negative means: one variable increases

when other decreases; If the P-value is less than 0.05 at a 95% level of confidence, it indicates the correlation as statistically significant.

This research used standard multiple regression to explore the relationship between one continuous dependent variable (project success) and some independent variables. Before a regression analysis can be conducted, data should pass the following main assumptions. (Pallant, 2011):

- Sample size: For multiple regression the generalizability is needed and therefore not suitable for small samples. About the number of cases that required for multiple regression, different methods recommended by authors, for example Pallant (2011) said N must be bigger than "50 + 8*m" that m is a number of independent variables. Based on it, data of this research with two independent variables passed this assumption (Final sample size is 139 out of an original 190 respondents).
- Multicollinearity and singularity: This refer to the relationship between the independent variables. Multicollinearity is present when the independent variables are highly correlated (correlation coefficient is above 0.9); and singularity occurs when one of the independent variables are created out of other independent variables (Bulmer, 1979; Pallant, 2011). Pallant (2011) mentioned multicollinearity can be checked by measuring the Variance Inflation Factor (VIF), which must be less than 10.
- Outliers: Multiple regression is very sensitive to outliers (Creswell, 2013). As mentioned earlier, at part 4.12.1, by inspecting the Mahalanobis distances all outliers removed from the dataset before starting the analysis, so data of this research passed this assumption.
- Normality, linearity, homoscedasticity, and independence of residuals: Each data point has one residual that is a difference between a score of the obtained and the predicted dependent variable that the sum and the mean of it are equal to zero. Researcher checked the normality, linearity, homoscedasticity, and independence with residuals scatterplots (Pallant, 2011) and the data of research passed all of them.

Calculated the R Square, which is a measure of how much of the variability in the outcome is accounted for by the predictors. To investigate the effect of the independent variables on the dependent variable, used a two-way analysis of variance (ANOVA). If the p-value (Sig. F Change) is less than 0.05 at 95% level of confidence then it means the model is good fit. Durbin-Watson statistic informed researcher about whether the assumption of independent

errors is tenable; Based on T. W. Anderson (2003) if the Durbin-Watson is between 1.5 and 2.5 then no auto-correlation existed.

Then the beta was specified (as regression coefficients) to show the strength of the relationship between the dependent variable and each of the independent variables. To compare the different variables the standardised coefficients beta was used but, for constructing a regression equation, the unstandardized coefficient beta was used (Creswell, 2013). If the t-test associated with a beta value is significant (the p-value /Sig. is less than 0.05 at 95% level of confidence), it means that the predictor is making a significant contribution to the model.

Evermore are possible erroneous outcomes are created because of statistical analysis, and he mentioned must avoid two types of error.; Type I error is rejected when the null hypothesis is true and type II error happens when you fail to reject the false null hypothesis; (T. W. Anderson, 2003; Pallant, 2011; Trochim & Donnelly, 2006).

4.13 Limitations

The following limitations were identified:

- Part of the population were not selected due to the limitation on access to all project managers. But snowball sampling method was used (as a secondary technique) to increase the likelihood of access; primary respondents sent the survey, likely, to the persons were similar to them (as requested by the researcher).
- According to the limitation of time and access to information, this study only focused on project managers that were one of the key stakeholders of projects. But, it was tried to cover all level of project managers.
- The results of this study focused on a survey that was a static cross-sectional, and was limited to a static view. Thus, the mood of respondents could impact how they respond.
- The research examined the effectiveness of time and cost management (as constructs of planning) on project management satisfaction (as construct of project success). This could be subjective and may differ from one responsible and accountable person to another.
- The findings of the research were consistent with the theory but it is possible that only demonstrated part of the truth in the relationships between planning (time and cost management) and success of the project (project management satisfaction).

- Influence of the researcher; the researcher is an employee in planning and project management, but he tried to stay neutral.

4.14 Conclusion

In this chapter tried to describe the details of the methodology that employed in this research. Were used the quantitative research methods to measure variables and test the hypotheses, based on the data from the surveys (within a cross-sectional timeframe) that was completed by the project managers. Correlation, multiple regression, factor analysis, and structural equation modelling included validity and reliability for all measurement scales were used to find a significant relationship exists between the variables. The next chapter gives a detailed of associated results.

Chapter 5: Results

5.1 Introduction

This chapter presents the outcome of the analysis of the data that collected by the quantitative survey in alignment with the identified hypotheses in chapter three and based on the methodology that explained in chapter four. The purpose of this research was to assess the hypothesised relationship between planning and project success.

5.2 Sample Description

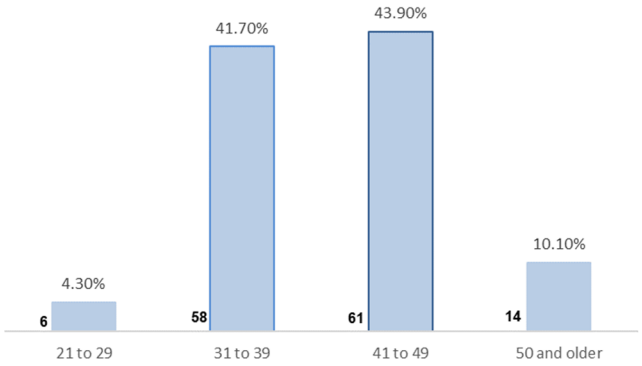
Between 15/August/2018 until 24/September/2018, 190 responses were received from 220 distributed surveys, thereby giving a 86.4% response rate. After coding the received responses, 16 responses were removed from the dataset because respondents did not answer all the questions. Another 27 responses were removed because respondents selected the same answer for all questions (resulting in a zero standard deviation), and a further 8 responses were removed as outliers based on Mahalanobis distances (Appendix section 3). The final number of respondents used for this study was 139.

The normality of distribution for the sample tested, and all variables were normal without any missing, because their skewness was in the range of -1.5 and +1.5, and their kurtosis was in the range of -2.5 and +2.5. (Appendix section 4)

5.3 Demography and Frequency of Sample

All the tables and graphs related to analysis of the demographics and frequency are presented in the Appendix 5; from 139 respondents 52.5% were male, and 47.5% were female. Figure 3 show the frequencies and percentages associated with age, with the majority age group of respondents (43.9%) were between 41 and 49 and closely followed by the age group between 31 to 39 with 41.7% indicating that almost 86% of the project managers were between 31 to 49 age group.

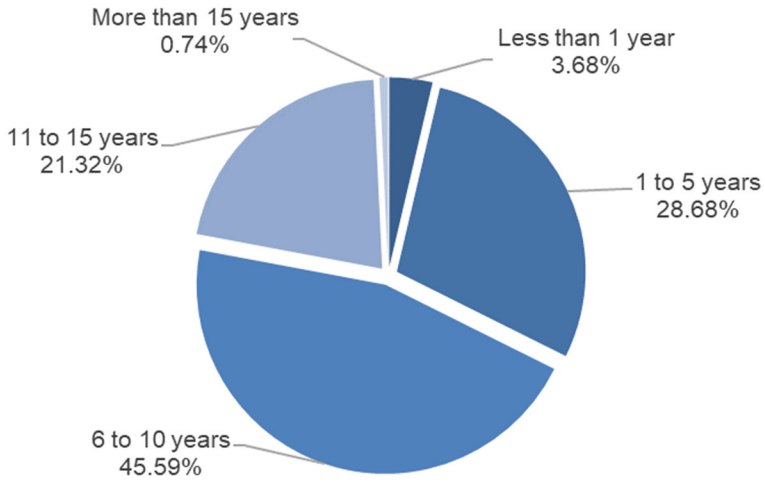
Figure 3 – *Age Distribution*



Source: Own research

Figure 4 displays the percentages associated with years of experience in project management role; the maximum year of experience was more than 15 years and the minimum year of experience was less than one year. The majority of the respondents (45.59%) had 6 to 10 years' experience.

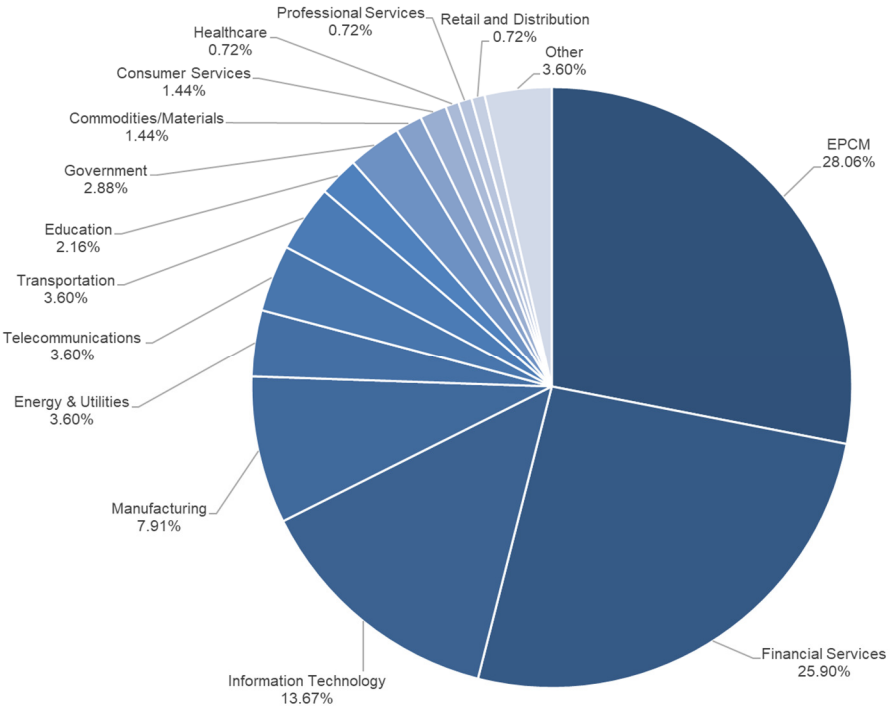
Figure 4 – *Distribution of experience in project management role*



Source: Own research

Work experience of the majority of respondents were within South Africa (34.53%), followed by the United States of America (13.6%); from 139 respondents, 18 respondents worked in multiple countries. Almost 54% of respondents worked in two sectors: 28.1% worked in the EPCM industry and 25.9% in the financial services industry. The percentages associated with each industry are showed in Figure 5.

Figure 5 – *Industry Distribution*



Source: Own research

5.4 Validity/ Principal Component Analysis

The survey asking respondents to indicate their perceptions relating to 20 statements (Seven questions relating to time management, five questions relating to cost management, and eight questions relating to project management satisfaction) on a Five-point Likert scale.

The PCA by IBM SPSS (Version 25) was done to check the validity of those 20 statements as the variable. At the Correlation Matrix (Appendix 6) all variables have at least one correlation above 0.3, and based on table 6 the KMO was equal to 0.75, which is above the minimum acceptance criteria of >0.60. Bartlett's test of sphericity was determined to be $p < 0.001$ at a 95% level of confidence, which implies statistically significant; According to those parameters, validity was approved and PCA was significant.

Table 6

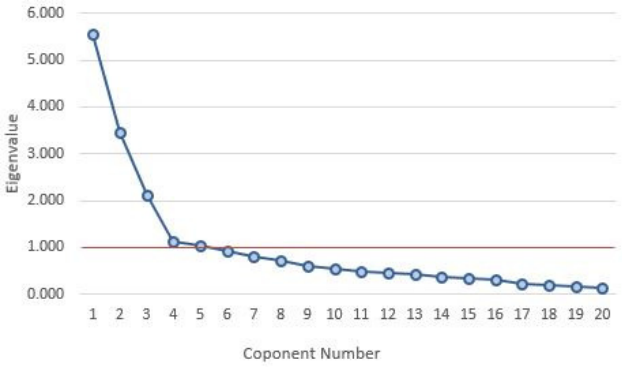
Principal Component Analyses – KMO and Bartlet's test at 95% confidence level

Kaiser-Meyer-Olk in Measure of Sampling Adequacy		**0.750**
Bartlett's Test of Sphericity	Approx. Chi-Square	1359.512
	df	190
	Sig.	0.000

Source: Own research

Table 7 presents the principal component analysis indicating the total variance explained by the different components. The cumulative percentage of variance that can be explained by the first five components is 66.377%, which means that approximately 66% of the common variance shared by 20 variables can be accounted for by the five factors. Based on the Kaiser's rule only components with eigenvalues above 1.0 should be considered meaningful that displayed it in Figure 6.

Figure 6 – *Principal Component Analysis - Scree Plot for Eigenvalue*



Source: Own research

Table 7

Principal Component Analyses - total variance explained by the different components

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	**5.542**	**27.708**	**27.708**
2	**3.461**	**17.303**	**45.011**
3	**2.111**	**10.557**	**55.568**
4	**1.117**	**5.586**	**61.154**
5	**1.045**	**5.223**	**66.377**
6	0.931	4.654	71.031
7	0.798	3.989	75.019
8	0.715	3.573	78.592
9	0.617	3.085	81.677
10	0.557	2.785	84.462
11	0.481	2.407	86.869
12	0.451	2.256	89.126
13	0.425	2.124	91.250
14	0.378	1.891	93.141
15	0.346	1.728	94.869
16	0.318	1.588	96.458
17	0.221	1.103	97.561
18	0.199	0.996	98.558
19	0.159	0.796	99.354
20	0.129	0.646	100.000

Source: Own research

5.5 Exploratory Factor Analysis with Varimax Rotation

PCA identified the five factors, based on the EFA Varimax with Kaiser normalisation was run with five factors, and according to table 8 as Rotated Component Matrix (RCM) the variables grouped at five components. PS6 and T1 loaded on two components and according to their value the researcher decided to put PS6 in component one and T1 in component two. However, because component four and five had only one item each loaded, and a component need minimum three items (Pallant, 2011) the researcher rerun the test and force the analysis to three components. This suggests that a three-factor solution is likely to be more appropriate. Based on it must run the EFA Varimax with Kaiser normalisation again but with three factors.

Table 8

Exploratory Factor Analysis/ Varimax – five factors - rotated component matrix[a]

	Component				
	1	2	3	4	5
PS7	0.834				
PS3	0.817				
PS5	0.816				
PS8	0.813				
PS4	0.793				
PS1	0.588				
T3		0.772			
T2		0.746			
T4		0.716			
T6		0.710			
T5		0.686			
T7		0.683			
C4			0.799		
C5			0.782		
C3			0.695		
C2			0.684		
PS2				0.849	
PS6	**0.507**			0.702	
C1					0.790
T1		**0.538**			0.598

a. Rotation converged in 7 iterations

Source: Own research

According to total variance explained table (Appendix 7) the cumulative percentage of variance that can be explained by the first three components is 55.568%, which means that approximately 56% of the common variance shared by 20 variables can be accounted for by the three factors. Based on table 9, variables grouped at the three components and each component had more than three variables. The RCM was valid because based on

Component Matrix (Appendix 7) each factor was above 0.4, and in each component the average is more than 0.65 (Pallant, 2011).

Based on the KMO and Bartlett's Test (Appendix 7) the KMO was equal to 0.75 that was bigger than the minimum value (0.6), and the p-value of Bartlett's test of sphericity was less than 0.001 at 95% level of confidence that means it was statistically significant; According to all those parameters, validity approved, and EFA was significant.

Table 9

Exploratory Factor Analysis/ Varimax – three factors - rotated component matrix[a]

	Component		
	1	2	3
PS3	0.822		
PS7	0.807		
PS4	0.779		
PS8	0.772		
PS5	0.770		
PS6	0.734		
PS1	0.680		
PS2	0.605		
T3		0.762	
T2		0.760	
T6		0.718	
T7		0.711	
T4		0.698	
T5		0.660	
T1		0.613	
C2			0.759
C4			0.745
C3			0.744
C5			0.701
C1			0.531

a. Rotation converged in 5 iterations.

Source: Own research

5.6 Reliability

According to the valid RCM as result of EFA, the reliability of each component was checked separately. As mentioned in Section 4.9 and 4.12.2, the researcher used the Cronbach's Alpha test, to determine the acceptable range for each component identified, based on the literature reviewed, as to meet the reliability criteria.

5.6.1 Project Management Satisfaction

The first component is included in the eight questions related to the dependent variable - project success (project management satisfaction). Based on Table 10 the Cronbach's Alpha (0.884) was more than the acceptable value (0.70) (Sanchez et al., 2017); so, it met the reliability.

Table 10

Reliability Statistics - project success (PS)

Cronbach's Alpha	N of Items
0.884	8

Source: Own research

According to Table 11 only if the PS2 is removed then the Cronbach's Alpha can improve from 0.884 to 0.887. Because the change is small the researcher decided to maintain the status quo.

Table 11

Item Total Statistics - project success (PS)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PS1	29.14	14.443	0.585	0.875
PS2	29.55	13.698	0.519	**0.887**
PS3	29.17	13.835	0.736	0.862
PS4	29.17	14.052	0.684	0.867
PS5	29.19	13.723	0.686	0.866
PS6	29.57	12.885	0.661	0.870
PS7	29.21	13.717	0.737	0.861
PS8	29.22	13.769	0.689	0.866

Source: Own research

5.6.2 Time Management

The second component is included in the six questions related to the independent variable - time management (as a construct of planning). Based on Table 12 the Cronbach's Alpha (0.842) was more than the acceptable value (0.70) (Grissom et al., 2015); it met the reliability.

Table 12

Reliability Statistics - time management (T)

Cronbach's Alpha	N of Items
0.842	6

Source: Own research

According to related item total statistics table (Appendix 8) the Cronbach's Alpha cannot be improved by removing any of the variables.

5.6.3 Cost Management

The third component is included the five questions related to the independent variable - cost management (as a construct of planning). Based on Table 13 the Cronbach's Alpha (0.774) was more than the acceptable value (0.70) (Smith, 2016); It met the reliability.

Table 13

Reliability Statistics - Cost management (C)

Cronbach's Alpha	N of Items
0.774	5

Source: Own research

According to Table 14 only if the C1 is removed then the Cronbach's Alpha can improve from 0.774 to 0.785. Because the change is small the researcher decided to maintain the status quo.

Table 14

Item Total Statistics - cost management satisfaction (C)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C1	18.00	3.420	0.366	**0.785**
C2	18.06	2.844	0.610	0.709
C3	18.00	3.000	0.580	0.721
C4	18.12	2.581	0.608	0.711
C5	18.04	2.962	0.578	0.721

Source: Own research

5.7 Structural Equation Modelling

5.7.1 Confirmatory Factor Analysis on Measurement Model

The researcher used IBM SPSS AMOS (version 25) software and created the measurement model of SEM (MM0) based on the RCM that passed the validity and reliability during the EFA. The model was further enhanced to improve the model fit. The detail of analysis is showed in Appendix 9.

The researcher ran the model, first the p-value at the table named Regression Weights was checked (Appendix 9) that all of them were less than 0.001 at 95% level of confidence that

means they were statistically significant. Then the main parameters based on Table 4 at the section 4.12.3 was checked; the model did not fit and it was improved by adding correlation of some of the error terms. The CR and AVE (calculated based on formula that mentioned at Appendix 9) was checked with criteria that mentioned at section 4.12.3 after achieving the fitted model (MM3). The model failed because of converting validity.

The researcher improved the failed model based on understanding the outcomes, for example, he removed the variable with the lowest standard regression for the factors that did not pass the validity. Finally, after removing PS2, C1, T7, C5, T4, and T1, achieved the fitted model (MM6) passed validity and reliability. Table 15 showed a summary of models from MM0 to MM6, and Figure 7 is the MM6 as the final standardised measurement model.

One variable (PS2) were removed from Project Success factor, three variables (T7, T4, and T1) were removed from the time management factor, and two variables (C1, and C5) were removed from cost management factor. Covariance added between structural error term (e10 and e13, e3 and e7, e1 and e3), and Covariance existed between some factors (Success and time, Success and cost, Time and cost)

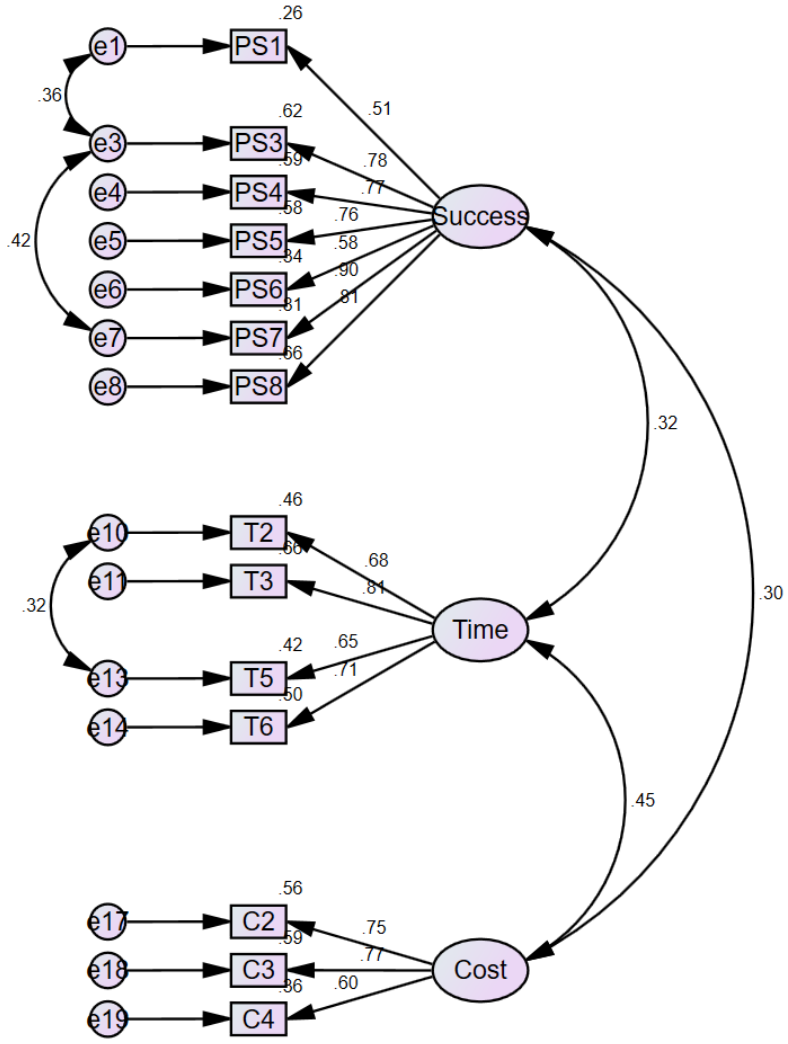
Table 15

SEM - Summary of improvement and finalizing of Measurement Model

			Model						
			MM0	**MM1**	**MM2**	**MM3**	**MM4**	**MM5**	**MM6**
CMIN/DF	**<3.00**		2.472	2.084	1.420	1.266	1.096	1.173	1.263
RMR	**<0.09**		0.036	0.029	0.027	0.025	0.023	0.024	0.025
AGFI	**>0.80**		0.745	0.769	0.829	0.844	0.871	0.876	0.881
TLI	**>0.95**		0.776	0.835	0.936	0.959	0.986	0.978	0.972
CFI	**>0.95**		0.803	0.856	0.947	0.968	0.989	0.982	0.978
RMSEA	**<0.05**		0.103	0.089	0.055	0.044	0.026	0.035	0.044
PCLOSE	**>0.05**		0.000	0.000	0.295	0.693	0.939	0.818	0.630
HOELTER 0.05	**>130**		67	79	116	131	154	148	142
Composite Reliability (CR)	**> 0.7**	**Success**	N/A	N/A	N/A	0.883	0.812	0.811	0.806
		Time	N/A	N/A	N/A	0.812	0.893	0.893	0.893
		Cost	N/A	N/A	N/A	0.757	0.760	0.750	0.750
Convergent Validity (AVE)	**> 0.5**	**Success**	N/A	N/A	N/A	0.499	0.550	0.551	0.511
		Time	N/A	N/A	N/A	0.392	0.391	0.424	0.550
		Cost	N/A	N/A	N/A	0.395	0.447	0.503	0.502
		Action need	Analysis	Improve	Improve	Improve	Improve	Improve	Improve
Action		**Added covariance between structural error term at**	-----	MM0	MM1	MM2	N/A	N/A	N/A
		Removed variable	N/A	N/A	N/A	N/A	MM3	MM4	MM5
		Status after action	Was not fitted	Was not fitted	Was not fitted	It was fitted but was not valid	It was fitted but was not valid	It was fitted but was not valid	It was fitted and valid

Source: Own research

Figure 7 – *Structural Equation Modelling - final standardized measurement model (MM6)*



Source: Own research

5.7.2 Confirmatory Factor Analysis on Structural Model

According to final standardised measurement model that identified final suitable factors and variables, the researcher created the first SEM structural model (MS0) based on a conceptual model and hypothesis that was identified in chapter three. This was followed by an improvement of the model similar to the process that was used during the measurement model optimisation to achieve a final fitted standardised structural model that passed validity and reliability. The detail of analysis is showed in Appendix 10.

Table 16 showed a summary of model fit analysis from MS0 to MS1 that the researcher improved the model.

Table 16

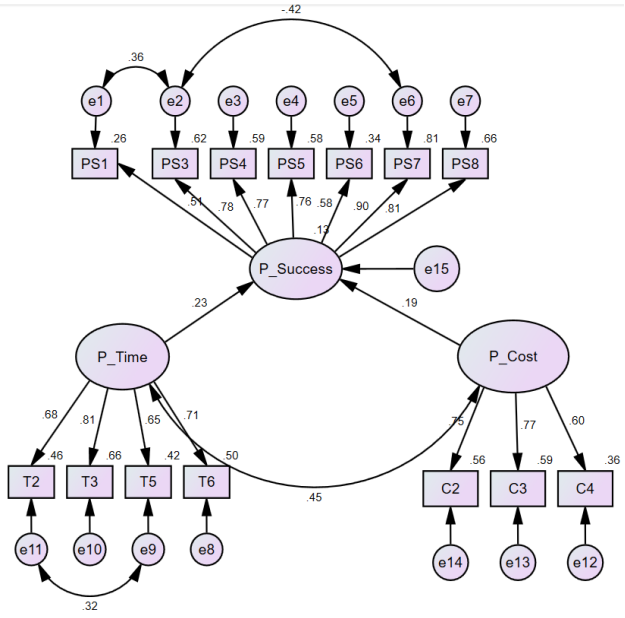
SEM - Summary of improvement and finalizing of Structural Model

			Model	
			SM0	**SM1**
CMIN/DF	**<3.00**		1.747	1.263
RMR	**<0.09**		0.026	0.025
AGFI	**>0.80**		0.842	0.881
TLI	**>0.95**		0.919	0.972
CFI	**>0.95**		0.934	0.978
RMSEA	**<0.05**		0.074	0.044
PCLOSE	**>0.05**		0.038	0.630
HOELTER 0.05	**>130**		102	142.000
		Action need	Analysis	Improve
	Action	**Added covariance between structural error term at**	-----	SM0
		Removed variable	N/A	N/A
		Status after action	Was not fitted	It was fitted and valid

Source: Own research

Figure 8 is the MS1 as the final standardised structural model specified with factors and variables aligned with the conceptual model and hypothesis. The factors and variable were the same as measurement model with an improvement in the model. The covariance was added between structural error terms (e1 and e2, e2 and e6, e9 and e11). Finally, four variables were kept from the original six variables under the time factor (T1 and T4 removed), three variables kept from five variables under the cost factor (C1 and C5 removed), and seven variables from eight variables were kept under the success factor (SP2 removed) to allow the model to meet both validity and reliability criteria's.

Figure 8 – *Structural Equation Modelling - final standardized structural model (SM1)*



Source: Own research

5.8 Statistical test

5.8.1 Pearson Correlation (two-tailed)

Correlation analysis was used to explain the power and direction of the linear relationship between two variables. Based on Table 17, no missing data existed (n=139), and because all the p-values were less than 0.001 at 95% level of confidence, then all were statistically significant.

All the direction of relationships was positive based on the Pearson correlation. As mentioned by (Pallant, 2011), a quite strong relationship existed between time and cost as two independent variables (r= 0.539), and the relationship between independent variables and dependent variable (Success) was medium (r= 0.346 for cost and r = 0.361 for time against success).

Table 17

Correlations between variables

		Success	Cost	Time
Success	Pearson Correlation	1	0.346**	0.361**
	Sig. (2-tailed)		0.000	0.000
	N	139	139	139
Cost	Pearson Correlation	0.346**	1	0.539**
	Sig. (2-tailed)	0.000		0.000
	N	139	139	139
Time	Pearson Correlation	0.361**	0.539**	1
	Sig. (2-tailed)	0.000	0.000	
	N	139	139	139

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Own research

5.8.1.1 Hypothesis 1 (Time and Project Management Satisfaction)

The Pearson correlation coefficient (+0.361) indicated a positive correlation between time management and success (project management satisfaction). With more attention to time management by the project management, they have more satisfaction with project success

5.8.1.2 Hypothesis 2 (Cost and Project Management Satisfaction)

The Pearson correlation coefficient (+0.346) indicated a positive correlation between cost management and success (project management satisfaction). With more attention to cost management by the project management, they have more satisfaction with project success.

5.8.1.3 Hypothesis 3 (Planning and Success)

At this research, the time management and cost management were the constructs of planning and management satisfaction was the construct for project success. The positive relationship between them was indicative of a positive correlation between planning and project success. With more attention to planning by the project management, they have more satisfaction with project success.

5.8.2 Standard Multiple Regression

As mentioned at section 4.12.4, before did the multiple regression analyses, were checked all assumptions for regression analyses and all met.

5.8.2.1 Hypothesis 1 (Time and Project Management Satisfaction)

Based on the descriptive statistics table (Appendix 11) no data was missed (n=139), and based on 5.8.1, time management (independent variable) and project management satisfaction (dependent variable) have a positive relationship. R Square (0.130) at table 18, indicated that the cost management predicted approximately 13% of the variance in project management satisfaction. Based on Table 18 and 19, the p-value of f-test at 95% level of confidence was less than $p < 0.001$ that means model was statistically significant and it was a good fit. Also, the Durbin-Watson (1.705) was between 1.5 and 2.5, implying that no auto-correlation existed.

Table 18

Model Summary[b] - Correlations between Time management and Project management satisfaction

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.361[a]	0.130	0.124	0.5292781	**0.130**	20.501	1	137	**0.000**	**1.705**

a. Predictors: (Constant), Cost

b. Dependent Variable: Success

Source: Own research

Table 19

ANOVA[a] - Correlations between Time and Project management satisfaction

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.743	1	5.743	20.501	.000b
	Residual	38.379	137	0.280		
	Total	44.122	138			

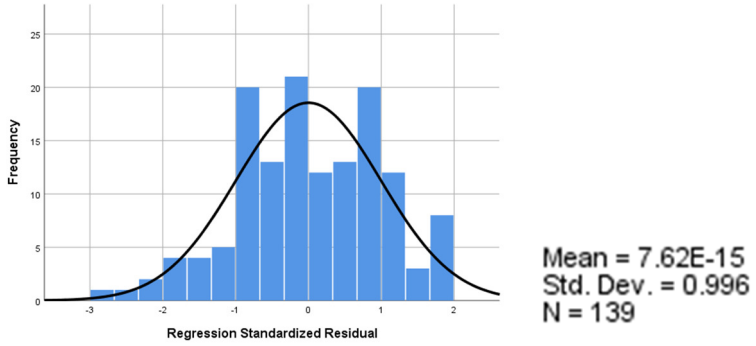
a. Dependent Variable: Success

b. Predictors: (Constant), Time

Source: Own research

According to figure 9, the mean was closed to zero for a standardised residual distribution, which implies that means it distributed normally.

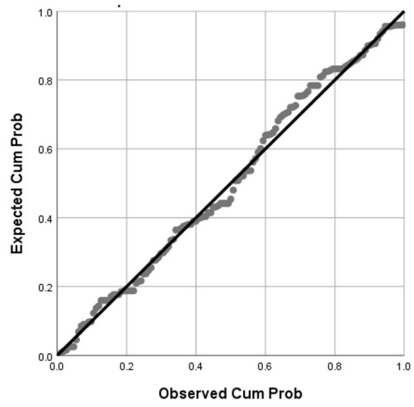
Figure 9 - *Standard multiple regression - Histogram - Time management and Project management satisfaction*



Source: Own research

Based on the figure 10, data were followed and the central line that indicated the little deviation of the expected values from the observed values.

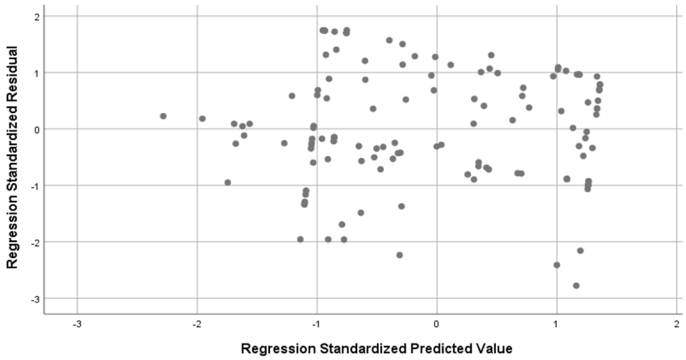
Figure 10 - *Standard multiple regression – Normal P-P Plot - Time management and Project management satisfaction*



Source: Own research

According to figure 11, there is no pattern in the scatter, it means that the width of the scatter as predicted values increased was roughly the same, so the assumption had been met.

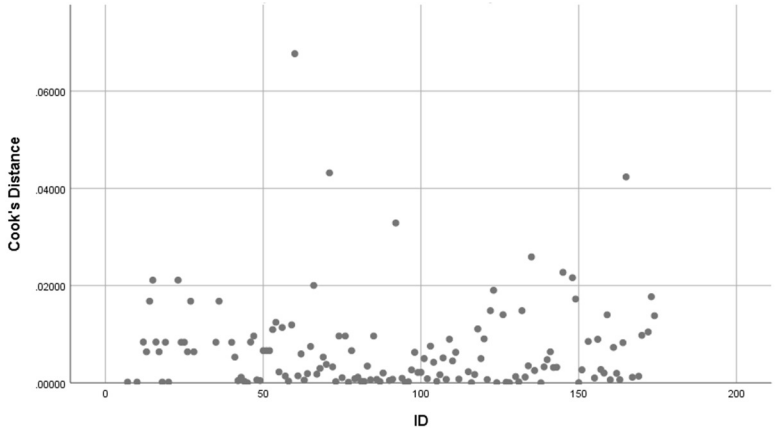
Figure 11 - *Standard multiple regression – Scatterplot - Time management and Project management satisfaction*



Source: Own research

At the figure 12, because all ID's were less than one (Cook's distance) and no case had an undue influence on the overall model.

Figure 12 - *Standard multiple regression – Cook's Distance – Time management and Project management satisfaction*



Source: Own research

5.8.2.2 Hypothesis 2 (Cost and Project Management Satisfaction)

Based on the descriptive statistics table (Appendix 11) no data was missed (n=139), and based on 5.8.2, cost management (independent variable) and Project management satisfaction (dependent variable) have a positive relationship. R Square (0.120) at table 20, indicate that the cost management predicted approximately 12% of the variance in project management satisfaction. Based on Table 20 and 21, the p-value of f-test at 95% level of

confidence was less than p < 0.001 that means model was statistically significant and it was a good fit. Also, the Durbin-Watson (1.615) was between 1.5 and 2.5, implying that no auto-correlation existed.

Table 20

Model Summary[b] - Correlations between Cost management and Project management satisfaction

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	**0.346[a]**	0.120	0.113	0.5325066	0.120	18.597	1	137	**0.000**	**1.615**

a. Predictors: (Constant), Cost

b. Dependent Variable: Success

Source: Own research

Table 21

ANOVA[a] - Correlations between Cost and Project management satisfaction

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.273	1	5.273	18.597	.000[b]
	Residual	38.848	137	0.284		
	Total	44.122	138			

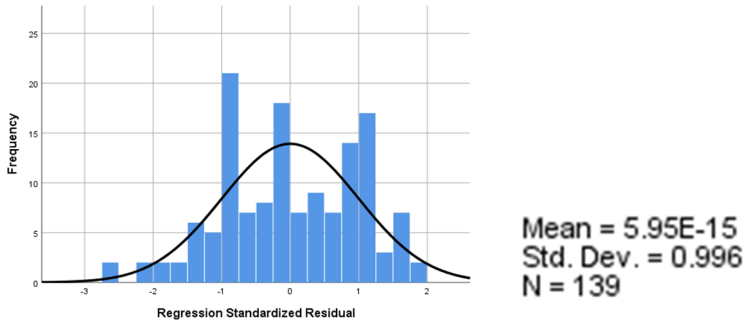
a. Dependent Variable: Success

b. Predictors: (Constant), Time

Source: Own research

According to figure 13, the mean was closed to zero for a standardised residual distribution, which implies that means it distributed normally.

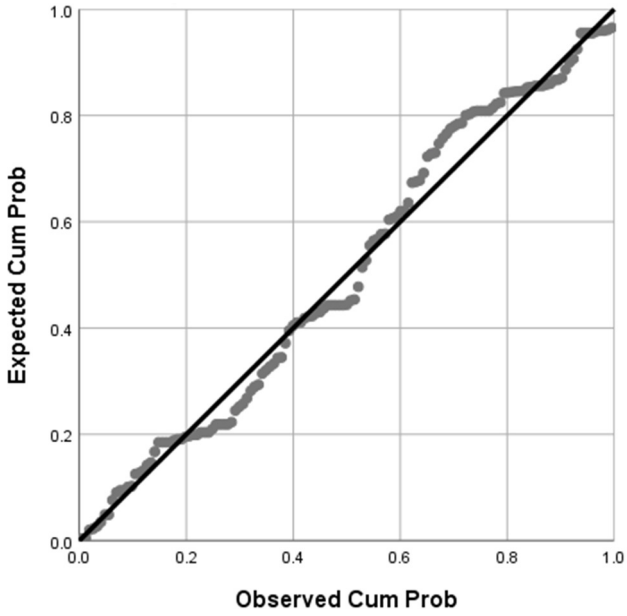
Figure 13 - *Standard multiple regression - Histogram – Cost management and Project management satisfaction*



Source: Own research

Based on the figure 14, data were followed and the central line that indicated the little deviation of the expected values from the observed values.

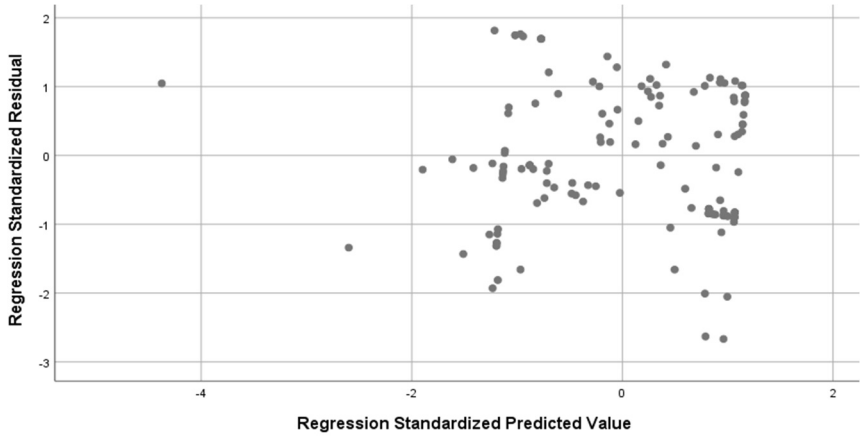
Figure 14 - *Standard multiple regression – Normal P-P Plot - Cost management and Project management satisfaction*



Source: Own research

According to figure 15, there is no pattern in the scatter, it means that the width of the scatter as predicted values increased was roughly the same, so the assumption had been met.

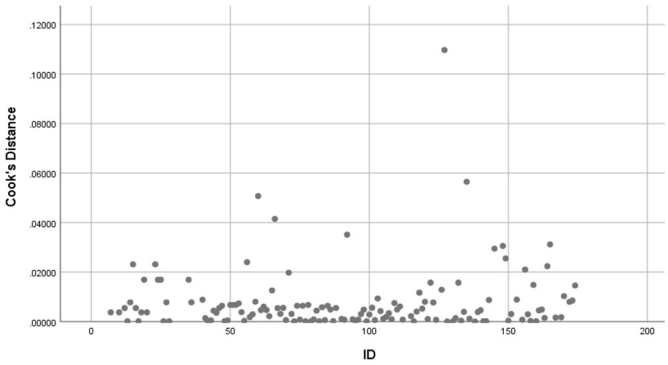
Figure 15 - *Standard multiple regression – Scatterplot – Cost management and Project management satisfaction*



Source: Own research

At the figure 16, because all ID's were less than one (Cook's distance) and no case had an undue influence on the overall model

Figure 16 - *Standard multiple regression – Cook's Distance - Cost management and Project management satisfaction*



Source: Own research

5.8.2.3 Hypothesis 3 (Planning and Success)

Time management and cost management was the construct for planning and project management satisfaction was the Project Success construct. The researcher reviewed the relationship of time and cost management together with project management satisfaction, it means that, the researcher reviewed the relation between planning and project success.

Based on the descriptive statistics table (Appendix 11) no data was missed (n=139), and based on 5.8.3, time and cost management (independent variables) and project management satisfaction (dependent variable) have a positive relationship. R Square (0.162) at table 22, indicated that the planning predicted approximately 16.2% of the variance in project management satisfaction. Based on Table 22 and 23, the p-value of f-test at 95% level of confidence was less than $p < 0.001$ that means model was statistically significant and it was a good fit. Also, the Durbin-Watson (1.663) was between 1.5 and 2.5, implying that no auto-correlation existed.

Table 22

Model Summary[b] - Correlations between time and cost management and Project management satisfaction

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	**.403[a]**	0.162	0.150	0.5212859	0.162	13.184	2	136	**0.000**	**1.663**

a. Predictors: (Constant), Cost, Time

b. Dependent Variable: Success

Source: Own research

Table 23

ANOVA[a] - Correlations between Time and Cost management and Project management satisfaction

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.165	2	3.583	13.184	.000[b]
	Residual	36.956	136	0.272		
	Total	44.122	138			

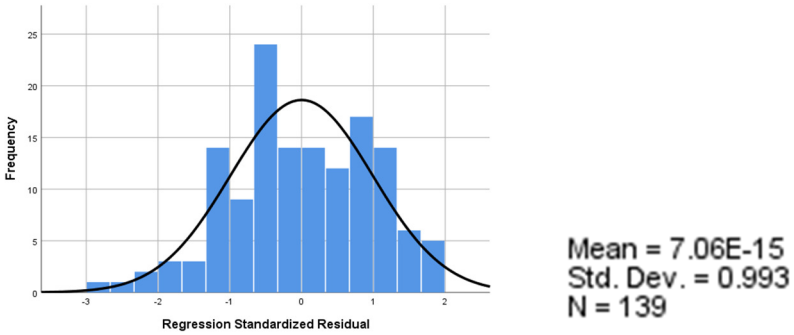
a. Dependent Variable: Success

b. Predictors: (Constant), Cost, Time

Source: Own research

According to figure 17, the mean was closed to zero for a standardised residual distribution, which implies that means it distributed normally

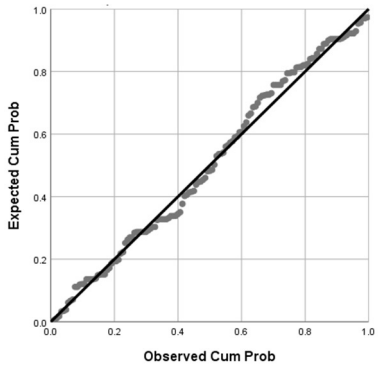
Figure 17- *Standard multiple regression - Histogram – Time and cost management and Project management satisfaction*



Source: Own research

Based on the figure 18, data were followed and the central line that indicated the little deviation of the expected values from the observed values.

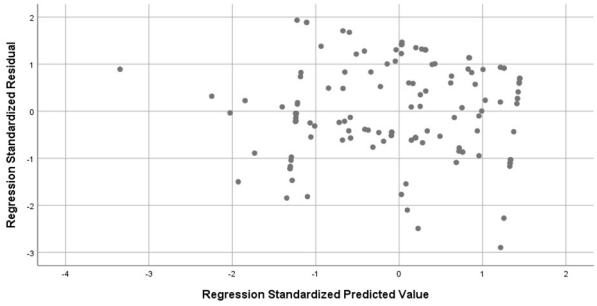
Figure 18 - *Standard multiple regression – Normal P-P Plot – Time and cost management and Project management satisfaction*



Source: Own research

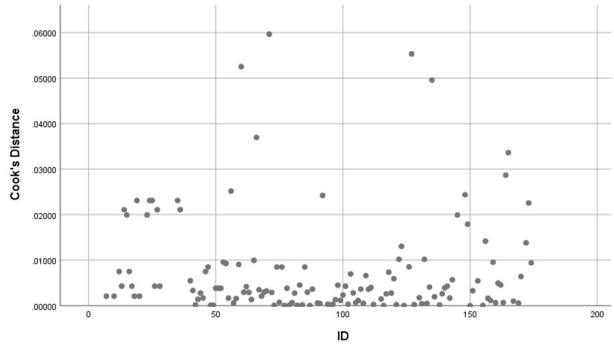
According to figure 19, there is no pattern in the scatter, it means that the width of the scatter as predicted values increased was roughly the same, so the assumption had been met.

Figure 19 - *Standard multiple regression – Scatterplot – Time and cost management and Project management satisfaction*



At the figure 20, because all ID's were less than one (Cook's distance) and no case had an undue influence on the overall model.

Figure 20 - *Standard multiple regression – Cook's Distance – Time and cost management and Project management satisfaction*



Source: Own research

5.8.3 Hypotheses

5.8.3.1 Hypothesis 1

The null hypothesis was "There is no statistically significant positive relationship between time management and satisfaction of project manager (as project success) ($H1_0$)." and the alternative hypothesis was "There is a statistically significant positive relationship between time management and satisfaction of project manager (as project success) ($H1_A$)".

Based on results in section 5.8.1.1, a positive relationship existed between time management and project success (satisfaction of the project manager). Also, according to result in section 5.8.2.1, the time management predicted approximately 13% of the variance

in satisfaction of project manager (F = 20.501, p <0.001 at 95% level of confidence). And according to table 24, the regression coefficient of time management was statistically significant at 95% level of confidence (Beta = 0.519, p < 0.001).

Table 24

Coefficients[a] – Time management and Satisfaction of project manager

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	**2.235**	0.482		4.636	0.000	1.282	3.189		
	Time	**0.519**	0.115	0.361	4.528	0.000	0.292	0.746	1.000	**1.000**

a. Dependent Variable: Success

Source: Own research

The null hypothesis rejected and the alternative hypothesis accepted at the 95% confidence level.

Equation 1 – *Relationship between time management and project management satisfaction*

$$Satisfaction\ of\ project\ manager\ = 2.235 + (0.519 \times Time\ Management)$$

5.8.3.2 Hypothesis 2

The null hypothesis was "There is no statistically significant positive relationship between cost management and satisfaction of project manager (as project success) ($H2_0$)." and the alternative hypothesis was “There is a statistically significant positive relationship between cost management and satisfaction of project manager (as project success) ($H2_A$)”.

Based on results in section 5.8.1.2, a positive relationship existed between cost management and project success (satisfaction of the project manager). Also, according to result in section 5.8.2.2, the cost management predicted approximately 12% of the variance in satisfaction of project manager (F = 18.597, p <0.001 at 95% confidence level). And according to Table 25, the regression coefficient of cost management was statistically significant at 95% confidence level (Beta = 0.510, p < 0.001).

Table 25

Coefficients[a] – Cost management and Satisfaction of project manager

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	**2.391**	0.470		5.086	0.000	1.462	3.321		
	Cost	**0.510**	0.118	0.346	4.312	0.000	0.276	0.744	1.000	**1.000**

a. Dependent Variable: Success

Source: Own research

The null hypothesis rejected and the alternative hypothesis accepted at the 95% confidence level.

Equation 2 – *Relationship between cost management and project management satisfaction*

$$Satisfaction\ of\ project\ manager\ = 2.391 + (0.510 \times Time\ Management)$$

5.8.3.3 Hypothesis 3

The null hypothesis was "There is no positive statistical relationship between Planning and success of project. ($H3_0$). And the alternative hypothesis was “There is a positive statistical relationship between Planning and success of project. ($H3_A$)”.

As mentioned earlier, time management and cost management was the construct for planning and project management satisfaction was construct for the project Success. Researcher reviewed the relationship of time and cost management together with project management satisfaction, it means researcher reviewed the relation between planning and project success.

Based on results in section 5.8.1.3, a positive relationship existed between planning (time and cost management) and Project success (satisfaction of the project manager). Also, according to result in section 5.8.2.3, the time management predicted approximately 16% of the variance in project success ($F = 13.184$, $p < 0.001$ at 95% confidence level). And according to Table 26, the regression coefficient of time management was statistically significant at 95% confidence level (Beta = 0.354, $p < 0.001$) and the regression coefficient of cost management was statistically significant at 95% confidence level (Beta = 0.314, $p < 0.01$). As mentioned at section 4.12.4 because VIF (1.410) was less ten then indicated the model was a good fit.

Table 26

Coefficients[a] – Planning (time and cost management) and Project Success (project management satisfaction)

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.684	0.533		3.161	0.002	0.630	2.737		
	Time	0.354	0.134	0.246	2.638	0.009	0.089	0.619	0.709	**1.410**
	Cost	0.314	0.137	0.213	2.288	0.024	0.043	0.586	0.709	**1.410**

a. Dependent Variable: Success

Source: Own research

The null hypothesis rejected and the alternative hypothesis accepted at the 95% confidence level.

Equation 3 - *Relationship between Time and cost management (Planning) and Project success (project management satisfaction)*

$$Project\ Success\ = 1.684 + (0.453 \times Time\ Management) + (0.314 \times Cost\ Management)$$

Type I and Type II errors were avoided at all multi-regression, because for this research with to independent variables need the sample size must be minimum 67 and at this research was 139 that means the sample size was enough for the current analyses (Pallant, 2011).

5.9 Conclusion

Data analysis done according to gather data from a survey that related to three hypotheses. The result displayed the normalisation distribution, acceptable level of reliability, and validity of the data. The positive correlation existed between independent and dependent variables. All assumption that required for the multi-regression was passed; Regression did base on the fitted model then all the nulls hypothesises were rejected. At the next chapter discussion on the results was done based on the literature reviewed (Chapter two).

Chapter 6: Discussion of Results

6.1 Introduction

In this chapter, the result of the study that were presented at chapter five are discussed, and are compared with the literature reviewed that presented at chapter two. The purpose of this research was specified in the relation between planning and project success that based on hypothesis used time management and cost management as a construct of planning (independent variables) and project management satisfaction as a construct of project success (dependent variables).

The primary objectives of this study were to predict (with reasonable accuracy)

- relationship that exists between time management and project management satisfaction
- relationship that exists between cost management and project management satisfaction
- relationship that exists between planning and project success

6.2 Overview of Dataset

190 responses received from 220 distributed survey and 139 responses of them were usable, it means the rate of usable response was 63.2%. Based on (Kline, 2011) for research with two independent variables and one dependent variable, the minimum sample size required was 90 that means the sample size of this research is suitable for analysis and generalisation of the result. The demographic variables (same as age, experience, and industry) were not used in the analysis but, they can help the future researchers that want to use this research.

From 139 respondents that their responses were usable, 52.5% was male, and 47.5% was female; The age of majority of respondents (43.9%) were between 41 and 49 years, and after that the highest group was the age between 31 to 39 with 41.7%; almost 86% of the age of project managers as respondents of this study was between 31 to 49 that the majority of them (45.59%) has 6 to 10 years' experience; and the majority of them worked in South Africa (34.53%) and in two categories of industry: EPCM (28.1%) and financial services (25.9%).

6.3 Overview of Constructs

In this research the time management and cost management as independent variables were the construct for planning and project management satisfaction was the construct of project success.

6.3.1 Time Management

Time management was reviewed and assessed as the first independent variables. In section 5.4, Principal Component Analysis confirmed that the scale had adequate construct validity; then, based on Exploratory Factor Analysis at section 5.5 all seven variables related to the time management stayed under one factor. Factors and components in this research were compatible with the other countries (Badewi, 2016; Grissom et al., 2015), this addressed the concern of validity when using an instrument developed in western countries for non-western countries (Korb, 2012).

According to section 5.6.2, the Cronbach alpha was 0.842 indicating reliability with an acceptable level of internal consistency because it is more than 0.79 scores (Grissom et al., 2015) and lower than 0.85 (Pehlivan, 2013). According to fitted, validated, and reliable Measurement Model that achieved based on Confirmatory Factor Analysis at section 5.7.1, tree items (T1, T4 and T7) out of seven items under this factor were removed. Then, the final Structural Model was used that showed in section 5.7.2 for statistical tests (correlation and multiple regression).

Based on information at section 9.4, the mean score for time management was 4.46, indicating a high perceived level of time management; it is near the 4.32 (Grissom et al., 2015) at five-point Likert scale. Based on section 9.3 data distributed normally. It means that, the answers of responded distributed near the central line (4.46) at both sides; in another word it can be said that the majority of respondents were selected the "agree" option to answer the questions about the time management and it was compatible with the result of other researches (Bjarnason, 2015; Grissom et al., 2015; Paramati et al., 2017; Sligo et al., 2017). They mentioned, the project managers believed the time management had a positive effect on the status of the project in different point of view same as progress, closeout and success.

6.3.2 Cost Management

Cost management was reviewed and assessed as the second independent variables. In section 5.4, Principal Component Analysis confirmed that the scale had adequate construct validity; then based on Exploratory Factor Analysis at section 5.5 all five questions/ variables related to the time management stayed under one factor. Factors and components in this research were compatible with the other countries (Badewi, 2016; Smith, 2014, 2016), this addressed the concern of validity when using an instrument developed in western countries for non-western countries (Korb, 2012).

According to section 5.6.3, the Cronbach alpha was 0.774 indicating reliability with an acceptable level of internal consistency because it is more than 0.77 scores (Chen, 2015) and lower than 0.82 (M. Anderson et al., 2013). According to fitted, validated, and reliable Measurement Model that achieved based on Confirmatory Factor Analysis at section 5.7.1, two items (C1 and C5) out of five items under this factor were removed. Then, the final Structural Model showed at section 5.7.2 for statistical tests (correlation and multiple regression).

Based on other researches, the project managers can control status of the project with monitoring the expenses (M. Anderson et al., 2013; Khodakarami & Abdi, 2014) and majority of project managers believed they need cost management to finish the projects without extra budget (A. Martens & Vanhoucke, 2017; Smith, 2014, 2016). Dataset of this research also shows the same, because according to information at section 9.4, the mean score for cost management was 4.51 that indicating a high perceived level of cost management and it was near the 4.37 (Smith, 2016) five-point Likert scale. Data distributed normally based on section 9.3 it means that, the responded answers distributed near the central line (4.51) at both sides; in another word, it can be said that the majority of respondents were selected the "agree" option to answer the questions about the cost management same as finding of other researches as mentioned previously.

6.3.3 Project Management Satisfaction

Project management satisfaction was reviewed and assessed as the dependent variables. In section 5.4, Principal Component Analysis confirmed that the scale had adequate construct validity; Then, based on Exploratory Factor Analysis at section 5.5, all eight variables related to the project management satisfaction stayed under one factor. Factors and components in this research were compatible with the other countries (Badewi, 2016;

Fonseca et al., 2016; Sanchez et al., 2017). This addressed the concern of validity when using an instrument developed in western countries for non-western countries (Korb, 2012).

According to section 5.6.1, the Cronbach alpha was 0.842 indicating reliability with an acceptable level of internal consistency because it is more than 0.72 scores (Sanchez et al., 2017). According to fitted, validated, and reliable Measurement Model that achieved based on Confirmatory Factor Analysis at section 5.7.1, one items (SP2) out of eight items under this factor removed then the final Structural Model was showed in section 5.7.2, for statistical tests (correlation and multiple regression).

Project managers satisfied when they achieved their goals (Williams et al., 2015) but it is not the only way for satisfaction, some researches showed not only achieving the goals are important but also, project managers were satisfied too when they used the correct tools that showed them real status of project. Then, they could manage project based on it and the scores that reported were 3.8 (Fonseca et al., 2016) and 4.1 (Sanchez et al., 2017) at five-point Likert scale in that research. According to information in section 9.4, the mean score for project management satisfaction was 4.18 indicating high perceived level of project management satisfaction. Based on section 9.3, data distributed normally. It means that, the answers of responded distributed near the central line (4.18) at both sides; in another word can say the majority of respondents at this research were selected the "agree and completely agree" options to answer the questions about project management satisfaction that it matched with finding of other researches (Fonseca et al., 2016; Sanchez et al., 2017).

6.4 Hypothesises

6.4.1 Hypothesis 1

The null hypothesis was "There is no statistically significant positive relationship between time management and project management satisfaction (as project success) ($H1_0$)." and the alternative hypothesis was “There is a statistically significant positive relationship between time management and project management satisfaction (as project success) ($H1_A$)”.

According to section 5.8.1.1, the Pearson correlation coefficient (+0.361) indicated a positive correlation between time management and project management satisfaction (as construct of project success). Then, based on section 5.8.2.1, the time management predicted approximately 13% of the variance in project management satisfaction (F =

20.501, p <0.05 at 95% confidence level). As mentioned in the section 5.8.3.1, the regression coefficient was statistically significant at 95% confidence level (Beta = 0.519, p < 0.05) and VIF (1.000) was less than ten indicating that the model was a good fit. The equation showed at section 5.8.3.1.

According to it, the null hypothesis rejected and the alternative hypothesis accepted at the 95% confidence level. It means that statistically significant positive relationship existed between time management and project management satisfaction (as a success of the project). The results of this research is in consistency with the outcomes of other studies (Grissom et al., 2015).

As mentioned the time management predicted nearly 13% of the outcome, which means that the majority of the predictive of project management satisfaction was explained by different independent variables. Based on other literatures in project management (Papke-Shields & Boyer-Wright, 2017; Pehlivan, 2013), the different predictors of project management satisfaction are interrelated, for example quality management, cost management, and risk management.

6.4.2 Hypothesis 2

The null hypothesis was "There is n statistically significant positive relationship between cost management and project management satisfaction (as project success) (H20)." and the alternative hypothesis was “There is a statistically significant positive relationship between cost management and project management satisfaction (as project success) (H2A)”.

According to section 5.8.1.2, the Pearson correlation coefficient (+0.346) indicated a positive correlation between cost management and project management satisfaction (as construct of project success). Then, based on section 5.8.2.2, the time management predicted approximately 12% of the variance in project management satisfaction (F = 18.597, p <0.05 at 95% confidence level). As mentioned in the section 5.8.3.2, the regression coefficient was statistically significant at 95% confidence level (Beta = 0.510, p < 0.05) and VIF (1.000) was less than ten indicating that, the model was a good fit. The equation showed at section 5.8.3.2.

According to it, the null hypothesis rejected and the alternative hypothesis accepted at the 95% confidence level. It means that statistically significant positive relationship existed between cost management and project management satisfaction (as a success of the

project) The results of this research is in consistency with the outcomes of other studies (Chen, 2015; Smith, 2014)

As mentioned, the time management predicted nearly 12% of the outcome, which means that the majority of the predictive of project management satisfaction was explained by different independent variables. Based on other literatures in project management (Khodakarami & Abdi, 2014; Smith, 2014, 2016) the different predictors of project management satisfaction are interrelated, for example, knowledge management, innovation management, strategy management, time management, risk management, and quality management.

6.4.3 Hypothesis 3

The null hypothesis was "There is no positive statistical relationship between Planning and success of project. ($H3_0$). and the alternative hypothesis was “There is a positive statistical relationship between planning and success of project. ($H3_A$)”.

At this research, the time management and cost management were the constructs of planning and project management satisfaction was the construct for project success. According to section 5.8.1, the positive relationship between them was indicating a positive correlation between planning and project success. With more attention to planning by the project management, they have more satisfaction with project success.

Then, based on section 5.8.2.3, the planning predicted approximately 16.2% of the variance in project management satisfaction ($F = 13.184$, $p < 0.05$ at 95% confidence level). As mentioned in the section 5.8.3.3, the regression coefficient was statistically significant at 95% confidence level (Beta = 0.354, $p < 0.05$) and VIF (1.410) was less than ten indicating the model was a good fit.

According to it, the null hypothesis rejected and the alternative hypothesis accepted at the 95% confidence level. It means that, statistically significant positive relationship existed between time management and project management satisfaction (as a success of the project) that result of this research is consisting with the outcomes of other studies (Sanchez et al., 2017).

Based on the literature reviewed at chapter two, the satisfaction of stockholders is equal to project success (Fonseca et al., 2016; Harrison & Wicks, 2013; Heravi et al., 2015; Schnackenberg & Tomlinson, 2016), and based on the stockholder theory the project management is one of the stockholders of the project (Freeman, 1994, 2004; Miles, 2017);

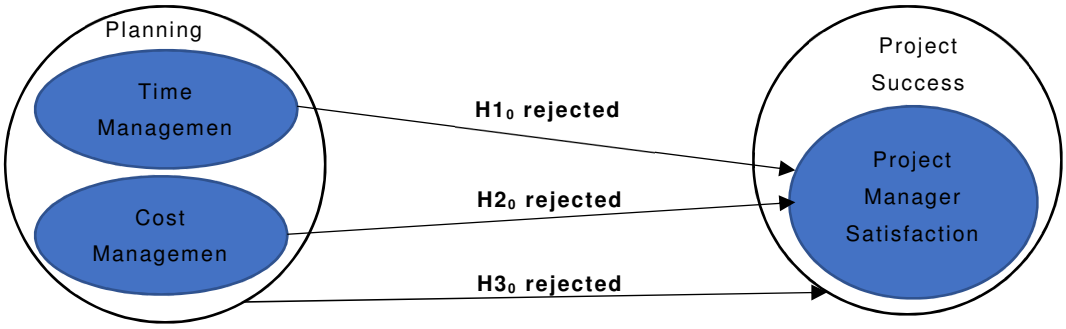
therefore, the project management satisfaction is a construct of project success. Then based on literature reviewed, project management success is equal with project management satisfaction (Ofori, 2013; Radujkovic & Sjekavica, 2017); and according to project success framework (Todorovic et al., 2015), the success of project management is related to the tools, the same as the time management and cost management, that based on the literature reviewed, they are the constructs of planning.

The equation 3 at section 5.8.3.3 presented the time management as construct of planning has a more effectiveness on project success in compare with cost management, but both have the positive relation with project management satisfaction as construct of project success. This consisted of the outcomes of existed researches.

6.5 Conclusion

Based on the results of this study, all the three null hypothesis were rejected, and that a positive relationship existed between independent variables and dependent variable. Figure 20 shows a relationship between variables at the conceptual model.

Figure 21 – *Conceptual model*



Source: Own research

The next chapter includes the theoretical contribution, implications for management, limitations of the study and recommendations for future research.

Chapter 7: Conclusion

7.1 Introduction

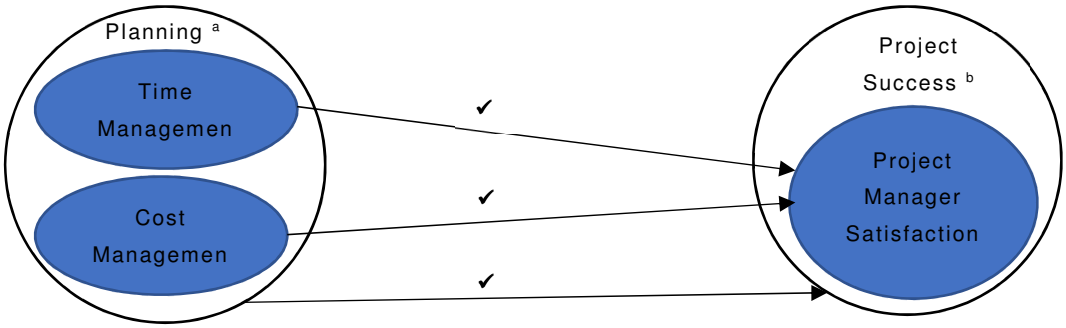
This chapter will be devoted to the individual role of each construct within the project context, as well as the relationship between the constructs and project success. The empirical value of the research and limitations of the study will be highlighted. In addition, the implications for management in terms of the different levels of project management will be discussed.; Finally recommendations in general will be proposed.

7.2 Findings

The purpose of this research was to explore the relationship between project planning and project success, in another word, effectiveness of planning towards project success This study reviewed the relationship between time and cost management as constructs of planning with project management satisfaction as a construct of project success that contribute to the literature.

The conceptual model (Figure 22) was designed based on the reviewed literature, hypotheses explored from it, and the evaluated based on gathered data from the quantitative survey, with the statistical method.

Figure 22 – *Status of Conceptual model according to analysed data*



a: Independent variable

b: Dependent variable

Source: Own research

7.2.1 Hypothesis 1

The results of the study point towards a positive relationship between time management and project management satisfaction.

The development of technology and science also resulted in an increase in the significance of value of time (Grissom et al., 2015). According to the definition of a project, it is imperative for a project to be completed within a specific timeline (Bannerman, 2008; Fu et al., 2016). An increase in this timeline has a negative impact on project success in conjunction with a decrease tin stakeholder satisfaction. A decrease in customer satisfaction is related to increased project cost and risk (Sanchez et al., 2017). Based on the project success framework (Bannerman, 2008), time management is one of the main contributors towards project management success. Empirical research shows that project management satisfaction is equal to project management success, and according to the stakeholder theory project management is one of the stakeholders of a project (Freeman, 1994, 2004; Miles, 2017). In another word, the project is successful if the project management as stockholder is satisfied (Fonseca et al., 2016; Williams et al., 2015).

This study found that there was a statistically significant relationship between the time management and project management satisfaction; That with increasing using the time management to control the project, the project management satisfaction as a construct of project success is increasing too

7.2.2 Hypothesis 2

The results of the research indicate a positive relationship between cost management and project management satisfaction.

A project is deemed successful if the objectives are achieved within the projected budget without additional cost (Colin & Vanhoucke, 2014; Joslin & Müller, 2016); Smith (2014) argue that cost management is the controlling of the project to ensure that project complete at the approved budget. Sanchez, Terlizzi, and De Moraes (2017) agree with this opinion, and state that the completion of a project within an approved budget without added cost is associated with increased stakeholder satisfaction. Based on the project success framework the cost management is one of the main tools for project management success. In researches mentioned project management satisfaction is equal to project management success, and according to the stockholder theory project management is one of the stockholders of a project (Bannerman, 2008; Freeman, 1994, 2004; Miles, 2017). Hence,

the project is successful if the project management as a stockholder is satisfied (Fonseca et al., 2016; Williams et al., 2015).

7.2.3 Hypothesis 3

The results of this study indicate a positive relationship between planning and project success.

Project managers use the planning process to control and analyse the success of a project (Papke-Shields & Boyer-Wright, 2017). Time management, cost management, scope management and quality management, risk management and communication management are the constructs of planning (Ahimbisibwe et al., 2015; Khodakarami & Abdi, 2014; Sligo et al., 2017). Carvalho and Rabechini (2017) argue that planning has a positive effect on project success then it does not mean all constructs have the same relationship with the success of the project.

One of the most critical areas of project management relates to costing and completing a project on time with limited resources (Yang et al., 2016). Hence, to implement the projects, the managers must accurately plan the time in line with the project objectives, achieve financial plans and control the implementation of a project in a correct way (Zadeh et al., 2017). Therefore, at this research time management and cost management were selected from constructs.

According to the literature reviewed at chapter two, the satisfaction of stockholders is equal to project success (Fonseca et al., 2016; Harrison & Wicks, 2013; Schnackenberg & Tomlinson, 2016), and based on the stockholder theory the project management is one of the stockholders of the project (Freeman, 1994, 2004; Miles, 2017); Therefore, the project management satisfaction is a construct of project success. Then based on literature reviewed, project management success is equal with satisfaction of project management (Ofori, 2013; Radujkovic & Sjekavica, 2017); Also, according to project success framework (Todorovic et al., 2015), the success of project management is related to the tools, the same as the time management and cost management, that based on the literature reviewed, they are the constructs of planning.

Based on the finding of this research the time management and cost management have a positive relationship with project management satisfaction. Therefore, planning has a positive relationship with project success, that with increasing using the planning to control the project, the project success is increasing too.

7.3 Implicate for Management

7.3.1 Time Management

Time management consists of the expandable skills, methods, and tools which as part of planning and project management can satisfy the managers with a positive effect on the performance of the organisation and project and help the project to finish successfully (Grissom et al., 2015; Pehlivan, 2013; Williams et al., 2015). Managers are responsible for the duration of the project; They can increase or decrease the timeline of the project by making optimal decisions (Bannerman, 2008; Fu et al., 2016). With control of the time of the project by time management, managers can drive a project to success (Radujkovic & Sjekavica, 2017). Business with achieving their commitments (time), increase their credit and success, also satisfy their stakeholders.

7.3.2 Cost Management

Managers use the cost management to control, monitor, and make decisions about the planned cost of an organisation and project (Smith, 2016). With cost management the project managers control the remaining budget to finish the project without any extra cost and under the approved budget with, to categorise that project under the successful project (M. Anderson et al., 2013; Radujkovic & Sjekavica, 2017).

As mentioned by (Chen, 2015), in the business world, the credit of any business in the area that it operates is defined as its success. Cost management with monitor, control, and estimate the cost to avoid additional expense, assist the businesses to increase their credit and success, also, satisfy their stakeholders with control the budget and finish the project with a suitable cost and successfully.

7.3.3 Planning

Today the competition between companies, industries, and countries is rising (World Bank, 2018). Also, only those who succeed will be able to maintain and increase their credibility by satisfying the shareholders (Muller & Jugdev, 2012; Ofori, 2013). Planning is the flexible and extensible tools that managers can use it and its constructs to satisfy the stakeholder with control of the organisation and project in a different aspect (Papke-Shields & Boyer-Wright, 2017). Managers can use one or a combination of Time, cost, quality, scope and risk as a construct of planning (Howsawi, Eager, Bagia, & Niebecker, 2014; Osiyevskyy et al., 2016). The constructs of project planning, can have either a positive or negative effect

on the success of an organisation depending on how the constructs were managed (Fonseca et al., 2016).

7.4 Limitation of the Research

This section highlights the limitations of the research:

- The sample of this research focused only on project managers, and can therefore not be generalised towards other groups of managers.
- The timeline of this research was cross-sectional research which presented only a snapshot of the specific time. A different timeframe will produce different results.
- Different results will be produced if the constructs of planning of combined in a model with different constructs.
- This research was quantitative and used the structured questionnaire with closed-ended questions. According to the nature of it, the options of responses had limited based on the view of the researcher

7.5 Recommendation for Future Research

According to the results of this research and available literature in the concept of project management and project success, some general recommendations are added for future research:

- This research only focused on project managers, but to generalise the results, future research must use a different sample, and to validate the finding of this research need to replicate the relationships in a different sample.
- This research only used two constructs of planning and one construct of project success. For future research, it is needed to add more constructs to both parts, planning and project success.
- This research did not focus on the specific industry and country, but it is interesting if in future researches tries to focus on specific industry or country and add the impact of environmental items to the research.
- To explore the conceptual model, in addition to the literature reviewed, the stakeholder theory and project success framework was used. It is better in future research to use or adds the other theory/ frameworks.
- This research used the quantitative method, future research can utilise qualitative research to gain more insights on the studied constructs.

7.6 Conclusion

Project success still is a critical subject in academic and business domains. In the competitive and dynamic world of a project, project planning has a great chance to impact on project success. Project management can use time management and cost management as constructs of planning to impact on project stakeholders' satisfaction and make the project successful. This research contribute the academia for future research and assist businesses and consultants to better understand investment requirements in planning for their organisations.

References

Adelson, J. L. (2012). Examining relationships and effects in gifted education research: An introduction to structural equation modeling. *Gifted Child Quarterly*, *56*(1), 47–55.

Ahimbisibwe, A., Tusiime, W., & Tumuhairwe, R. (2015). The Moderating Influence of Inherent Project Risk on the Relationship between Project Planning and Perceived Project Success. *International Journal of Supply Chain Management*, *4*(3), 69–77.

Almgren, K. (2014). Information Technology Project Management Processes and Practices: A Comprehensive Study for Successful Implementation of IT Projects. *International Journal of Business and Social Science*, *5*(11), 84–92.

Anderson, J. C., & Gerbing, D. W. (1988). Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*, *103*(3), 411–423.

Anderson, M., Asdemir, O., & Tripathy, A. (2013). Use of precedent and antecedent information in strategic cost management. *Journal of Business Research*, *66*(5), 643–650.

Anderson, T. W. (2003). *An Introduction to Multivariate Statistical Analysis* (Third). NeW Jersey: A John Wiley & Sons.

Asad Mir, F., & Pinnington, A. H. (2014). Exploring the value of project management: Linking Project Management Performance and Project Success. *International Journal of Project Management*, *32*(2), 202–217.

Badewi, A. (2016). The impact of project management (PM) and benefits management (BM) practices on project success: Towards developing a project benefits governance framework. *International Journal of Project Management*, *34*(4), 761–778.

Bakhshi, J., Ireland, V., & Gorod, A. (2016). Clarifying the project complexity construct: Past, present and future. *International Journal of Project Management*, *34*(7), 1199–1213.

Bannerman, P. L. (2008). Defining Project Success: A Multilevel Framework. *In Proceedings of the Project Management Institute Research Conference*.

Belassi, W., & Tukel, O. I. (1996). A new framework for determining critical success/failure factors in projects. *International Journal of Project Management*, *14*(3), 141–151.

Bjarnason, E. (2015). *Critical Success Factors for Planning , Scheduling and Control in Design*

and Construction. Reykjavík University.

Bruni, M. E., Di Puglia Pugliese, L., Beraldi, P., & Guerriero, F. (2017). An adjustable robust optimization model for the resource-constrained project scheduling problem with uncertain activity durations. *Omega*, *71*, 66–84.

Bulmer, M. G. (1979). *Principles of Statistics* (First). New York: Dover Publications.

Cain, M. K., Zhang, Z., & Yuan, K. H. (2017). Univariate and multivariate skewness and kurtosis for measuring nonnormality: Prevalence, influence and estimation. *Behavior Research Methods*, *49*(5), 1716–1735.

Carvalho, M. M., & Rabechini, R. (2017). Can project sustainability management impact project success? An empirical study applying a contingent approach. *International Journal of Project Management*, *35*(6), 1120–1132.

Chen, H. L. (2015). Performance measurement and the prediction of capital project failure. *International Journal of Project Management*, *33*(6), 1393–1404.

Chen, H. L., Chen, W. T., & Lin, Y. L. (2016). Earned value project management: Improving the predictive power of planned value. *International Journal of Project Management*, *34*(1), 22–29.

Chittithaworn, C., Islam, M. A., & Yusuf, D. H. M. (2011). Factors affecting business success of small & medium enterprises (SMEs) in Thailand. *Asian Social Science*, *7*(5), 180–190.

Colin, J., & Vanhoucke, M. (2014). Setting tolerance limits for statistical project control using earned value management. *Omega*, *49*, 107–122.

Cooke Davie, T. (2002). The real success factors on projects. *International Journal of Project Management*, *20*, 185–190.

Coromina, L. (2014). Introduction to Structural Equation Modeling with Amos. Girona: University of Girona.

Creswell, J. W. (2013). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. (V. Knight, J. Young, K. Koscielak, B. Bauhaus, & M. Markanich, Eds.), *Research design Qualitative quantitative and mixed methods approaches* (Fourth). London: SAGE Publications, Inc.

Crucke, S., & Knockaert, M. (2016). When Stakeholder Representation Leads to Faultlines: A

Study of Board Service Performance in Social Enterprises. *Journal of Management Studies*, *53*(5), 768–793.

Davari, M., & Demeulemeester, E. (2016). The Proactive and Reactive Resource-Constrained Project Scheduling Problem: The Crucial Role of Buffer-Based Reactions. *Journal of Scheduling*, *19*(4), 409–428.

Dvir, D., & Lechler, T. (2004). Plans are nothing, changing plans is everything: the impact of changes on project success. *Research Policy*, *33*(1), 1–15.

Dvira, D., Razb, T., & Shenhar, A. J. (2003). An Empirical Analysis of the Relationship between Project Planning and Project Success project planning and project success. *International Journal of Project Management*, *21*, 89–95.

Ekrot, B., Kock, A., & Gemünden, H. G. (2016). Retaining project management competence - Antecedents and consequences. *International Journal of Project Management*, *34*(2), 145–157.

Enshassi, A., Kochendoerfer, B., & Al Ghoul, H. (2016). Factors Affecting Sustainable Performance of Construction Projects during Project Life Cycle Phases. *International Journal of Sustainable Construction Engineering & Technology*, *7*(1), 50–68.

Fisher, C., Pillemer, J., & Amabile, T. M. (2017). Deep Help in Complex Project Work: Guiding and Path-Clearing Across Difficult Terrain. *Academy of Management Journal*, *61*(4), 1–54.

Fonseca, L., Ramos, A., Rosa, A., Braga, A. C., & Sampaio, P. (2016). Stakeholders satisfaction and sustainable success. *Internationa Journal Industrial and Systems Engineering*, *24*(2), 144–157.

Fortune, J., White, D., Jugdev, K., & Walker, D. (2011). Looking again at current practice in project management. *International Journal of Managing Projects in Business*, *4*(4), 553–572.

Freeman, R. E. (1994). The Politics of Stakeholder Theory. *Business Ethics Quarterly*, *4*, 409–421.

Freeman, R. E. (2004). The Stakeholder Approach Revisited. *Zeitschrift Für Wirtschafts-Und Unternehmensethik*, *5*(3), 228–241.

Fu, R., Subramanian, A., & Venkateswaran, A. (2016). Project Characteristics, Incentives, and

Team Production. *Management Science*, *62*(3), 785–801.

Garwood, D. A., & Poole, A. H. (2018). Project management as information management in interdisciplinary research: Lots of different pieces working together. *International Journal of Information Management*, *41*, 14–22.

Gond, J. P., Cabantous, L., Harding, N., & Learmonth, M. (2016). What Do We Mean by Performativity in Organizational and Management Theory? The Uses and Abuses of Performativity. *International Journal of Management Reviews*, *18*(4), 440–463.

Grissom, J. A., Loeb, S., & Mitani, H. (2015). Principal time management skills: Explaining patterns in principals' time use, job stress, and perceived effectiveness. *Journal of Educational Administration*, *53*(6), 773–793.

Gunduz, M., & Yahya, A. M. A. (2018). Analysis of project success factors in construction industry. *Technological and Economic Development of Economy*, *24*(1), 67–80.

Habib, M. (2013). Understanding Critical Success and Failure Factors of Business Process Reengineering. *International Review of Management and Business Research*, *2*(1), 1–10.

Haleem, A., Sushil, Qadri, M. A., & Kumar, S. (2012). Analysis of critical success factors of world-class manufacturing practices: An application of interpretative structural modelling and interpretative ranking process. *Production Planning and Control*, *23*, 722–734.

Harrison, J. S., & Wicks, A. C. (2013). Stakeholder Theory, Value, and Firm Performance. *Business Ethics Quarterly*, *23*(01), 97–124.

Heagney, J. (2016). *Fundamentals of project management* (Fifth). New York: American Management Association.

Heravi, A., Coffey, V., & Trigunarsyah, B. (2015). Evaluating the level of stakeholder involvement during the project planning processes of building projects. *International Journal of Project Management*, *33*(5), 985–997.

Ho, R. (2006). *Handbook of Univariate and Multivariate Data Analysis and Interpretation with SPSS* (First). New York: Taylor & Francis Group.

Holland, S., Gaston, K., & Gomes, J. (2000). Critical success factors for cross-functional teamwork in new product development. *International Journal of Management Reviews*, *2*(3), 231–259.

Howsawi, E., Eager, D., Bagia, R., & Niebecker, K. (2014). The four-level project success framework: application and assessment. *Organisational Project Management*, *1*(1), 1–15.

Hox, J. J. & Bechger, T. M. (1998). An introduction to structural equation modeling. *Family Science Review*, *11*, 354–373.

Hu, X., Cui, N., Demeulemeester, E., & Bie, L. (2016). Incorporation of activity sensitivity measures into buffer management to manage project schedule risk. *European Journal of Operational Research*, *249*(2), 717–727.

Hu, Y., McNamara, P., & Piaskowska, D. (2016). Project suspensions and failures in new product development: Returns for entrepreneurial firms in co-development alliances. *Product Innovation Management Project*, *40*(1), 67–77.

Iyer, K. C., & Banerjee, P. S. (2016). Measuring and benchmarking managerial efficiency of project execution schedule performance. *International Journal of Project Management*, *34*(2), 219–236.

Joslin, R., & Müller, R. (2016). The impact of project methodologies on project success in different project environments. *International Journal of Managing Projects in Business*, *9*(2), 364–388.

Khodakarami, V., & Abdi, A. (2014). Project cost risk analysis: A Bayesian networks approach for modeling dependencies between cost items. *International Journal of Project Management*, *32*(7), 1233–1245.

Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling*. (D. A. Kenny & T. D. Little, Eds.) (Third). New York: Guilford Publications, Inc.

Korb, K. A. (2012). Conducting Educational Research - Adopting or Adapting an Instrument. Retrieved October 31, 2018, from http://korbedpsych.com/R09aAdopt.html

Kothari, C. (2004). *Research Mathodology : Methods and Techniques* (Second). New Delhi: New Age International Publishers.

Kr Singh, R. (2011). Analyzing the interaction of factors for success of total quality management in SMEs. *Asian Journal on Quality*, *12*(1), 6–19.

Kumar, A. (2011). *Research methodology: a step-by-step guide for beginners* (Third). London: SAGE.

Lim, C. S., & Mohamed, M. Z. (1999). Criteria of project success: An exploratory re-examination. *International Journal of Project Management*, *17*(4), 243–248.

Lindsjorn, Y., Sjoberg, D. I. K., Dingsoyr, T., Bergersen, G. R., & Dyba, T. (2016). Teamwork quality and project success in software development: A survey of agile development teams. *Journal of Systems and Software*, *122*, 274–286.

Mack, N., Woodsong, C., Macqueen, K., Guest, G., & Namey, E. (2005). *Qualitative Research Methods: A Data Collector's Field Guide* (First). North Carolina: Family Health International.

MacKerron, G., Kumar, M., Benedikt, A., & Kumar, V. (2015). Performance management of suppliers in outsourcing project: case analysis from the financial services industry. *Production Planning & Control*, *26*(2), 150–165.

Martens, A., & Vanhoucke, M. (2017). A buffer control method for top-down project control. *European Journal of Operational Research*, *262*(1), 274–286.

Martens, M. L., & Carvalho, M. M. (2017). Key factors of sustainability in project management context: A survey exploring the project managers' perspective. *International Journal of Project Management*, *35*(6), 1084–1102.

Mazzarol, T. (1998). Critical success factors for international education marketing. *International Journal of Educational Management*, *12*(4), 163–175.

Mendoza, L. E., Marius, A., Perez, M., & Griman, A. C. (2007). Critical success factors for a customer relationship management strategy. *Information and Software Technology*, *49*(8), 913–945.

Miles, S. (2017). Stakeholder Theory Classification: A Theoretical and Empirical Evaluation of Definitions. *Journal of Business Ethics*, *142*(3), 437–459.

Muller, R., & Jugdev, K. (2012). Critical success factors in projects: Pinto, Slevin, and Prescott – the elucidation of project success. *International Journal of Managing Projects in Business*, *5*(4), 757–775.

Nachtigall, C., Kroehne, U., Funke, F., & Steyer, R. (2003). (Why) should we use SEM? Pros and cons of structural equation modeling. *Methods of Psychological Research*, *8*(2), 1–22.

Oellgaard, M. J. (2013). The Performance of a Project Life Cycle Methodology in Practice.

Project Management Journal, *44*(4), 65–83.

Ofori, D. F. (2013). Project Management Practices and Critical Success Factors–A Developing Country Perspective. *International Journal of Business and Management*, *8*(21), 14–31.

Osiyevskyy, O., Costa, S. F., & Madill, C. M. (2016). Business sense or subjective satisfaction? Exploring the outcomes of business planning comprehensiveness in the SME context. *International Journal of Entrepreneurship and Innovation*, *17*(1), 15–30.

Oxford-Dictionary. (2018). Root of word: Project. Retrieved from https://en.oxforddictionaries.com/definition/project

Pallant, J. (2011). *SPSS Survival Manual - A step by step guide to data analysis using SPSS* (Fourth). Crows Nest: Allen & Unwin.

Papke-Shields, K. E., & Boyer-Wright, K. M. (2017). Strategic planning characteristics applied to project management. *International Journal of Project Management*, *35*(2), 169–179.

Paramati, S. R., Apergis, N., & Ummalla, M. (2017). Financing clean energy projects through domestic and foreign capital: The role of political cooperation among the EU, the G20 and OECD countries. *Energy Economics*, *61*, 62–71.

Pehlivan, A. (2013). The Effect of the Time Management Skills of Students Taking a Financial Accounting Course on their Course Grades and Grade Point Averages. *International Journal of Business and Social Science*, *4*(5), 196–203.

PMI. (2017). *A Guide to Project Management Body of Knowledge* (Sixth). Pennsylvania: Project Management Institute.

Prabhakar, G. P. (2008). What is Project Success: A Literature Review. *International Journal of Business and Management*, *3*, 3–10.

Radujkovic, M., & Sjekavica, M. (2017). Project Management Success Factors. *Procedia Engineering*, *196*, 607–615.

Razmdoost, K., & Mills, G. (2016). Towards a service-led relationship in project-based firms. *Construction Management and Economics*, *34*(4–5), 317–334.

Rezvani, A., Chang, A., Wiewiora, A., Ashkanasy, N. M., Jordan, P. J., & Zolin, R. (2016). Manager emotional intelligence and project success: The mediating role of job satisfaction and trust. *International Journal of Project Management*, *34*(7), 1112–1122.

Samset, K., & Volden, G. H. (2016). Front-end definition of projects: Ten paradoxes and some reflections regarding project management and project governance. *International Journal of Project Management*, *34*(2), 297–313.

Sanchez, O. P., Terlizzi, M. A., & De Moraes, H. R. de O. C. (2017). Cost and time project management success factors for information systems development projects. *International Journal of Project Management*, *35*(8), 1608–1626.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for Business Students* (Fifth). Harlow: Pearson Education Limited.

Schnackenberg, A. K., & Tomlinson, E. C. (2016). Organizational Transparency: A New Perspective on Managing Trust in Organization-Stakeholder Relationships. *Journal of Management*, *42*(7), 1784–1810.

Schonbrodt, F. D., & Perugini, M. (2013). At what sample size do correlations stabilize? *Journal of Research in Personality*, *47*(5), 609–612.

Sligo, J., Gauld, R., Roberts, V., & Villa, L. (2017). A literature review for large-scale health information system project planning, implementation and evaluation. *International Journal of Medical Informatics*, *97*, 86–97.

Smith, P. (2014). Project Cost Management – Global Issues and Challenges. *Procedia Social and Behavioral Sciences*, *119*, 485–494.

Smith, P. (2016). Global Professional Standards for Project Cost Management. *Procedia Social and Behavioral Sciences*, *226*, 124–131.

Taylor, K. J. (2016). Adopting Agile software development: the project manager experience. *Information Technology & People*, *29*(4), 670–687.

Todorovic, M. L., Petrović, D. C., Mihic, M. M., Obradovic, V. L., & Bushuyev, S. D. (2015). Project success analysis framework: A knowledge-based approach in project management. *International Journal of Project Management*, *33*(4), 772–783.

Trochim, W., & Donnelly, J. (2006). *The Research Methods Knowledge Base* (Third). Ohio: Atomic Dog.

Van den Ende, L., & Van Marrewijk, A. (2014). The ritualization of transitions in the project life cycle: A study of transition rituals in construction projects. *International Journal of Project Management*, *32*(7), 1134–1145.

van der Hoorn, B. (2015). Continental thinking: a tool for accessing the project experience. *International Journal of Managing Projects in Business*, *9*(4), 865–891.

Wilkinson, D., & Birmingham, P. (2003). *Using Research Instruments: A guide for researchers* (First). New York: RoutledgeFalmer - Taylor & Francis Group.

Williams, P., Ashill, N. J., Naumann, E., & Jackson, E. (2015). Relationship quality and satisfaction: Customer-perceived success factors for on-time projects. *International Journal of Project Management*, *33*(8), 1836–1850.

World Bank. (2018). Ideas for Action-Welcome to the 2018 Competition. Retrieved from https://www.worldbank.org/en/events/2018/01/30/ideas-for-action-2018-competition

Yang, L., Qi, J., Li, S., & Gao, Y. (2016). Collaborative optimization for train scheduling and train stop planning on high-speed railways. *Omega*, *64*, 57–76.

Yilmaz, K. (2013). Comparison of Quantitative and Qualitative Research Traditions : epistemological , theoretical. *European Journal of Education*, *48*(2), 311–325.

Yong, A. G., & Pearce, S. (2013). A Beginner's Guide to Factor Analysis: Focusing on Exploratory Factor Analysis. *Tutorials in Quantitative Methods for Psychology*, *9*(2), 79–94.

Yu, A. G., Flett, P. D., & Bowers, J. A. (2005). Developing a value-centred proposal for assessing project success. *International Journal of Project Management*, *23*(6), 428–436.

Yun, S., Choi, J., de Oliveira, D. P., & Mulva, S. P. (2016). Development of performance metrics for phase-based capital project benchmarking. *International Journal of Project Management*, *34*(3), 389–402.

Zadeh, P. A., Wang, G., Cavka, H. B., Staub-French, S., & Pottinger, R. (2017). Information Quality Assessment for Facility Management. *Advanced Engineering Informatics*, *33*, 181–205.

Zandhuis, A., & Stellingwerf, R. (2013). *ISO 21500: Guidance on Project Management* (First). Hertogenbosch: Van Haren Publishing.

Appendices

Appendix 1: Codebook

Table 27- *Codebook*

Questionnaire	Label	Code
Do you consent to the participate in this research?	Q1	
Yes		1
No		2
Years of project management experience	Experience	
Without project management experience		0
Less than 1		1
1 to less than 5		2
6 to less than 10		3
11 to less than 15		4
Great than 15 (please specify)		5
Gender	Gender	
Male		1
Female		2
Age	Age	
Less than 21		1
21-29		2
30-39		3
40-49		4
50 or older (Please Specify)		5
Highest level of education completed	Education	
Certificate/ Diploma		1
Degree		2
Post graduate		3
Other (please specify)		4
Industry you work in	Industry	
Commodities/Materials		1
Consumer Services		2
Education		3
Energy & Utilities		4
EPCM		5
Financial Services		6
Government		7
Healthcare		8
Information Technology		9
Non-profit		10
Manufacturing		11
Professional Services		12
Retail and Distribution		13
Telecommunications		14
Transportation		15
Other (please specify)		16

Source: Own research

Table 27 - Codebook

Table 27 – Codebook - Continue

Questionnaire	Label	Code
The last level of the project management that experienced by you?	Tenure	
Junior Manager		1
Middle Manager		2
Senior Manager		3
Professional Manager		4
Director		5
In which countr(-ies) have acquired your project management experience? [please specify countr(-ies) name]	Country-Exp	
Iran		1
South Africa		2
United Arab Emirates		3
United Kingdom		4
United States of America		5
Australia		6
Canada		7
Germany		8
Italy		9
Netherlands		10
Other		11
Multiple		12
In which country are you working now?	Country	
Iran		1
South Africa		2
United Arab Emirates		3
United Kingdom		4
United States of America		5
Australia		6
Canada		7
Germany		8
Italy		9
Netherlands		10
Other		11
Based on what you mentioned above, Do you think is planning efficient to the success of projects? And the positive relationship between Planning and Project success is existed?	Q30	
Yes		1
No		2

Source: Own research

Table 27 – Codebook - Continue

Variable	Construct	Questionnaire	Label	Code				
				Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Independent Variables - Planning	Time Management	A project manager will be satisfied when projects get completed on time.	T01	1	2	3	4	5
		The aspect of defining activities will satisfy the project manager.	T02	1	2	3	4	5
		Identifying and documenting relationships among project activities will satisfy the project manager.	T03	1	2	3	4	5
		Estimating the type and quantities of materials, human resources, equipment, or supplies required to perform each activity will satisfy a project manager.	T04	1	2	3	4	5
		A project manager will be satisfied with the estimated activity durations.	T05	1	2	3	4	5
		Analysing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model will satisfy the project manager.	T06	1	2	3	4	5
		A project manager will be satisfied with monitoring the status of project activities to update project progress, and manage changes to the schedule baseline to achieve the plan.	T07	1	2	3	4	5
	Cost Management	A project manager will be satisfied when projects stay within budget limits.	C01	1	2	3	4	5
		Establishing the policies, procedures, and documentation for controlling project costs (planning, managing, expending, and other costs) will satisfy the project manager.	C02	1	2	3	4	5
		Developing an approximation of the monetary resources needed to complete the project activities will satisfy the project manager.	C03	1	2	3	4	5
		Aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline will satisfy the project manager.	C04	1	2	3	4	5
		Monitoring the status of the project to update the project costs and managing changes to the cost baseline will satisfy the project manager.	C05	1	2	3	4	5

Source: Own research

Table 27 – *Continue*

Type	Construct	Questionnaire	Label	Code				
				Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Dependent Variable - Project Success	Project Management Satisfaction	From the project manager's point of view, projects meet their operational performance goals with better planning.	PS01	1	2	3	4	5
		From the project manager's point of view, projects meet their technical performance goals with better planning.	PS02	1	2	3	4	5
		From the project manager's point of view, project results meet stakeholders expectations with better planning.	PS03	1	2	3	4	5
		From the project manager's point of view, stakeholders are satisfied with project results with better planning.	PS04	1	2	3	4	5
		Based on the perception of the project manager's from the Client's view, projects meet their operational performance goals with better planning.	PS05	1	2	3	4	5
		Based on the perception of the project manager's from the Client's view, projects meet their technical performance goals with better planning.	PS06	1	2	3	4	5
		Based on the perception of the project manager's from the Client's view, projects results meet stakeholders expectations with better planning.	PS07	1	2	3	4	5
		Based on the perception of the project manager's from the Client's view, stakeholders are satisfied with project results with planning.	PS08	1	2	3	4	5

Source: Own research

Appendix 2: Consent Statement and Questionnaire

Figure 23 - *Consent Statement and Questionnaire*

Gordon Institute of Business Science
University of Pretoria

Effectiveness of project planning for project success

Consent Statement

Dear Participant, I am conducting research to understand the relationship between theplanning and success of projects. The study will also explore the relationship between both time and cost management and the satisfaction of the project manager as a stakeholder. The study's outcome will assist both academia and practice in understanding these relationships., as well as to recommend to organisations whether planning (time and cost management) is efficient to the success of projects or not, and what actions are required going forward. You are therefore kindly requested to complete a survey on a set number of questions. The survey should not take longer than 20 minutes of your time to complete. Your participation is voluntary and you can withdraw at any time without penalty. However, your participation and responses are valuable to us and we would appreciate your assistance. The information collected are part of ongoing research of MBA being undertaken at the Gordon Institute of Business Science (GIBS) and will remain confidential, and cannot be used to identify any participant. Should you have any concerns, please contact me or my supervisor.

Our contact details are as follows:

Researcher: Shahram Shariatzadeh Sigaroudi, 17337233@mygibs.co.za, +27 83 264 5865

Supervisor: Dr Ngwako Sefoko, Nsefoko@gmail.com, +27 72 368 4415

*** Required**

* 1. Do you consent to the participate in this research?

◯ Yes ◯ No

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University of Pretoria

Effectiveness of project planning for project success

Part A (Demographic)

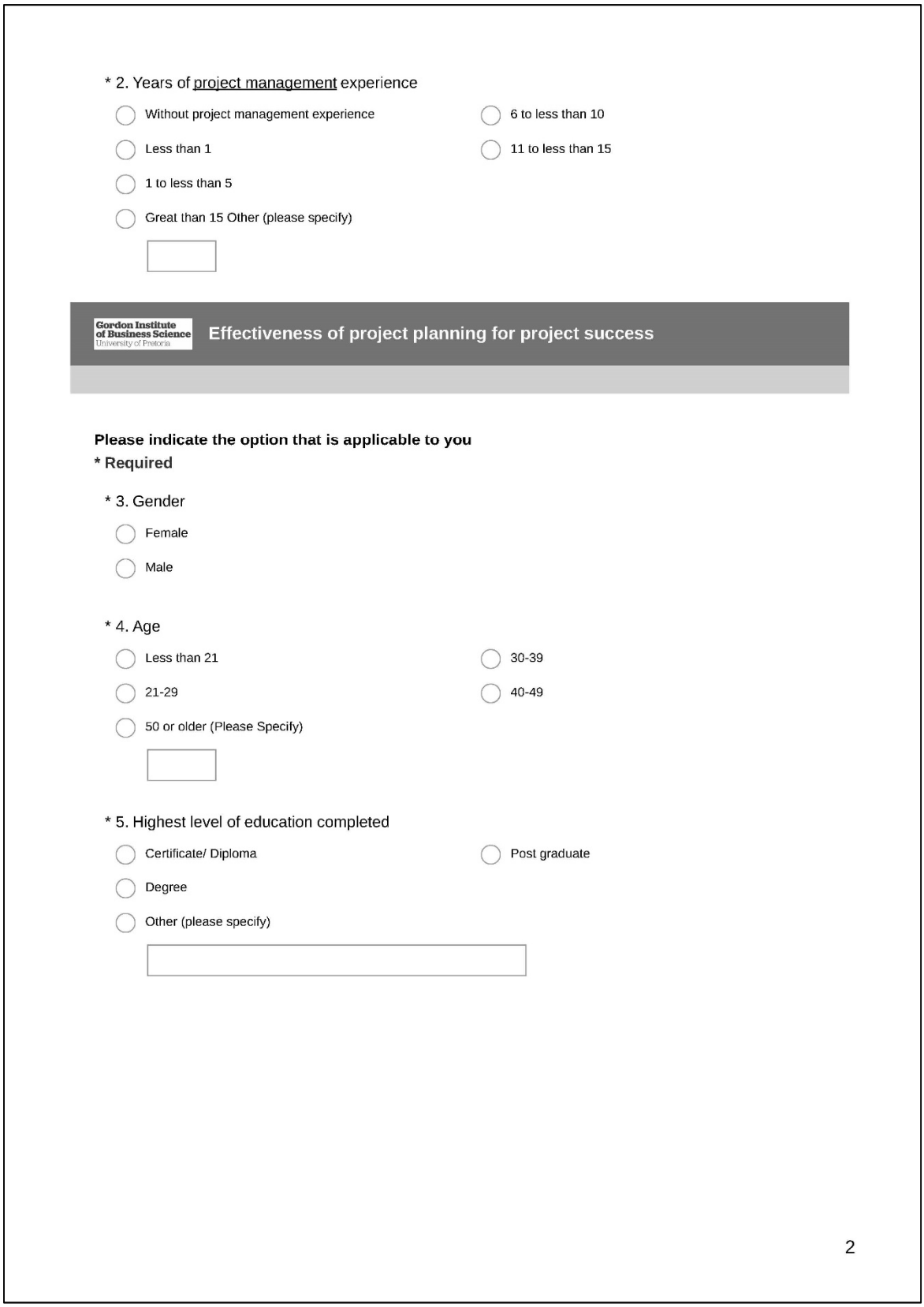
Please indicate the option that is applicable to you

*** Required**

1

Source: Own research

Figure 23 - *Consent Statement and Questionnaire – Continue*



* 2. Years of project management experience

- ◯ Without project management experience
- ◯ Less than 1
- ◯ 1 to less than 5
- ◯ Great than 15 Other (please specify)
- ◯ 6 to less than 10
- ◯ 11 to less than 15

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Effectiveness of project planning for project success

Please indicate the option that is applicable to you
*** Required**

* 3. Gender

- ◯ Female
- ◯ Male

* 4. Age

- ◯ Less than 21
- ◯ 21-29
- ◯ 50 or older (Please Specify)
- ◯ 30-39
- ◯ 40-49

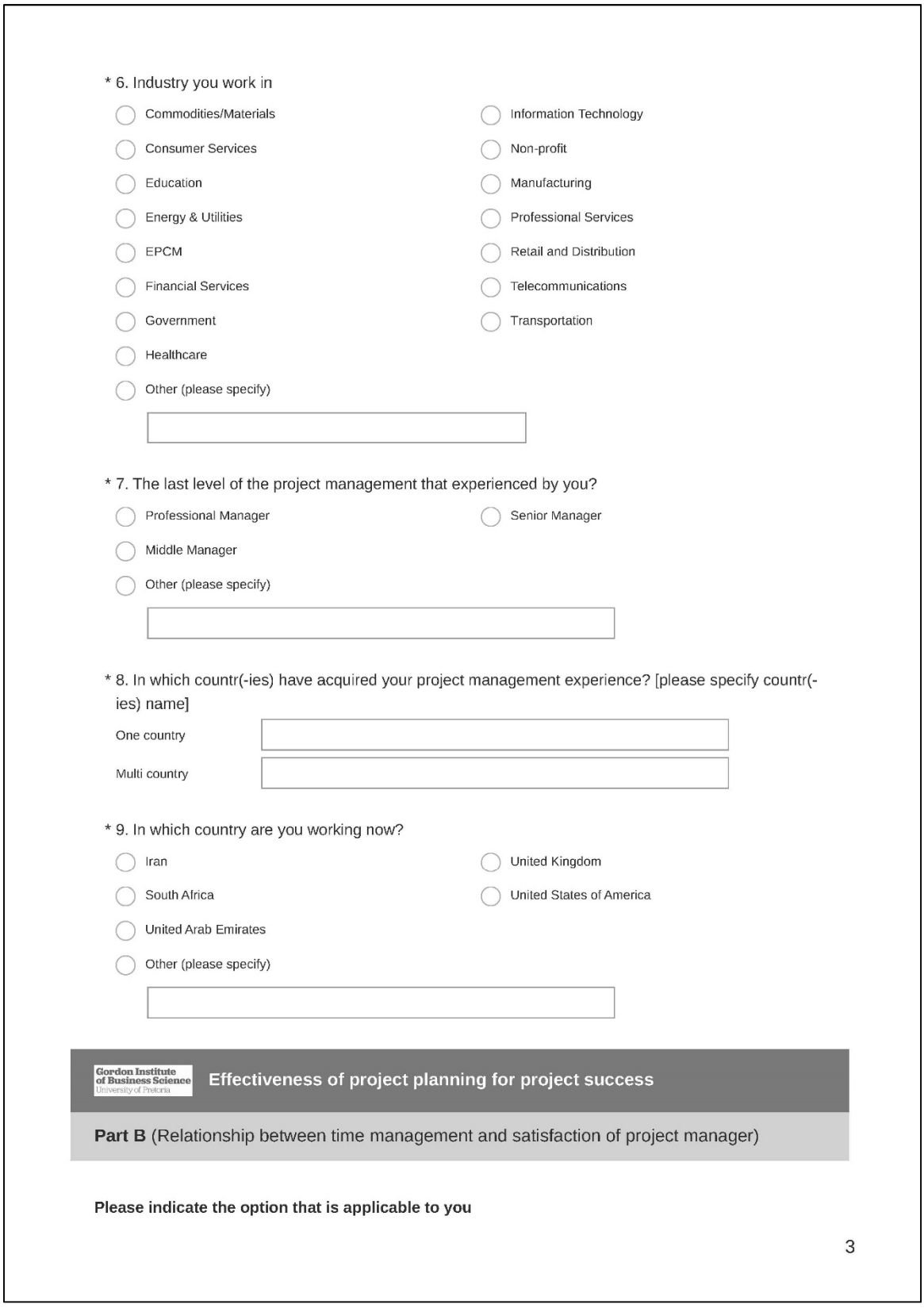
* 5. Highest level of education completed

- ◯ Certificate/ Diploma
- ◯ Degree
- ◯ Other (please specify)
- ◯ Post graduate

2

Source: Own research

Figure 23 - *Consent Statement and Questionnaire – Continue*



* 6. Industry you work in

- ◯ Commodities/Materials
- ◯ Consumer Services
- ◯ Education
- ◯ Energy & Utilities
- ◯ EPCM
- ◯ Financial Services
- ◯ Government
- ◯ Healthcare
- ◯ Other (please specify)
- ◯ Information Technology
- ◯ Non-profit
- ◯ Manufacturing
- ◯ Professional Services
- ◯ Retail and Distribution
- ◯ Telecommunications
- ◯ Transportation

* 7. The last level of the project management that experienced by you?

- ◯ Professional Manager
- ◯ Middle Manager
- ◯ Other (please specify)
- ◯ Senior Manager

* 8. In which countr(-ies) have acquired your project management experience? [please specify countr(-ies) name]

One country

Multi country

* 9. In which country are you working now?

- ◯ Iran
- ◯ South Africa
- ◯ United Arab Emirates
- ◯ Other (please specify)
- ◯ United Kingdom
- ◯ United States of America

Gordon Institute of Business Science, University of Pretoria

Effectiveness of project planning for project success

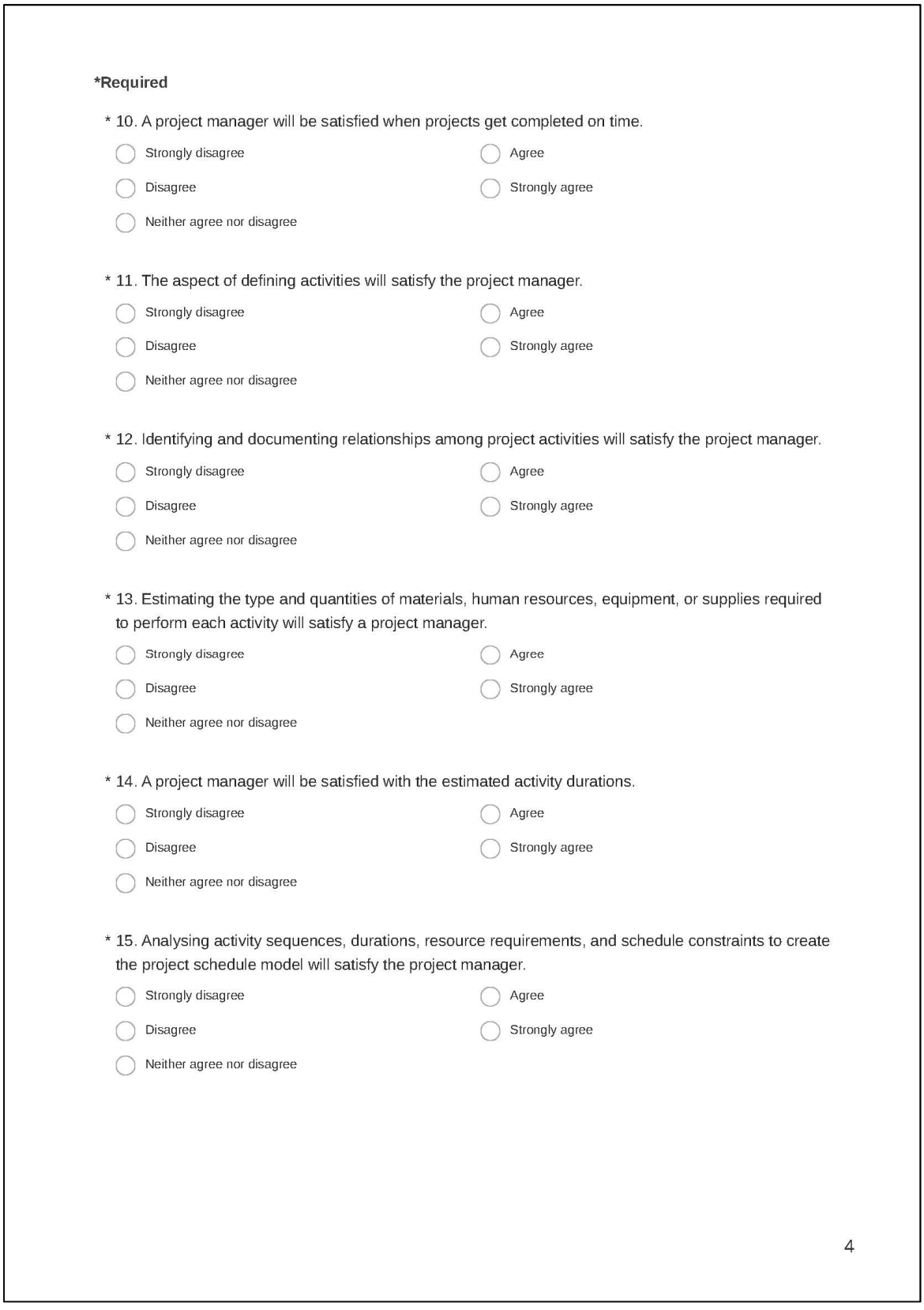
Part B (Relationship between time management and satisfaction of project manager)

Please indicate the option that is applicable to you

3

Source: Own research

Figure 23 - *Consent Statement and Questionnaire – Continue*



***Required**

* 10. A project manager will be satisfied when projects get completed on time.

- ◯ Strongly disagree
- ◯ Disagree
- ◯ Neither agree nor disagree
- ◯ Agree
- ◯ Strongly agree

* 11. The aspect of defining activities will satisfy the project manager.

- ◯ Strongly disagree
- ◯ Disagree
- ◯ Neither agree nor disagree
- ◯ Agree
- ◯ Strongly agree

* 12. Identifying and documenting relationships among project activities will satisfy the project manager.

- ◯ Strongly disagree
- ◯ Disagree
- ◯ Neither agree nor disagree
- ◯ Agree
- ◯ Strongly agree

* 13. Estimating the type and quantities of materials, human resources, equipment, or supplies required to perform each activity will satisfy a project manager.

- ◯ Strongly disagree
- ◯ Disagree
- ◯ Neither agree nor disagree
- ◯ Agree
- ◯ Strongly agree

* 14. A project manager will be satisfied with the estimated activity durations.

- ◯ Strongly disagree
- ◯ Disagree
- ◯ Neither agree nor disagree
- ◯ Agree
- ◯ Strongly agree

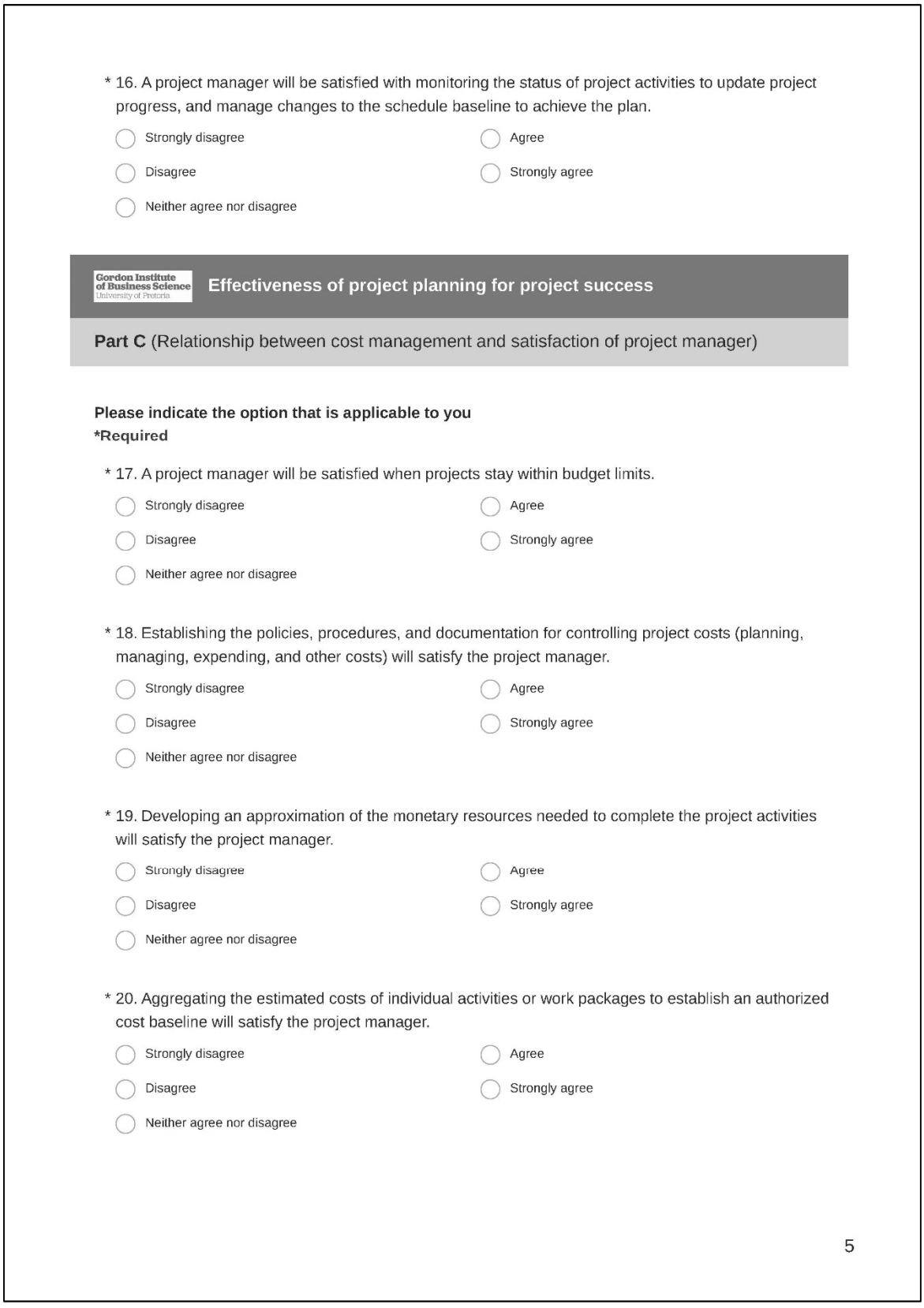
* 15. Analysing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model will satisfy the project manager.

- ◯ Strongly disagree
- ◯ Disagree
- ◯ Neither agree nor disagree
- ◯ Agree
- ◯ Strongly agree

4

Source: Own research

Figure 23 - *Consent Statement and Questionnaire – Continue*



* 16. A project manager will be satisfied with monitoring the status of project activities to update project progress, and manage changes to the schedule baseline to achieve the plan.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

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Effectiveness of project planning for project success

Part C (Relationship between cost management and satisfaction of project manager)

Please indicate the option that is applicable to you
***Required**

* 17. A project manager will be satisfied when projects stay within budget limits.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

* 18. Establishing the policies, procedures, and documentation for controlling project costs (planning, managing, expending, and other costs) will satisfy the project manager.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

* 19. Developing an approximation of the monetary resources needed to complete the project activities will satisfy the project manager.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

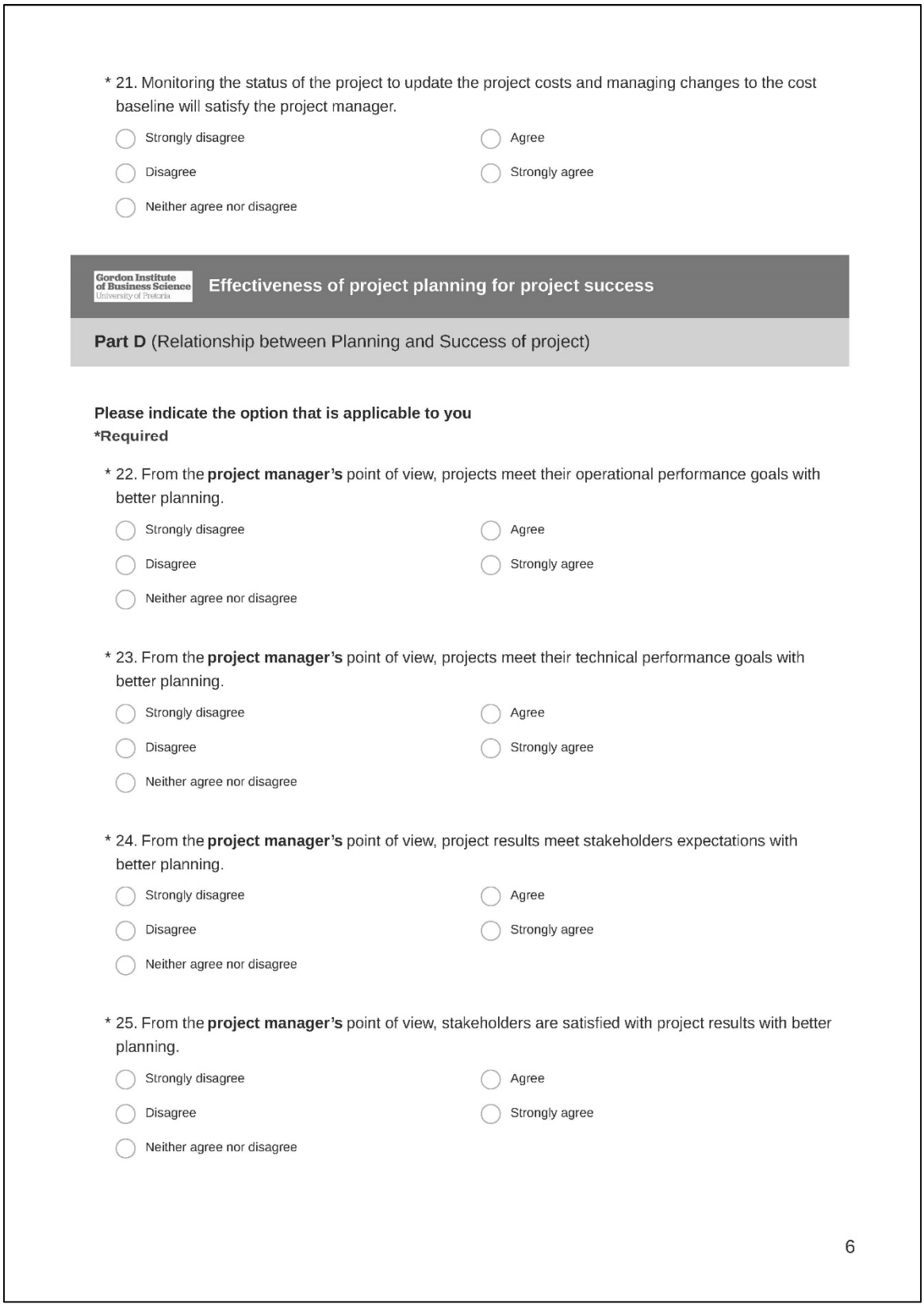
* 20. Aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline will satisfy the project manager.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

5

Source: Own research

Figure 23 - *Consent Statement and Questionnaire – Continue*



* 21. Monitoring the status of the project to update the project costs and managing changes to the cost baseline will satisfy the project manager.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

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Effectiveness of project planning for project success

Part D (Relationship between Planning and Success of project)

Please indicate the option that is applicable to you
***Required**

* 22. From the **project manager's** point of view, projects meet their operational performance goals with better planning.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

* 23. From the **project manager's** point of view, projects meet their technical performance goals with better planning.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

* 24. From the **project manager's** point of view, project results meet stakeholders expectations with better planning.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

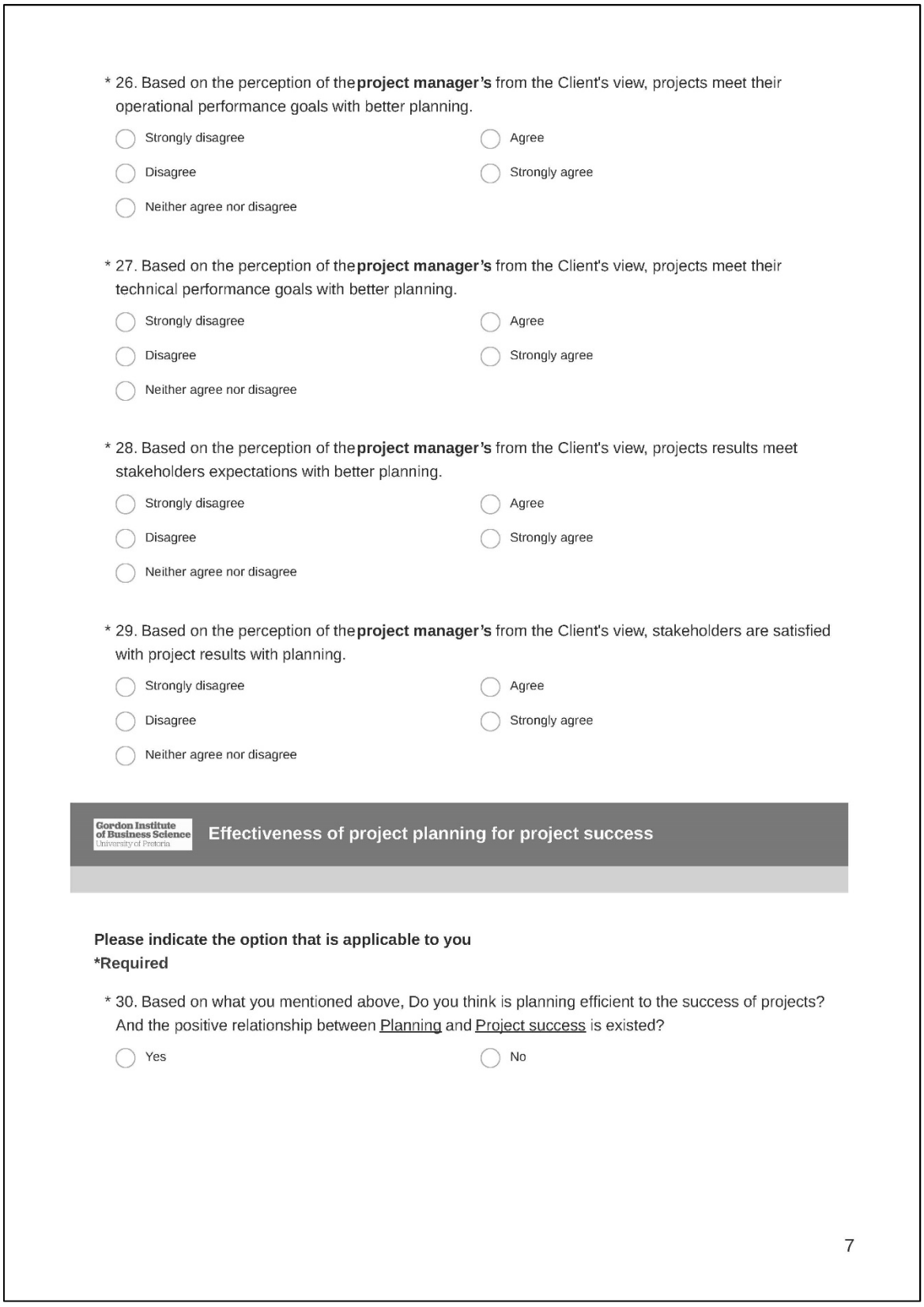
* 25. From the **project manager's** point of view, stakeholders are satisfied with project results with better planning.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

6

Source: Own research

Figure 23 - *Consent Statement and Questionnaire – Continue*



* 26. Based on the perception of the **project manager's** from the Client's view, projects meet their operational performance goals with better planning.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

* 27. Based on the perception of the **project manager's** from the Client's view, projects meet their technical performance goals with better planning.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

* 28. Based on the perception of the **project manager's** from the Client's view, projects results meet stakeholders expectations with better planning.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

* 29. Based on the perception of the **project manager's** from the Client's view, stakeholders are satisfied with project results with planning.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

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Effectiveness of project planning for project success

Please indicate the option that is applicable to you
***Required**

* 30. Based on what you mentioned above, Do you think is planning efficient to the success of projects? And the positive relationship between Planning and Project success is existed?

- Yes
- No

7

Source: Own research

Appendix 3: Mahalanobis distance

Table 28

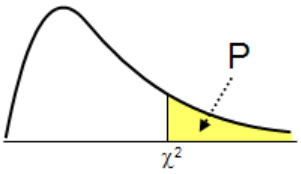
Mahalanobis - Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.6587	10.4264	6.8179	1.27126	147
Std. Predicted Value	-4.058	2.839	0.000	1.000	147
Standard Error of Predicted Value	0.651	2.807	1.275	0.405	147
Adjusted Predicted Value	-4.5561	13.1691	6.8307	1.71527	147
Residual	-6.45406	11.36409	0.00000	3.28689	147
Std. Residual	-1.824	3.212	0.000	0.929	147
Stud. Residual	-2.100	3.391	-0.002	1.012	147
Deleted Residual	-8.55511	12.66763	-0.01286	3.94885	147
Stud. Deleted Residual	-2.129	3.543	0.000	1.023	147
Mahal. Distance	3.945	90.900	19.864	13.869	147
Cook's Distance	0.000	0.233	0.010	0.024	147
Centered Leverage Value	0.027	0.623	0.136	0.095	147

a. Dependent Variable: random

Source: Own research

Figure 24 - *Mahalanobis - Value of the chi-Squared distribution*



	P										
DF	**0.995**	**0.975**	**0.20**	**0.10**	**0.05**	**0.025**	**0.02**	**0.01**	**0.005**	**0.002**	**0.001**
1	0.0000393	0.000982	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.550	10.828
2	0.0100	0.0506	3.219	4.605	5.991	7.378	7.824	9.210	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.860	16.924	18.467
5	0.412	0.831	7.289	9.236	11.070	12.833	13.388	15.086	16.750	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.690	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.180	11.030	13.362	15.507	17.535	18.168	20.090	21.955	24.352	26.124
9	1.735	2.700	12.242	14.684	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.987	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.275	19.675	21.920	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.549	21.026	23.337	24.054	26.217	28.300	30.957	32.909
13	3.565	5.009	16.985	19.812	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.064	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.307	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.542	26.296	28.845	29.633	32.000	34.267	37.146	39.252
17	5.697	7.564	21.615	24.769	27.587	30.191	30.995	33.409	35.718	38.648	40.790
18	6.265	8.231	22.760	25.989	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.900	27.204	30.144	32.852	33.687	36.191	38.582	41.610	43.820
20	7.434	9.591	25.038	28.412	31.410	34.170	35.020	37.566	39.997	43.072	45.315

Source: Own research

Table 29

Mahalanobis - per ID

Row	ID	Mahalanobis		Row	ID	Mahalanobis	Row	ID	Mahalanobis	Row	ID	Mahalanobis
1	113	90.90	Must remove	38	139	25.15	75	60	17.32	112	141	9.39
2	171	71.21	Must remove	39	117	24.90	76	151	17.23	113	153	9.31
3	147	65.64	Must remove	40	75	24.66	77	90	17.18	114	118	8.79
4	152	56.99	Must remove	41	77	24.35	78	57	17.18	115	170	8.72
5	146	51.69	Must remove	42	70	24.08	79	83	17.15	116	50	8.49
6	166	50.90	Must remove	43	58	23.81	80	41	16.88	117	51	8.49
7	144	45.43	Must remove	44	68	23.74	81	145	16.39	118	52	8.49
8	168	45.34	Must remove	45	101	23.28	82	67	16.25	119	78	8.49
9	159	43.41		46	48	23.15	83	91	16.16	120	132	8.13
10	163	41.16		47	108	22.79	84	173	15.80	121	14	7.35
11	155	39.75		48	64	22.66	85	63	15.61	122	27	7.35
12	135	39.33		49	136	22.32	86	66	15.56	123	36	7.35
13	131	38.79		50	56	22.16	87	44	15.19	124	84	7.33
14	142	38.46		51	100	22.07	88	174	14.70	125	19	7.33
15	143	38.23		52	112	21.34	89	72	14.61	126	24	7.33
16	150	37.85		53	107	21.20	90	165	14.41	127	25	7.33
17	162	37.41		54	140	20.75	91	42	14.03	128	35	7.33
18	124	34.86		55	122	20.49	92	138	13.92	129	15	6.73
19	127	33.93		56	149	20.36	93	86	13.78	130	23	6.73
20	73	33.63		57	109	20.31	94	120	13.55	131	92	6.42
21	115	32.88		58	126	20.29	95	61	12.95	132	13	6.15
22	169	31.93		59	105	20.26	96	96	12.83	133	17	6.15
23	116	30.99		60	95	20.20	97	97	12.46	134	26	6.15
24	148	29.23		61	157	20.10	98	121	12.10	135	28	6.15
25	65	28.28		62	104	19.55	99	160	12.07	136	74	6.05
26	99	28.12		63	45	19.51	100	88	11.48	137	7	4.62
27	98	28.08		64	62	19.37	101	158	10.93	138	10	4.62
28	164	27.82		65	110	19.07	102	172	10.82	139	18	4.62
29	167	27.81		66	59	19.01	103	40	10.67	140	20	4.62
30	111	27.30		67	102	18.71	104	49	10.62	141	12	4.51
31	128	27.02		68	133	18.63	105	55	10.56	142	16	4.51
32	161	26.00		69	71	18.42	106	123	10.17	143	46	4.51
33	106	25.89		70	54	18.16	107	94	10.12	144	47	4.42
34	79	25.80		71	80	17.84	108	119	10.07	145	76	4.42
35	43	25.74		72	156	17.72	109	69	9.75	146	85	4.42
36	82	25.24		73	103	17.68	110	81	9.74	147	87	3.94
37	130	25.22		74	134	17.50	111	53	9.52			

Source: Own research

Appendix 4: Test of normality (skewness and kurtosis)

Table 30 - *Test of normality (Skewness and Kurtosis) – Statistics*

		Experience	Gender	Age	Education	Industry	Tenure	Country Experience	Country
N	Valid	139	139	139	139	139	139	139	139
	Missing	0	0	0	0	0	0	0	0
Skewness		-0.547	0.102	0.111	-0.671	1.031	0.210	0.420	0.544
Kurtosis		0.696	-2.019	-0.334	-0.575	0.334	0.169	-1.209	-1.114

		T1	T2	T3	T4	T5	T6	T7
N	Valid	139	139	139	139	139	139	139
	Missing	0	0	0	0	0	0	0
Skewness		-0.852	-0.441	-0.064	0.056	-0.493	-0.026	-0.059
Kurtosis		1.340	-0.864	-1.113	-1.618	-0.686	-1.331	-1.625

		C1	C2	C3	C4	C5
N	Valid	139	139	139	139	139
	Missing	0	0	0	0	0
Skewness		-0.382	-0.853	-0.915	-1.234	-0.584
Kurtosis		-1.477	1.003	1.470	1.867	-0.728

		PS1	PS2	PS3	PS4	PS5	PS6	PS7	PS8
N	Valid	139	139	139	139	139	139	139	139
	Missing	0	0	0	0	0	0	0	0
Skewness		-0.899	-0.106	-0.503	-0.503	-0.536	0.000	-0.300	-0.329
Kurtosis		2.021	-1.034	0.258	0.258	-0.221	-1.217	-0.701	-0.814

Source: Own research

Appendix 5: Frequency analysis

Table 31 - *Frequency - Demography*

		Experience	Gender	Age	Education	Industry	Tenure	Country Experience	Country
N	Valid	139	139	139	139	139	139	139	139
	Missing	0	0	0	0	0	0	0	0
Mean		2.81	1.47	3.60	2.41	7.37	2.76	5.72	4.66
Std. Error of Mean		0.077	0.043	0.062	0.056	0.295	0.058	0.313	0.248
Median		3.00	1.00	4.00	3.00	6.00	3.00	5.00	4.00
Std. Deviation		0.908	0.501	0.729	0.657	3.481	0.687	3.695	2.926
Variance		0.824	0.251	0.532	0.432	12.118	0.472	13.653	8.559
Range		5	1	3	2	15	4	11	10
Minimum		0	1	2	1	1	1	1	1
Maximum		5	2	5	3	16	5	12	11

Source: Own research

Table 32 - *Frequency - Time Management*

		T1	T2	T3	T4	T5	T6	T7
N	Valid	139	139	139	139	139	139	139
	Missing	0	0	0	0	0	0	0
Mean		4.54	4.48	4.41	4.45	4.45	4.43	4.47
Std. Error of Mean		0.046	0.047	0.045	0.044	0.049	0.045	0.044
Median		5.00	5.00	4.00	4.00	4.00	4.00	4.00
Std. Deviation		0.542	0.556	0.536	0.513	0.580	0.525	0.515
Variance		0.294	0.309	0.287	0.263	0.337	0.276	0.266
Range		3	2	2	2	2	2	2
Minimum		2	3	3	3	3	3	3
Maximum		5	5	5	5	5	5	5

Mean Score is 4.46

Source: Own research

Table 33 - *Frequency - Cost Management*

		C1	C2	C3	C4	C5
N	Valid	139	139	139	139	139
	Missing	0	0	0	0	0
Mean		4.55	4.49	4.55	4.44	4.52
Std. Error of Mean		0.044	0.049	0.046	0.058	0.047
Median		5.00	5.00	5.00	5.00	5.00
Std. Deviation		0.513	0.582	0.541	0.682	0.556
Variance		0.263	0.339	0.292	0.465	0.309
Range		2	3	3	3	2
Minimum		3	2	2	2	3
Maximum		5	5	5	5	5

Mean Score is 4.51

Source: Own research

Table 34 - *Frequency -Project Management Satisfaction/ Project Success*

		PS1	PS2	PS3	PS4	PS5	PS6	PS7	PS8
N	Valid	139	139	139	139	139	139	139	139
	Missing	0	0	0	0	0	0	0	0
Mean		4.32	3.91	4.29	4.29	4.27	3.89	4.25	4.24
Std. Error of Mean		0.054	0.072	0.054	0.054	0.058	0.073	0.055	0.057
Median		4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Std. Deviation		0.637	0.850	0.631	0.631	0.687	0.857	0.649	0.677
Variance		0.406	0.723	0.398	0.398	0.472	0.735	0.422	0.458
Range		3	3	3	3	3	3	2	2
Minimum		2	2	2	2	2	2	3	3
Maximum		5	5	5	5	5	5	5	5

Mean Score is 4.51

Source: Own research

Table 35 - *Frequency - Demography - Experience*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No PM experience	3	2.2	2.2	2.2
	Less than 1 year	5	3.6	3.6	5.8
	1 to 5 years	39	28.1	28.1	33.8
	6 to 10 years	62	44.6	44.6	78.4
	11 to 15 years	29	20.9	20.9	99.3
	More than 15 years	1	0.7	0.7	100.0
	Total	139	100.0	100.0	

Source: Own research

Table 36 - *Frequency - Demography - Gender*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	73	52.5	52.5	52.5
	Female	66	47.5	47.5	100.0
	Total	139	100.0	100.0	

Source: Own research

Table 37 - *Frequency - Demography - Age*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21 to 29	6	4.3	4.3	4.3
	31 to 39	58	41.7	41.7	46.0
	41 to 49	61	43.9	43.9	89.9
	50 and older	14	10.1	10.1	100.0
	Total	139	100.0	100.0	

Source: Own research

Table 38 - *Frequency - Demography - Education*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Certificate or diploma	13	9.4	9.4	9.4
	Degree	56	40.3	40.3	49.6
	Post graduate	70	50.4	50.4	100.0
	Total	139	100.0	100.0	

Source: Own research

Table 39 - *Frequency - Demography - Management experience - Industry*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Commodities/Materials	2	1.4	1.4	1.4
	Consumer Services	2	1.4	1.4	2.9
	Education	3	2.2	2.2	5.0
	Energy & Utilities	5	3.6	3.6	8.6
	EPCM	39	28.1	28.1	36.7
	Financial Services	36	25.9	25.9	62.6
	Government	4	2.9	2.9	65.5
	Healthcare	1	0.7	0.7	66.2
	Information Technology	19	13.7	13.7	79.9
	Manufacturing	11	7.9	7.9	87.8
	Professional Services	1	0.7	0.7	88.5
	Retail and Distribution	1	0.7	0.7	89.2
	Telecommunications	5	3.6	3.6	92.8
	Transportation	5	3.6	3.6	96.4
	Other	5	3.6	3.6	100.0
	Total	139	100.0	100.0	

Source: Own research

Table 40 - *Frequency - Demography - Management experience - Latest level*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Junior Manager	2	1.4	1.4	1.4
	Middle Manager	46	33.1	33.1	34.5
	Senior Manager	75	54.0	54.0	88.5
	Professional Manager	15	10.8	10.8	99.3
	Director	1	0.7	0.7	100.0
	Total	139	100.0	100.0	

Source: Own research

Table 41 - *Frequency - Demography - Management experience - Country*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Iran	5	3.6	3.6	3.6
	South Africa	48	34.5	34.5	38.1
	United Arab Emirates	1	0.7	0.7	38.8
	United Kingdom	2	1.4	1.4	40.3
	United States of America	19	13.7	13.7	54.0
	Australia	11	7.9	7.9	61.9
	Canada	9	6.5	6.5	68.3
	Germany	4	2.9	2.9	71.2
	Italy	11	7.9	7.9	79.1
	Netherlands	9	6.5	6.5	85.6
	Other	2	1.4	1.4	87.1
	Multiple countries	18	12.9	12.9	100.0
	Total	139	100.0	100.0	

Source: Own research

Table 42 - *Frequency - Demography - Country - Working now*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Iran	5	3.6	3.6	3.6
	South Africa	55	39.6	39.6	43.2
	United Arab Emirates	7	5.0	5.0	48.2
	United Kingdom	3	2.2	2.2	50.4
	United States of America	19	13.7	13.7	64.0
	Australia	10	7.2	7.2	71.2
	Canada	10	7.2	7.2	78.4
	Germany	7	5.0	5.0	83.5
	Italy	12	8.6	8.6	92.1
	Netherlands	10	7.2	7.2	99.3
	Other	1	0.7	0.7	100.0
	Total	139	100.0	100.0	

Source: Own research

Appendix 6: Principal Component Analysis

Table 43 - Principal Component analysis - Descriptive Statistics

	Mean	Std. Deviation	Analysis N		Mean	Std. Deviation	Analysis N		Mean	Std. Deviation	Analysis N
T1	4.54	0.542	139	**C1**	4.55	0.513	139	**PS1**	4.32	0.637	139
T2	4.48	0.556	139	**C2**	4.49	0.582	139	**PS2**	3.91	0.850	139
T3	4.41	0.536	139	**C3**	4.55	0.541	139	**PS3**	4.29	0.631	139
T4	4.45	0.513	139	**C4**	4.44	0.682	139	**PS4**	4.29	0.631	139
T5	4.45	0.580	139	**C5**	4.52	0.556	139	**PS5**	4.27	0.687	139
T6	4.43	0.525	139					**PS6**	3.89	0.857	139
T7	4.47	0.515	139					**PS7**	4.25	0.649	139
								PS8	4.24	0.677	139

Source: Own research

Table 44 - *Principal Component analysis - Correlation Matrix*[a]

		T1	T2	T3	T4	T5	T6	T7	C1	C2	C3	C4	C5	PS1	PS2	PS3	PS4	PS5	PS6	PS7	PS8
Correlation	**T1**	1.000	0.477	0.405	0.249	0.254	0.372	0.373	0.246	0.053	0.085	0.080	0.124	0.005	0.016	0.019	0.019	0.117	0.095	0.105	0.142
	T2	0.477	1.000	0.572	0.384	0.620	0.448	0.384	0.099	0.206	0.286	0.183	0.218	0.098	0.142	0.088	0.170	0.136	0.079	0.123	0.156
	T3	0.405	0.572	1.000	0.516	0.517	0.576	0.366	0.038	0.212	0.261	0.277	0.303	0.042	0.069	0.133	0.261	0.193	0.081	0.222	0.269
	T4	0.249	0.384	0.516	1.000	0.363	0.329	0.536	-0.037	0.210	0.095	0.141	0.149	0.030	0.013	0.016	0.016	0.072	-0.055	0.030	0.048
	T5	0.254	0.620	0.517	0.363	1.000	0.471	0.293	0.027	0.197	0.233	0.281	0.278	0.060	0.013	0.186	0.186	0.168	0.070	0.176	0.241
	T6	0.372	0.448	0.576	0.329	0.471	1.000	0.576	0.047	0.229	0.275	0.216	0.221	0.108	0.059	0.182	0.182	0.282	0.088	0.253	0.280
	T7	0.373	0.384	0.366	0.536	0.293	0.576	1.000	0.122	0.138	0.063	0.145	0.071	0.113	0.086	0.168	0.123	0.152	0.002	0.160	0.152
	C1	0.246	0.099	0.038	-0.037	0.027	0.047	0.122	1.000	0.372	0.270	0.253	0.257	-0.053	-0.096	-0.105	-0.105	-0.010	-0.094	0.057	0.036
	C2	0.053	0.206	0.212	0.210	0.197	0.229	0.138	0.372	1.000	0.583	0.477	0.353	-0.049	-0.170	0.058	0.038	0.107	-0.082	0.132	0.089
	C3	0.085	0.286	0.261	0.095	0.233	0.275	0.063	0.270	0.583	1.000	0.417	0.436	0.034	-0.028	0.261	0.219	0.283	0.020	0.281	0.292
	C4	0.080	0.183	0.277	0.141	0.281	0.216	0.145	0.253	0.477	0.417	1.000	0.619	0.012	-0.004	0.084	0.051	0.105	-0.042	0.256	0.228
	C5	0.124	0.218	0.303	0.149	0.278	0.221	0.071	0.257	0.353	0.436	0.619	1.000	0.045	-0.019	0.098	0.098	0.111	0.027	0.218	0.210
	PS1	0.005	0.098	0.042	0.030	0.060	0.108	0.113	-0.053	-0.049	0.034	0.012	0.045	1.000	0.469	0.613	0.397	0.435	0.368	0.419	0.446
	PS2	0.016	0.142	0.069	0.013	0.013	0.059	0.086	-0.096	-0.170	-0.028	-0.004	-0.019	0.469	1.000	0.403	0.322	0.291	0.702	0.279	0.266
	PS3	0.019	0.088	0.133	0.016	0.186	0.182	0.168	-0.105	0.058	0.261	0.084	0.098	0.613	0.403	1.000	0.654	0.637	0.448	0.578	0.582
	PS4	0.019	0.170	0.261	0.016	0.186	0.182	0.123	-0.105	0.038	0.219	0.051	0.098	0.397	0.322	0.654	1.000	0.553	0.461	0.667	0.616
	PS5	0.117	0.136	0.193	0.072	0.168	0.282	0.152	-0.010	0.107	0.283	0.105	0.111	0.435	0.291	0.637	0.553	1.000	0.480	0.661	0.627
	PS6	0.095	0.079	0.081	-0.055	0.070	0.088	0.002	-0.094	-0.082	0.020	-0.042	0.027	0.368	0.702	0.448	0.461	0.480	1.000	0.544	0.419
	PS7	0.105	0.123	0.222	0.030	0.176	0.253	0.160	0.057	0.132	0.281	0.256	0.218	0.419	0.279	0.578	0.667	0.661	0.544	1.000	0.770
	PS8	0.142	0.156	0.269	0.048	0.241	0.280	0.152	0.036	0.089	0.292	0.228	0.210	0.446	0.266	0.582	0.616	0.627	0.419	0.770	1.000
Sig. (1-tailed)	**T1**		0.000	0.000	0.002	0.001	0.000	0.000	0.002	0.268	0.159	0.174	0.073	0.475	0.426	0.414	0.414	0.084	0.133	0.109	0.047
	T2	0.000		0.000	0.000	0.000	0.000	0.000	0.124	0.007	0.000	0.015	0.005	0.126	0.048	0.153	0.023	0.055	0.176	0.075	0.033
	T3	0.000	0.000		0.000	0.000	0.000	0.000	0.330	0.006	0.001	0.000	0.000	0.314	0.210	0.060	0.001	0.011	0.171	0.004	0.001
	T4	0.002	0.000	0.000		0.000	0.000	0.000	0.333	0.006	0.132	0.049	0.040	0.361	0.438	0.426	0.426	0.200	0.262	0.362	0.289
	T5	0.001	0.000	0.000	0.000		0.000	0.000	0.377	0.010	0.003	0.000	0.000	0.242	0.439	0.014	0.014	0.024	0.207	0.019	0.002
	T6	0.000	0.000	0.000	0.000	0.000		0.000	0.290	0.003	0.001	0.005	0.004	0.102	0.247	0.016	0.016	0.000	0.151	0.001	0.000
	T7	0.000	0.000	0.000	0.000	0.000	0.000		0.077	0.053	0.229	0.044	0.203	0.093	0.158	0.024	0.074	0.037	0.491	0.030	0.037
	C1	0.002	0.124	0.330	0.333	0.377	0.290	0.077		0.000	0.001	0.001	0.001	0.269	0.130	0.108	0.108	0.453	0.136	0.253	0.337
	C2	0.268	0.007	0.006	0.006	0.010	0.003	0.053	0.000		0.000	0.000	0.000	0.282	0.022	0.248	0.327	0.105	0.168	0.061	0.148
	C3	0.159	0.000	0.001	0.132	0.003	0.001	0.229	0.001	0.000		0.000	0.000	0.345	0.370	0.001	0.005	0.000	0.405	0.000	0.000
	C4	0.174	0.015	0.000	0.049	0.000	0.005	0.044	0.001	0.000	0.000		0.000	0.447	0.483	0.162	0.277	0.110	0.310	0.001	0.003
	C5	0.073	0.005	0.000	0.040	0.000	0.004	0.203	0.001	0.000	0.000	0.000		0.299	0.410	0.125	0.125	0.097	0.377	0.005	0.007
	PS1	0.475	0.126	0.314	0.361	0.242	0.102	0.093	0.269	0.282	0.345	0.447	0.299		0.000	0.000	0.000	0.000	0.000	0.000	0.000
	PS2	0.426	0.048	0.210	0.438	0.439	0.247	0.158	0.130	0.022	0.370	0.483	0.410	0.000		0.000	0.000	0.000	0.000	0.000	0.001
	PS3	0.414	0.153	0.060	0.426	0.014	0.016	0.024	0.108	0.248	0.001	0.162	0.125	0.000	0.000		0.000	0.000	0.000	0.000	0.000
	PS4	0.414	0.023	0.001	0.426	0.014	0.016	0.074	0.108	0.327	0.005	0.277	0.125	0.000	0.000	0.000		0.000	0.000	0.000	0.000
	PS5	0.084	0.055	0.011	0.200	0.024	0.000	0.037	0.453	0.105	0.000	0.110	0.097	0.000	0.000	0.000	0.000		0.000	0.000	0.000
	PS6	0.133	0.176	0.171	0.262	0.207	0.151	0.491	0.136	0.168	0.405	0.310	0.377	0.000	0.000	0.000	0.000	0.000		0.000	0.000
	PS7	0.109	0.075	0.004	0.362	0.019	0.001	0.030	0.253	0.061	0.000	0.001	0.005	0.000	0.000	0.000	0.000	0.000	0.000		0.000
	PS8	0.047	0.033	0.001	0.289	0.002	0.000	0.037	0.337	0.148	0.000	0.003	0.007	0.000	0.001	0.000	0.000	0.000	0.000	0.000	

a. Determinant = 2.990E-5

Source: Own research

Appendix 7: Exploratory Factor Analysis

Five Factors

Table 45 - *Exploratory Factor Analysis - KMO and Bartlett's Test - Five factors*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.750
Bartlett's Test of Sphericity	**Approx. Chi-Square**	1359.512
	df	190
	Sig.	0.000

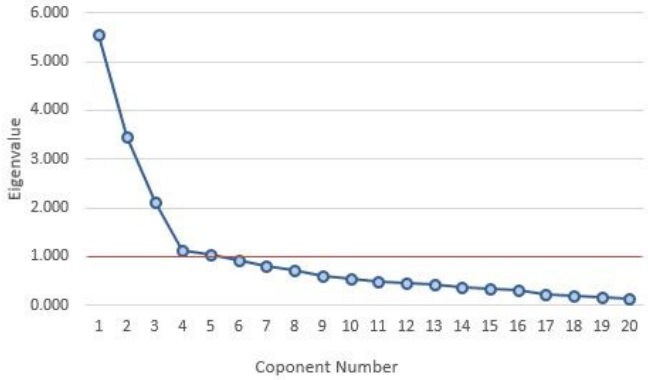
Source: Own research

Table 46 - *Exploratory Factor Analysis - Total Variance Explained - Five factors*

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.542	27.708	27.708	5.542	27.708	27.708	4.216	21.078	21.078
2	3.461	17.303	45.011	3.461	17.303	45.011	3.530	17.649	38.726
3	2.111	10.557	55.568	2.111	10.557	55.568	2.655	13.277	52.004
4	1.117	5.586	61.154	1.117	5.586	61.154	1.623	8.117	60.121
5	1.045	5.223	66.377	1.045	5.223	66.377	1.251	6.256	66.377
6	0.931	4.654	71.031						
7	0.798	3.989	75.019						
8	0.715	3.573	78.592						
9	0.617	3.085	81.677						
10	0.557	2.785	84.462						
11	0.481	2.407	86.869						
12	0.451	2.256	89.126						
13	0.425	2.124	91.250						
14	0.378	1.891	93.141						
15	0.346	1.728	94.869						
16	0.318	1.588	96.458						
17	0.221	1.103	97.561						
18	0.199	0.996	98.558						
19	0.159	0.796	99.354						
20	0.129	0.646	100.000						

Source: Own research

Figure 25 - *Exploratory Factor Analysis – Scree plot - Five factors*



Source: Own research

Table 47 - *Exploratory Factor Analysis - Component Matrix[a] – Five factors*

	Component				
	1	2	3	4	5
PS7	0.747				
PS8	0.743				
PS5	0.697				
PS3	0.673	-0.476			
PS4	0.666	-0.422			
T3	0.593	0.458			
T6	0.590				
T5	0.532	0.413			
T2	0.530	0.462			
PS1	0.495	-0.471			
T7	0.448		-0.423		
PS6	0.503	-0.548			
PS2		-0.481		0.413	0.460
T4		0.465			
C3	0.487		0.536		
C2		0.462	0.529		
C4	0.402		0.515		
C5	0.410		0.473		
C1			0.409	0.623	
T1				0.481	

a. 5 components extracted.

Source: Own research

Table 48 - *Exploratory Factor Analysis - Component Transformation Matrix – Five Factors*

Component	1	2	3	4	5
1	0.731	0.533	0.351	0.218	0.099
2	-0.556	0.584	0.429	-0.349	0.210
3	0.123	-0.599	0.757	-0.211	0.094
4	-0.186	-0.121	-0.006	0.565	0.795
5	-0.326	0.043	0.346	0.683	-0.553

Source: Own research

Three Factors

Table 49 - *Exploratory Factor Analysis - KMO and Bartlett's Test – Three factors*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.750
Bartlett's Test of Sphericity	**Approx. Chi-Square**	1359.512
	df	190
	Sig.	0.000

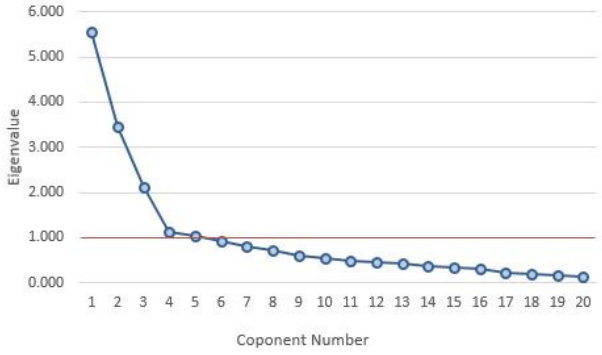
Source: Own research

Table 50 - *Exploratory Factor Analysis - Total Variance Explained - Tree factors*

Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	5.542	27.708	27.708	5.542	27.708	27.708	4.638	23.192	23.192
2	3.461	17.303	45.011	3.461	17.303	45.011	3.620	18.102	41.294
3	2.111	10.557	55.568	2.111	10.557	55.568	2.855	14.274	55.568
4	1.117	5.586	61.154						
5	1.045	5.223	66.377						
6	0.931	4.654	71.031						
7	0.798	3.989	75.019						
8	0.715	3.573	78.592						
9	0.617	3.085	81.677						
10	0.557	2.785	84.462						
11	0.481	2.407	86.869						
12	0.451	2.256	89.126						
13	0.425	2.124	91.250						
14	0.378	1.891	93.141						
15	0.346	1.728	94.869						
16	0.318	1.588	96.458						
17	0.221	1.103	97.561						
18	0.199	0.996	98.558						
19	0.159	0.796	99.354						
20	0.129	0.646	100.000						

Source: Own research

Figure 26 - *Exploratory Factor Analysis – Scree plot - Three factors*



Source: Own research

Table 51 - *Exploratory Factor Analysis - Component Matrix[a] – Tree factors*

	Component		
	1	2	3
PS7	0.747		
PS8	0.743		
PS5	0.697		
PS3	0.673	-0.476	
PS4	0.666	-0.422	
T3	0.593	0.458	
T6	0.590		
T5	0.532	0.413	
T2	0.530	0.462	
PS1	0.495	-0.471	
T7	0.448		-0.423
PS6	0.503	-0.548	
PS2		-0.481	
T4		0.465	
T1			
C3	0.487		0.536
C2		0.462	0.529
C4	0.402		0.515
C5	0.410		0.473
C1			0.409

a. 3 components extracted.

Source: Own research

Table 52 - *Exploratory Factor Analysis - Component Transformation Matrix – Tree Factors*

Component	1	2	3
1	0.753	0.549	0.363
2	-0.657	0.593	0.465
3	0.040	-0.589	0.807

Source: Own research

Appendix 8: Reliability analysis

Project management Satisfaction

Table 53 - *Reliability - Item Statistics - Project management satisfaction*

	Mean	Std. Deviation	N
PS1	4.32	0.637	139
PS2	3.91	0.850	139
PS3	4.29	0.631	139
PS4	4.29	0.631	139
PS5	4.27	0.687	139
PS6	3.89	0.857	139
PS7	4.25	0.649	139
PS8	4.24	0.677	139

Source: Own research

Table 54 - *Reliability - Scale Statistics* - Project *management satisfaction*

Mean	Variance	Std. Deviation	N of Items
33.46	17.685	4.205	8

Source: Own research

Time Management

Table 55 - *Reliability - Item Statistics - Time management*

	Mean	Std. Deviation	N
T1	4.54	0.542	139
T2	4.48	0.556	139
T3	4.41	0.536	139
T4	4.45	0.513	139
T5	4.45	0.580	139
T6	4.43	0.525	139
T7	4.47	0.515	139

Source: Own research

Table 56 - *Reliability - Item-Total Statistics - Time management*

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
T1	26.70	5.763	0.477	0.838
T2	26.76	5.259	0.678	0.807
T3	26.83	5.303	0.692	0.805
T4	26.79	5.717	0.537	0.829
T5	26.78	5.402	0.578	0.823
T6	26.81	5.448	0.642	0.813
T7	26.76	5.632	0.573	0.824

Source: Own research

Table 57 - *Reliability - Scale Statistics - Time management*

Mean	Variance	Std. Deviation	N of Items
31.24	7.298	2.702	7

Source: Own research

Cost Management

Table 58 - *Reliability - Item Statistics - Cost management*

	Mean	Std. Deviation	N
C1	4.55	0.513	139
C2	4.49	0.582	139
C3	4.55	0.541	139
C4	4.44	0.682	139
C5	4.52	0.556	139

Source: Own research

Table 59 - *Reliability - Scale Statistics* - Cost *management*

Mean	Variance	Std. Deviation	N of Items
22.55	4.379	2.093	5

Source: Own research

Appendix 9: Structural Equation Modelling - Measurement Model analysis

Table 60 - *Structural Equation Modelling - Measurement Model - Regression Weights - MM0*

			Estimate	S.E.	C.R.	P	Label
PS1	<---	Success	0.672	0.096	7.021	***	par_1
PS2	<---	Success	0.689	0.134	5.161	***	par_2
PS3	<---	Success	0.88	0.088	10.041	***	par_3
PS4	<---	Success	0.878	0.084	10.442	***	par_4
PS5	<---	Success	0.96	0.091	10.497	***	par_5
PS6	<---	Success	0.958	0.124	7.728	***	par_6
PS7	<---	Success	1				
PS8	<---	Success	0.999	0.085	11.82	***	par_7
T1	<---	Time	0.677	0.116	5.833	***	par_8
T2	<---	Time	0.984	0.117	8.415	***	par_9
T3	<---	Time	1				
T4	<---	Time	0.709	0.107	6.6	***	par_10
T5	<---	Time	0.938	0.123	7.653	***	par_11
T6	<---	Time	0.895	0.109	8.176	***	par_12
T7	<---	Time	0.729	0.113	6.439	***	par_13
C1	<---	Cost	0.41	0.103	3.966	***	par_14
C2	<---	Cost	0.799	0.134	5.943	***	par_15
C3	<---	Cost	0.747	0.128	5.847	***	par_16
C4	<---	Cost	1				
C5	<---	Cost	0.767	0.105	7.327	***	par_17

Source: Own research

Table 61 - *Structural Equation Modelling - Measurement Model - Correlations - MM0*

			Estimate
Success	<-->	Time	0.286
Success	<-->	Cost	0.241
Time	<-->	Cost	0.424

Source: Own research

Table 62 - *Structural Equation Modelling - Measurement Model - Regression Weights – MM1*

			Estimate	S.E.	C.R.	P	Label
PS1	<---	Success	0.636	0.094	6.78	***	par_1
PS2	<---	Success	0.596	0.131	4.556	***	par_2
PS3	<---	Success	0.85	0.085	9.941	***	par_3
PS4	<---	Success	0.861	0.081	10.584	***	par_4
PS5	<---	Success	0.945	0.088	10.683	***	par_5
PS6	<---	Success	0.898	0.121	7.436	***	par_6
PS7	<---	Success	1				
PS8	<---	Success	0.998	0.081	12.389	***	par_7
T1	<---	Time	0.677	0.116	5.835	***	par_8
T2	<---	Time	0.983	0.117	8.411	***	par_9
T3	<---	Time	1				
T4	<---	Time	0.709	0.107	6.6	***	par_10
T5	<---	Time	0.938	0.123	7.653	***	par_11
T6	<---	Time	0.895	0.109	8.179	***	par_12
T7	<---	Time	0.729	0.113	6.438	***	par_13
C1	<---	Cost	0.41	0.103	3.964	***	par_14
C2	<---	Cost	0.8	0.134	5.952	***	par_15
C3	<---	Cost	0.749	0.128	5.855	***	par_16
C4	<---	Cost	1				
C5	<---	Cost	0.767	0.105	7.322	***	par_17

Source: Own research

Table 63 - *Structural Equation Modelling - Measurement Model - Correlations – MM1*

			Estimate
Success	<-->	Time	0.29
Success	<-->	Cost	0.26
Time	<-->	Cost	0.424
e2	<-->	e6	0.633

Source: Own research

Table 64 - *Structural Equation Modelling - Measurement Model - Regression Weights – MM2*

			Estimate	S.E.	C.R.	P	Label
PS1	<---	Success	0.574	0.088	6.491	***	par_1
PS2	<---	Success	0.595	0.128	4.647	***	par_2
PS3	<---	Success	0.847	0.086	9.838	***	par_3
PS4	<---	Success	0.834	0.075	11.17	***	par_4
PS5	<---	Success	0.896	0.083	10.836	***	par_5
PS6	<---	Success	0.862	0.114	7.592	***	par_6
PS7	<---	Success	1				
PS8	<---	Success	0.948	0.076	12.484	***	par_7
T1	<---	Time	0.593	0.109	5.446	***	par_8
T2	<---	Time	0.845	0.11	7.654	***	par_9
T3	<---	Time	1				
T4	<---	Time	0.632	0.096	6.549	***	par_10
T5	<---	Time	0.805	0.116	6.963	***	par_11
T6	<---	Time	0.793	0.101	7.875	***	par_12
T7	<---	Time	0.533	0.107	4.986	***	par_13
C1	<---	Cost	0.476	0.111	4.29	***	par_14
C2	<---	Cost	1				
C3	<---	Cost	0.94	0.138	6.818	***	par_15
C4	<---	Cost	0.935	0.155	6.046	***	par_16
C5	<---	Cost	0.694	0.134	5.187	***	par_17

Source: Own research

Table 65 - *Structural Equation Modelling - Measurement Model - Correlations – MM2*

			Estimate
Success	<-->	Time	0.282
Success	<-->	Cost	0.274
Time	<-->	Cost	0.418
e2	<-->	e6	0.62
e19	<-->	e20	0.433
e14	<-->	e15	0.425
e12	<-->	e15	0.406
e10	<-->	e13	0.33
e3	<-->	e7	-0.373
e2	<-->	e7	-0.171
e1	<-->	e3	0.302
e1	<-->	e2	0.219

Source: Own research

Table 66 - *Structural Equation Modelling - Measurement Model - Regression Weights – MM3*

			Estimate	S.E.	C.R.	P	Label
PS1	<---	Success	0.557	0.09	6.212	***	par_1
PS2	<---	Success	0.535	0.128	4.163	***	par_2
PS3	<---	Success	0.841	0.086	9.765	***	par_3
PS4	<---	Success	0.829	0.074	11.167	***	par_4
PS5	<---	Success	0.896	0.082	10.934	***	par_5
PS6	<---	Success	0.855	0.113	7.572	***	par_6
PS7	<---	Success	1				
PS8	<---	Success	0.943	0.076	12.495	***	par_7
T1	<---	Time	0.616	0.12	5.119	***	par_8
T2	<---	Time	0.875	0.121	7.246	***	par_9
T3	<---	Time	1				
T4	<---	Time	0.591	0.101	5.819	***	par_10
T5	<---	Time	0.879	0.131	6.731	***	par_11
T6	<---	Time	0.863	0.114	7.585	***	par_12
T7	<---	Time	0.524	0.113	4.614	***	par_13
C1	<---	Cost	0.476	0.111	4.276	***	par_14
C2	<---	Cost	1				
C3	<---	Cost	0.946	0.139	6.832	***	par_15
C4	<---	Cost	0.936	0.155	6.049	***	par_16
C5	<---	Cost	0.697	0.134	5.212	***	par_17

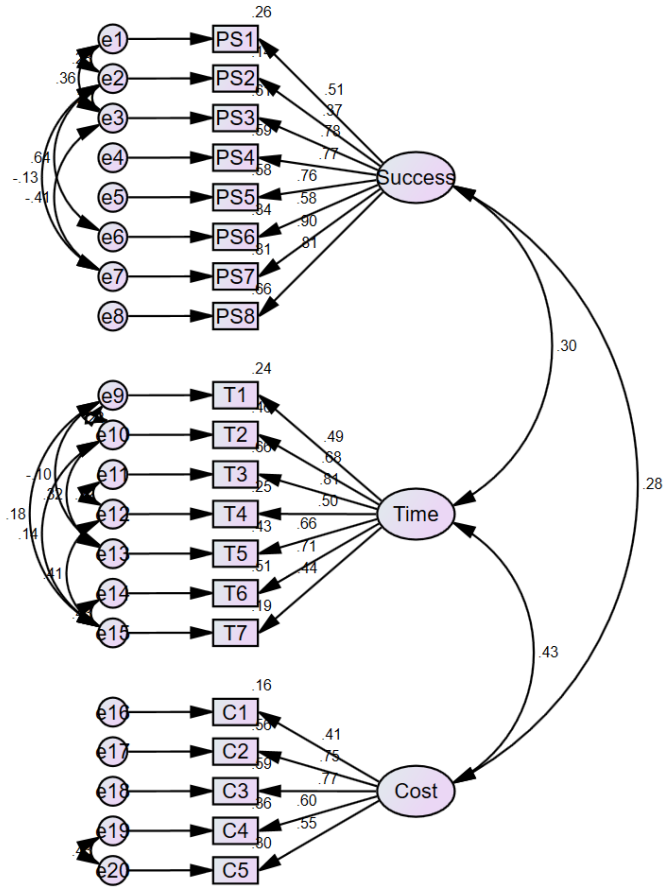
Source: Own research

Table 67 - *Structural Equation Modelling - Measurement Model - Correlations – MM3*

			Estimate
Success	<-->	Time	0.296
Success	<-->	Cost	0.281
Time	<-->	Cost	0.435
e2	<-->	e6	0.637
e19	<-->	e20	0.433
e14	<-->	e15	0.434
e12	<-->	e15	0.414
e10	<-->	e13	0.317
e3	<-->	e7	-0.415
e2	<-->	e7	-0.133
e1	<-->	e3	0.362
e1	<-->	e2	0.28
e11	<-->	e12	0.215
e10	<-->	e15	0.14
e9	<-->	e15	0.181
e9	<-->	e13	-0.101
e9	<-->	e10	0.223
e2	<-->	e3	0.197

Source: Own research

Figure 27 - *Structural Equation Modelling - Measurement Model – Standardised -MM3*



Source: Own research

Equation 4 - *Structural Equation Modelling - Measurement Model - Composite Reliability*

$$CR = \frac{\left(\sum_{i=1}^{i} \lambda_i\right)^2}{\left(\sum_{i=1}^{i} \lambda_i\right)^2 + \left(\sum_{i=1}^{i} 1 - \lambda_1^2\right)}$$

Equation 5 - *Structural Equation Modelling - Measurement Model - Average Variance Extracted*

$$AVE = \frac{\sum_{i=1}^{n} L_i^2}{n}$$

Table 68 - *Structural Equation Modelling - Measurement Model - Validity and Reliability - MM3*

	CR	AVE	MSV	MaxR(H)	Time	Success	Cost
Success	0.883	**0.499**	0.088	0.921	0.296	0.706	
Time	0.812	**0.392**	0.189	0.845	0.626		
Cost	0.757	**0.395**	0.189	0.796	0.435	0.281	0.628

Source: Own research

Table 69 - *Structural Equation Modelling - Measurement Model - Regression Weights - MM4*

			Estimate	S.E.	C.R.	P	Label
PS1	<---	Success	0.557	0.09	6.207	***	par_1
PS3	<---	Success	0.842	0.086	9.773	***	par_2
PS4	<---	Success	0.829	0.074	11.18	***	par_3
PS5	<---	Success	0.896	0.082	10.93	***	par_4
PS6	<---	Success	0.854	0.113	7.567	***	par_5
PS7	<---	Success	1				
PS8	<---	Success	0.943	0.075	12.49	***	par_6
T1	<---	Time	0.61	0.12	5.09	***	par_7
T2	<---	Time	0.874	0.12	7.256	***	par_8
T3	<---	Time	1				
T4	<---	Time	0.592	0.101	5.837	***	par_9
T5	<---	Time	0.878	0.13	6.741	***	par_10
T6	<---	Time	0.862	0.114	7.581	***	par_11
T7	<---	Time	0.519	0.113	4.585	***	par_12
C2	<---	Cost	0.973	0.149	6.519	***	par_13
C3	<---	Cost	1				
C4	<---	Cost	0.933	0.177	5.257	***	par_14
C5	<---	Cost	0.706	0.133	5.322	***	par_15

Source: Own research

Table 70 - *Structural Equation Modelling - Measurement Model - Correlations - MM4*

			Estimate
Success	<-->	Time	0.296
Success	<-->	Cost	0.315
Time	<-->	Cost	0.452
e19	<-->	e20	0.44
e14	<-->	e15	0.438
e12	<-->	e15	0.415
e10	<-->	e13	0.316
e3	<-->	e7	-0.419
e1	<-->	e3	0.362
e11	<-->	e12	0.21
e10	<-->	e15	0.143
e9	<-->	e15	0.182
e9	<-->	e13	-0.097
e9	<-->	e10	0.226

Source: Own research

Table 71 - *Structural Equation Modelling - Measurement Model - Validity and Reliability - MM4*

	CR	AVE	MSV	MaxR(H)	Time	Success	Cost
Time	0.812	**0.391**	0.204	0.845	0.625		
Success	0.893	0.550	0.099	0.920	0.296	0.742	
Cost	0.760	**0.447**	0.204	0.788	0.452	0.315	0.669

Source: Own research

Table 72 - *Structural Equation Modelling - Measurement Model - Regression Weights - MM5*

			Estimate	S.E.	C.R.	P	Label
PS1	<---	Success	0.557	0.09	6.209	***	par_1
PS3	<---	Success	0.842	0.086	9.772	***	par_2
PS4	<---	Success	0.829	0.074	11.18	***	par_3
PS5	<---	Success	0.896	0.082	10.93	***	par_4
PS6	<---	Success	0.854	0.113	7.567	***	par_5
PS7	<---	Success	1				
PS8	<---	Success	0.943	0.076	12.49	***	par_6
T1	<---	Time	0.612	0.12	5.098	***	par_7
T2	<---	Time	0.873	0.12	7.261	***	par_8
T3	<---	Time	1				
T4	<---	Time	0.589	0.102	5.777	***	par_9
T5	<---	Time	0.876	0.13	6.73	***	par_10
T6	<---	Time	0.863	0.114	7.588	***	par_11
C2	<---	Cost	1				
C3	<---	Cost	0.95	0.151	6.313	***	par_12
C4	<---	Cost	0.936	0.157	5.965	***	par_13

Source: Own research

Table 73 - *Structural Equation Modelling - Measurement Model - Correlations - MM5*

			Estimate
Success	<-->	Time	0.305
Success	<-->	Cost	0.297
Time	<-->	Cost	0.433
e10	<-->	e13	0.314
e3	<-->	e7	-0.418
e1	<-->	e3	0.362
e11	<-->	e12	0.22
e9	<-->	e13	-0.103
e9	<-->	e10	0.224

Source: Own research

Table 74 - *Structural Equation Modelling - Measurement Model - Validity and Reliability - MM5*

	CR	AVE	MSV	MaxR(H)	Time	Success	Cost
Time	0.811	0.424	0.187	0.839	0.651		
Success	0.893	0.551	0.093	0.920	0.305	0.742	
Cost	0.750	0.503	0.187	0.766	0.433	0.297	0.709

Source: Own research

Table 75 - *Structural Equation Modelling - Measurement Model - Regression Weights - MM6*

			Estimate	S.E.	C.R.	P	Label
PS1	<---	Success	0.557	0.09	6.21	***	par_1
PS3	<---	Success	0.842	0.086	9.772	***	par_2
PS4	<---	Success	0.83	0.074	11.18	***	par_3
PS5	<---	Success	0.896	0.082	10.93	***	par_4
PS6	<---	Success	0.854	0.113	7.566	***	par_5
PS7	<---	Success	1				
PS8	<---	Success	0.944	0.076	12.49	***	par_6
T2	<---	Time	0.863	0.121	7.148	***	par_7
T3	<---	Time	1				
T5	<---	Time	0.866	0.131	6.596	***	par_8
T6	<---	Time	0.855	0.116	7.362	***	par_9
C2	<---	Cost	1				
C3	<---	Cost	0.957	0.151	6.329	***	par_10
C4	<---	Cost	0.939	0.157	5.969	***	par_11

Source: Own research

Table 76 - *Structural Equation Modelling - Measurement Model - Correlations - MM6*

			Estimate
Success	<-->	Time	0.319
Success	<-->	Cost	0.299
Time	<-->	Cost	0.45
e10	<-->	e13	0.324
e3	<-->	e7	-0.416
e1	<-->	e3	0.362

Source: Own research

Table 77 - *Structural Equation Modelling - Measurement Model - Validity and Reliability - MM6*

	CR	AVE	MSV	MaxR(H)	Time	Success	Cost
Time	0.806	0.511	0.203	0.819	0.715		
Success	0.893	0.550	0.102	0.920	0.319	0.742	
Cost	0.750	0.502	0.203	0.766	0.450	0.299	0.709

Source: Own research

Appendix 10: Structural Equation Modelling - Structural Model analysis

Table 78 - *Structural Equation Modelling - Structural Model - Regression Weights - SM0*

			Estimate	S.E.	C.R.	P	Label
P_Success	<---	P_Time	0.312	0.15	2.072	0.04	par_12
P_Success	<---	P_Cost	0.216	0.16	1.363	0.17	par_13
PS1	<---	P_Success	0.639	0.09	6.823	***	par_1
PS3	<---	P_Success	0.855	0.09	10.01	***	par_2
PS4	<---	P_Success	0.865	0.08	10.6	***	par_3
PS5	<---	P_Success	0.948	0.09	10.68	***	par_4
PS6	<---	P_Success	0.901	0.12	7.425	***	par_5
PS7	<---	P_Success	1				
PS8	<---	P_Success	0.999	0.08	12.32	***	par_6
T6	<---	P_Time	0.833	0.12	6.781	***	par_7
T5	<---	P_Time	1				
T3	<---	P_Time	0.962	0.13	7.419	***	par_8
T2	<---	P_Time	0.985	0.12	8.145	***	par_9
C4	<---	P_Cost	0.934	0.16	5.964	***	par_10
C3	<---	P_Cost	0.95	0.15	6.297	***	par_11
C2	<---	P_Cost	1				

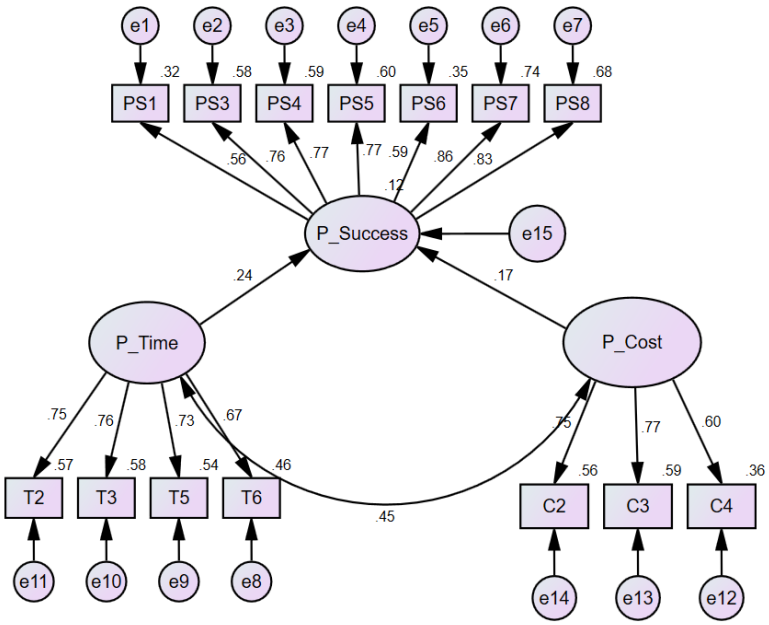
Source: Own research

Table 79 - *Structural Equation Modelling - Structural Model - Correlations - SM0*

			Estimate
P_Time	<-->	P_Cost	0.446

Source: Own research

Figure 28 - *Structural Equation Modelling - Structural Model - Standardised - SM0*



Source: Own research

Table 80 - *Structural Equation Modelling - Structural Model - Regression Weights - SM1*

			Estimate	S.E.	C.R.	P	Label
P_Success	<---	P_Time	0.31	0.15	2.027	0.04	par_12
P_Success	<---	P_Cost	0.262	0.17	1.58	0.11	par_13
PS1	<---	P_Success	0.557	0.09	6.21	***	par_1
PS3	<---	P_Success	0.842	0.09	9.772	***	par_2
PS4	<---	P_Success	0.83	0.07	11.18	***	par_3
PS5	<---	P_Success	0.896	0.08	10.93	***	par_4
PS6	<---	P_Success	0.854	0.11	7.566	***	par_5
PS7	<---	P_Success	1				
PS8	<---	P_Success	0.944	0.08	12.49	***	par_6
T6	<---	P_Time	0.855	0.12	7.362	***	par_7
T5	<---	P_Time	0.866	0.13	6.596	***	par_8
T3	<---	P_Time	1				
T2	<---	P_Time	0.863	0.12	7.148	***	par_9
C4	<---	P_Cost	0.939	0.16	5.969	***	par_10
C3	<---	P_Cost	0.957	0.15	6.329	***	par_11
C2	<---	P_Cost	1				

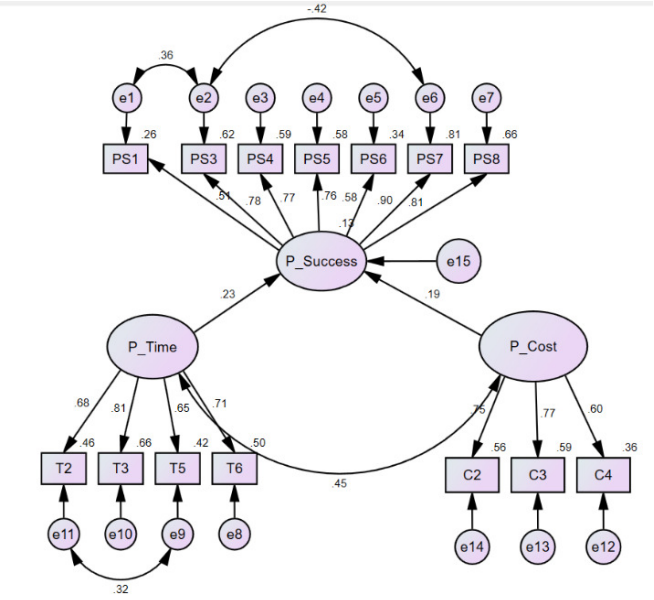
Source: Own research

Table 81 - *Structural Equation Modelling - Structural Model - Correlations - SM1*

			Estimate	S.E.	C.R.	P	Label
P_Time	<-->	P_Cost	0.085	0.02	3.704	***	par_14
e2	<-->	e6	-0.046	0.01	-3.304	***	par_15
e1	<-->	e2	0.077	0.02	3.246	0	par_16
e9	<-->	e11	0.058	0.02	2.684	0.01	par_17

Source: Own research

Figure 29 - *Structural Equation Modelling - Structural Model - Standardised - SM1*



Source: Own research

Appendix 11: Standard multiple regression analysis

Hypostasis 1 – Time management and Project Management Satisfaction (Success)

Table 82 - *Multiple regression - Descriptive Statistics -Time Management and Project Management Satisfaction (Success)*

	Mean	Std. Deviation	N
Success	4.409	0.565	139
Time	4.188	0.393	139

Source: Own research

Table 83 - *Multiple regression – Correlations -Time Management and Project Management Satisfaction (Success)*

		Success	Time
Pearson Correlation	Success	1.000	0.361
	Time	0.361	1.000
Sig. (1-tailed)	Success		0.000
	Time	0.000	
N	Success	139	139
	Time	139	139

Source: Own research

Table 84 - *Multiple regression - Coefficients[a] - Time Management and Project Management Satisfaction (Success)*

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	2.235	0.482		4.636	0.000	1.282	3.189		
	Time	0.519	0.115	0.361	4.528	0.000	0.292	0.746	1.000	1.000

a. Dependent Variable: Success

Source: Own research

Hypostasis 2 – Cost management and Project Management Satisfaction (Success)

Table 85 - *Multiple regression - Descriptive Statistics - Cost Management and Project Management Satisfaction (Success)*

	Mean	Std. Deviation	N
Success	4.409	0.565	139
Cost	3.959	0.383	139

Source: Own research

Table 86 - *Multiple regression - Correlations - Cost Management and Project Management Satisfaction (Success)*

		Success	Cost
Pearson Correlation	Success	1.000	0.346
	Cost	0.346	1.000
Sig. (1-tailed)	Success		0.000
	Cost	0.000	
N	Success	139	139
	Cost	139	139

Source: Own research

Table 87 - *Multiple regression - Coefficients[a] - Cost Management and Project Management Satisfaction (Success)*

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	2.391	0.470		5.086	0.000	1.462	3.321		
	Cost	0.510	0.118	0.346	4.312	0.000	0.276	0.744	1.000	1.000

a. Dependent Variable: Success

Source: Own research

Hypostasis 3 – Planning (Time and Cost management) and Project Success (Project Management Satisfaction)

Table 88 - *Multiple regression - Descriptive Statistics – Planning and Project Success*

	Mean	Std. Deviation	N
Success	4.409	0.565	139
Time	4.188	0.393	139
Cost	3.959	0.383	139

Source: Own research

Table 89 - *Multiple regression - Correlations - Planning and Project Success*

		Success	Time	Cost
Pearson Correlation	**Success**	1.000	0.361	0.346
	Time	0.361	1.000	0.539
	Cost	0.346	0.539	1.000
Sig. (1-tailed)	**Success**		0.000	0.000
	Time	0.000		0.000
	Cost	0.000	0.000	
N	**Success**	139	139	139
	Time	139	139	139
	Cost	139	139	139

Source: Own research

Table 90 - *Multiple regression - Coefficients[a] - Planning and Project Success*

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.684	0.533		3.161	0.002	0.630	2.737		
	Time	0.354	0.134	0.246	2.638	0.009	0.089	0.619	0.709	1.410
	Cost	0.314	0.137	0.213	2.288	0.024	0.043	0.586	0.709	1.410

a. Dependent Variable: Success

Source: Own research

Appendix 12: Consistency matrix

Table 91 - *Consistency matrix*

Hypotheses	Description	Literature Review	Data Collection Tool	Analysis
1	**$H1_0$:** There is no statistically significant positive relationship between time management and satisfaction of project manager (as project success). **$H1_A$:** There is a statistically significant positive relationship between time management and satisfaction of project manager (as project success).	Badewi, 2016. Grissom, Loeb, and Mitani, 2015.	Quantitative Surveys	Mahalanobis distance, Principal Component Analysis, Exploratory Factor Analysis, Confirmatory Factor Analysis, Correlation, Multiple regression analysis
2	**$H2_0$:** There is no statistically significant positive relationship between cost management and satisfaction of project manager (as project success). **$H2_A$:** There is a statistically significant positive relationship between cost management and satisfaction of project manager (as project success).	Badewi, 2016. Smith, 2014. Smith 2016. Chen, 2015.	Quantitative Surveys	Mahalanobis distance, Principal Component Analysis, Exploratory Factor Analysis, Confirmatory Factor Analysis, Correlation, Multiple regression analysis
3	**$H3_0$:** There is no positive statistical relationship between planning and success of project. **$H3_A$:** There is a positive statistical relationship between planning and success of project.	Badewi, 2016. Sanchez, Terlizzi, and De Moraes, 2017. Fonseca, Ramos, Rosa, Braga, and Sampaio, 2016.	Quantitative Surveys	Mahalanobis distance, Principal Component Analysis, Exploratory Factor Analysis, Confirmatory Factor Analysis, Correlation, Multiple regression analysis

Source: Own research

Appendix 13: Ethical Clearance Approval

Figure 30 - *Ethical Clearance Approval*

Gordon Institute of Business Science
University of Pretoria

14 August 2018

Shariatzadeh Sigaroudi Shahram

Dear Shariatzadeh Sigaroudi Shahram

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

You are therefore allowed to continue collecting your data.

Please note that approval is granted based on the methodology and research instruments provided in the application. If there is any deviation change or addition to the research method or tools, a supplementary application for approval must be obtained

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

Kind Regards

GIBS MBA Research Ethical Clearance Committee

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Source: Own research