A Critical Analysis of Quality Management Approaches in I.T. Projects in Ireland and the Relationship to Successful Project Implementation

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Abstract

Project Quality Management aims to ensure that the project will meet the requirements for which it was taken on. Balancing only scope, time and cost is not sufficient; to achieve ultimate satisfaction quality must be equally considered. The Project Management Institute (PMI) A Guide to the Project Management Body of Knowledge (PMBOK) sets standards for the project management profession which includes amongst its knowledge areas - Project Quality Management, which includes the processes required to ensure that the project will satisfy the needs for which it was undertaken.

The objective of this research was to evaluate in part the knowledge area ‘Project Quality Management’, particularly re the use of the Quality Management Plan (QMP) and Project Management Tools and Techniques (PMTT) for quality, and determine the impact on successful project implementation. Participants in this research evaluated their own use through a survey of the QMP and PMTT relating to project quality management.

The results of this research reveal that participants are aware that they are not doing sufficient quality planning and that there should be more widespread usage of the QMP. The quality toolset is one of the least used in project management. Though people use PMTT they tend to stick to familiar tools and techniques because these are the ones that are not just limited to quality planning but can also be used in a number of other knowledge areas.

Participants acknowledge that the use of a QMP and associated PMTT do have an influence on successful project implementation, in particular in the area of quality, meeting requirements, customer satisfaction and that the outcomes of the project were met.
1. Introduction

1.1 Background

Quality is important, especially in I.T. projects, particularly as everything has built-in software these days. We depend so much on technology in today’s world that it is imperative that we get it right. Technology is employed in phones and electronic equipment, food and goods manufacturing, even cars are run by technology. Sometimes it can be mission-critical type technology for medical devices, lifesaving equipment and aircraft navigational systems. Most companies nowadays are heavy users of technology and the customers expect high standards of quality in their dealings and transactions with systems.

Within Project Management there are three known constraints that are independent but interlinked. These are Time, Cost and Scope, and are represented in the project management triangle. Overarching all of these is Quality. Each of these elements influences and challenges project management. A successful project is about keeping a balance between the three constraints so that quality is not compromised. Quality is one of the key components of project success or failure. Quality and scope are frequently interchanged in the triangle.

Project Management literature often implies that quality is a fourth constraint to the traditional triangle. However Rose (2005) believes this thinking is erroneous as project managers will regularly make trade-offs between the triple constraints of scope, time and cost, but should “never, never, ever trade off quality during project implementation”.

The definition of quality per the International Organization for Standardization (ISO) is: "The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs". To simplify, it means that a product is considered of good quality when it meets with requirements specified by the client or end user, i.e. the requestor of the product (or service).
Project Quality Management aims to ensure that the project will meet the requirements for which it was taken on. A lot of I.T. projects fail as they only focus on meeting explicit requirements which have been documented and ignore implicit requirements that stakeholders and customers may expect but not state. In order to satisfy the stakeholders, sticking to balancing scope, time and cost is not sufficient; to achieve ultimate satisfaction quality must be equally considered.

The Project Management Institute (PMI) has published ‘A Guide to the Project Management Body of Knowledge’ (known as the PMBOK) to set standards for the project management profession. The fifth edition is the current version, and was published in December 2012, and launched 2013. Per PMI (2013) “it provides project managers with the fundamental practices needed to achieve organisational results and excellence in the practice of project management”. It includes amongst its knowledge areas - Project Quality Management, which includes the processes required to ensure that the project will satisfy the needs for which it was undertaken (PMI, 2013). PMI want to align their standards with ISO quality standards. They insist that all projects should have a Quality Management Plan and that compliance with the plan needs to be demonstrated by the project team.

Planning is essential for a project because a project is temporary and unique, with a definite beginning and end. Quality Planning is ascertaining which quality standards are applicable to a project and how to accomplish them. The execution processes include Quality Assurance which includes ongoing appraisal of the project performance to authenticate belief that the project satisfies quality standards. Controlling processes measure project performance to safeguard the plan from variances. Quality Control measures specific project attributes to ensure compliance with quality standards and to eradicate issues causing quality problems. Project Quality Management has to incorporate both managing the project and managing the product of the project. Failure to manage either can have critical negative outcomes.
The Standish Group (2013) has collected case information as to why I.T. projects succeed or fail. In their paper ‘The Chaos Report 2013’, they reveal that in 2012 61% of projects failed to deliver on time, on budget and within scope. Only 39% were successful. Of the 61%, 18% failed completely and were cancelled or never implemented, the others were eventually completed with challenges re delays, costs or scope.

Failed projects have cost billions of Euros and costs have shot through the roof as technology projects have increased in complexity. Many costly projects have been shelved before being implemented for various reasons. In literature review, there are hundreds of papers and books which address this topic in all areas of business, not restricted to one area.

The focus of research for this dissertation will be on the project management in Ireland across financial services area and information technology (I.T.). The reason the author is undertaking this research is because while working as a Project Manager in Dublin the researcher has a vested interest in why so many projects are not successfully implemented as seen first-hand. The purpose of the research is to analyse the Project Quality Management process used by the organisations doing projects in Dublin and the relationship to successful project implementation.

With the Project Quality Management process there is a Quality Management Plan, and there are several Project Management Tools and Techniques (PMTT) for quality planning and the analysis will be to see which ones are commonly used and which ones contribute towards successful project implementation.

1.2 Research Question

The research problem is both descriptive and relationship based. The key goals of the research will be to establish the following:

• Is there a relationship between the use of a Quality Management Plan and successful project implementation
• Does usage of the quality tools & techniques available make a difference in the overall quality of the project and influence the end outcome
1.3 Author’s Suitability to carry out this research

The MBA student has over twenty five years’ experience working on projects in financial services, IT and consulting, with sixteen of these at management level. The author holds an honours degree in Management Information Systems and is an ISEB Practitioner Certificate in Software Testing. During her time working in financial services and IT the researcher has worked in a variety of project roles such as a tester, test manager, business analyst, project manager and programme manager. During her career in testing she was instrumental in setting up a special interest group (SIG) to facilitate knowledge sharing within the Irish software testing industry.

1.4 Chapter Outline

*Chapter 1* introduces the dissertation and the background to it. It presents the research question and the motivation behind it.

*Chapter 2* covers the literature review relating to the subject area of the research question. The literature review will examine existing bodies of knowledge relating to the theories and viewpoints in the chosen area of research. It will expand on the author’s knowledge of key concepts in the field, and show where the research fits with existing studies.

*Chapter 3* is an outline of the research methodology and what methods will enable data collection to answer the research question. Prior to doing data collection the author will present the research philosophy and research strategy.

*Chapter 4* will reveal the data analysis and findings from the research. It will impart the discoveries without bias and present facts and figures as discovered. The results will highlight the significant findings relating to each area of investigation.

*Chapter 5* will discuss significant findings from the research, and will analyse this in conjunction with the outcomes from the literature review. This will be linked back to the research problem and the findings correlated to each field of exploration. The final section of this chapter will focus on a conclusion which should wrap all the ideas together and impart the importance of the research and ultimately conclude what was learnt from the exercise.
Chapter 6 will impart the reflections on learning which expresses the student’s own experience during the MBA course. This will be demonstrated in conjunction with key concepts and theories on learning, and how they coupled the student’s learning style, personality preferences and motivation.
2. Literature Review

2.1 Purpose of a Literature Review

When planning a research project there is a problem or issue that is being investigated for which we are looking for an answer. The literature research should contribute to the major concepts being defined and explained. The writing of the literature review should communicate to the reader which areas of knowledge are already recognised, and which areas are being examined. Caulley (1992) of La Trobe University states that the literature review should demonstrate how your research relates to previous studies and to the literature in general.

The purpose of the literature review is to demonstrate that the author has a good grasp of the particular topic, theories and concepts relating to the chosen topic of the research paper. It will help to define the problem and limit it. The literature review will comment on selected works and related studies and summarise, evaluate and clarify these. The review will also give a theoretical basis and set the scene for the research. It will help identify and articulate relationships between the literature and the subject of research.

The literature review will provide a context for and justify the research, and will illustrate where the author has learnt from previous theory on the topic. It will also highlight theory on the subject and how this relates to the current research. The review may also highlight flaws and gaps in previous research and add to the understanding and knowledge of the field. It should be an analysis and synthesis of any relevant publications which are linked to the area of research.

Hart (1998) says “a review of the literature is important because without it you will not acquire an understanding of your topic, of what has already been done on it, how it has been researched, and what the key issues are.” Therefore a good literature review is essential, as it critically evaluates what has been written, identifies issues and queries further areas for research.

Per Haywood and Wragg (1982) a literature review should indicate that the author has reviewed existing research in the subject area with insight and has critically evaluated this in relation to the research topic. Webster and Watson (2002) expand on this but expressing that this review helps advance knowledge and assists with theory development. The review should prepare the reader for the research that is to
ensue and give an indication of the work that has been carried out in the research subject area. It should also clarify the relationship of the research to the dissertation.

The author trusts that this literature review will contribute to the readers understanding of the Quality Management Plan (QMP) and the Project Management Tools and Techniques (PMTT) that are used for quality planning in the context of the PMI’s Project Management Body of Knowledge (PMBOK). The author hopes that the reader will gain a deeper understanding of the tools and techniques, and how often they are applied in practice and whether they contribute to successful project implementation.

2.2 PMBOK Project Quality Management

The PMI’s Project Management Body of Knowledge (PMBOK) document was first published in 1987 as a draft edition, and wasn’t formalised until the first edition in 1996. Nine knowledge areas were identified, including Quality Management. The word project was added to the knowledge areas and so Project Quality Management was born.

When ‘Project Quality Management’ was introduced the purpose of its inclusion was to encompass the processes essential for ensuring the project would fulfil the requirements for which it was undertaken. The original designations of the processes consisted of ‘Quality Planning’, ‘Quality Assurance’ and ‘Quality Control’, but these later evolved through the various editions to ‘Plan Quality Management’, ‘Perform Quality Assurance’ and ‘Perform Quality Control’ in the 2013 version.

![Previous PMBOK Revisions](image.png)

Figure 3 - Previous PMBOK Revisions – Image courtesy of PMI Washington DC Chapter
Project Quality Management includes all activities of project management that govern the quality practices, accountabilities and quality objectives, of the project. These are applied through the processes of quality planning, quality assurance and quality control in the context of the organisational quality management system. Project Quality Management also promotes ongoing process improvement. Munier (2013) maintains that quality begins with project inception, and develops under the guidance of a good project management team.

Quality planning is done through the process of ‘Plan Quality Management’ which is concerned with ascertaining project quality requirements and detailing how the project will deliver those specific to the particular project. The value of this process is that it is central to providing governance and control on the management of quality throughout the project. It allows quality to be engineered into the project before work even starts. Quality planning also involves identifying standards and best practices.

There are various inputs to the process of ‘Plan Quality Management’ which includes the project management plan containing the scope baseline which consists of the project scope statement, the work breakdown structure (WBS) and the WBS dictionary. The project management plan also includes the schedule baseline, the cost baseline and any other management plans which feed in. Inputs also includes the Stakeholder register, the Risk register, any requirements documentation, enterprise environment factors like government regulations and organisational process assets such as the organisational quality policy.

2.3 Evolution of Plan Quality Management Tools & Techniques

Plan Quality Management tools and techniques are critical to the success of the planning quality process. The process requires a combination of these tools and techniques. The classification of each as either a tool or a technique is dependent on a) if it provides an aid or method for a specific purpose in accomplishing a task then in that case it is a tool, or b) if it is more of a specific systematic approach to efficiently accomplish a task then it is a technique. They can be interchangeable. PMI has constantly reviewed these to ensure that they are current with project management practices. Kettinger (1997) outlines his definitions of tools and techniques. A technique is a set of precise procedure or a set of specific steps for accomplishing a standard task and achieving a desired outcome, whereas a tool refers to an instrument or certain tangible aids to performing a task.
In the first edition of the PMBOK guide (1996) Project Management ‘Tools & Techniques’ (PMTT) for plan quality management included benefit/cost analysis, benchmarking, design of experiments (DOE), and flowcharting. Cost of Quality (COQ) was added in the 2000 edition.

The PMTT were revised again in the 2004 edition whereby the ‘Additional Quality Planning Tools’ was inserted which included brainstorming, affinity diagrams, force field analysis, nominal group techniques, matrix diagrams, and prioritisation matrices. Flowcharting was moved to this grouping just in this edition (2004) but later restored as a standalone technique in the 2008 version. Benefit/cost analysis was just renamed to cost-benefit analysis.

PMBOK Guide Fourth edition (2008) saw the addition of control charts, statistical sampling, proprietary quality management methodologies (e.g. Six Sigma, Lean, CMMI, etc) and additional quality planning tools (brainstorming, affinity diagrams, force field analysis and nominal group techniques). Affinity diagrams were later moved to Perform Quality Assurance tools in 2013.

PMBOK Guide Fifth edition (2013) saw the refinement of these PMTT again (see figure 5). The original and staples of cost-benefit analysis, cost of quality, benchmarking and design of experiments remained constant. Statistical sampling remained from its introduction in 2008, references to proprietary quality management methodologies were removed completely and ‘Meetings’ was added as a new tool and
technique. The 2013 edition also saw the introduction of the ‘Seven basic quality tools’ - Cause & Effect Diagram, Flowcharts, Checksheets, Pareto Diagrams, Histograms, Control Charts, and Scatter Diagrams.

![Figure 5 - Plan Quality Management (PMBOK, 2013)](image)

### 2.4 Project Management Tools & Techniques (PMTT)

Project Quality Management studies indicate that correct usage of PMTT impacts the success of a project. The questions that the researcher was seeking answers for in the literature review were what are the appropriate tools and techniques to use that will lead to better project performance and when should such tools and techniques be used in a project.

In the literature review project management tools and techniques (PMTT) are presented in the context of the Project Management Body of Knowledge (PMBOK) published by the Project Management Institute (PMI). The focus was on the Project Quality Management knowledge area. A lot of textbooks based on PMBOK contemplate on various PMTT and how these can be used for quality project deliverables and to what benefit.

There are many PMTT available to tackle the challenges relating to the three constraints of cost, time and scope. A good Project Manager will use appropriate tools in order to execute the project successfully. The PMBOK presents a standard set of guidelines and practices for governance of projects.

Patanakul et al (2010) undertook empirical research to investigate links between project management tools and techniques (PMTT) and success of a project, and concluded that using PMTT during some of the phases of a project does indeed contribute to success. Although they couldn’t define project success in their research they concurred with popular views from literature that success is categorised into internal, customer-related and organisational success factors. Internal success factors are related to the
project management triangle of cost, time and scope. Customer-related success factors are dependent on the customer satisfaction, benefit to the customer and successful adoption of the product/service. The organisational success factors are related to general financial implications, market based and overall benefit to the company.

The relationship between quality management and project management was examined by Orwig & Brennan (2000) and suggests that employing quality management principles appropriately can provide valuable insight to project management. They believe that they should be inextricably integrated in practice.

Besner & Hobbs (2012) had a detailed look at PMTT and how these are used in practice in projects. The toolset for Quality Management included only four of the PMBOK recommended PMTT (Inspections, Control charts, Cause and Effect diagram and Pareto diagram), however their results show that the average use of this toolset is the third lowest in reality.

Laszlo (2003) believes it is feasible to apply an approach based on quality management to project management. Laszlo recommends a quality management approach whereby key processes are identified by the Project Manager (PM) and broken down. This allows the PM to quality control each process individually rather than try to manage quality for the project as a whole. By breaking down processes, and inputs/outputs, customer requirements can be incorporated into the solution, and appropriate PMTT applied.

2.4.1. Cost-benefit analysis

Cost-benefit analysis (CBA) introduced in PMBOK 1996 is a tool for estimating the economic advantages and disadvantages of an investment decision by considering its costs and benefits in order to evaluate the prosperity change accredited to it. Roosen (2012) believes that CBA “is rooted in the ethics of utilitarianism: things are of value because they are valued by humans in their pursuit of happiness and well-being”. In projects CBA allows for the methodical deliberation of all effects of a project in monetary terms. It is based on defined project objectives, which are given a fiscal value for both the tangible benefits and the project costs (Roosen, 2012). This is then discounted and costed to calculate a net total benefit. It will also include key financial metrics such as Return on Investment (ROI), Internal Rate of Return (IRR) and Net Present Value (NPV). This assessment tool can be quite subjective as the calculations are dependent on the supporting data and estimates. It has been submitted that many
senior managers are poor at measuring the contribution of projects, and it has been suggested that in many cases that figures are often a work of fiction (Grindly, 1991, cited in Willcocks, 2013, p. 10).

2.4.2. Cost of Quality

The cost of quality (COQ) was first introduced by Joseph M. Juran (1951) in his ‘Quality Control Handbook’ and brought into PMBOK in 2000. Juran defined the cost of quality as both tangible and intangible costs. His theories covered quality planning, quality control, and quality improvement. The term cost of quality (COQ) refers to the associated expense of providing poor quality or service if it is not done right the first time. The cost of rectifying something once a project has been implemented is typically five times more expensive than if done during the project. What Juran proposed was that costs for a project should be measured and analysed for both conformance and non-conformance in the areas of prevention costs, appraisal costs and failure costs. Team FME (2014) points out that non-conformance “used to be called the cost of poor quality”.

Prevention cost includes the cost of actions required to do it right first time, quality planning, quality assessment, quality and product reviews, education and training, and process improvement enactment, to ensure conformance to quality requirements. Appraisal cost covers budget spent on inspections, quality audits and testing to ascertain the level of quality conformance. Failure costs are the internal (found by the project) and external (found by the customer) costs associated with scrapped products, customer complaints/returns, rework, corrective actions and loss of business.

Rose (2005) states that “quality does not cost, it pays” simply by improving the quality the payback can be more than the cost. Cost of quality builds awareness of the importance of quality and has become a key component of quality management planning.

2.4.3. Seven Basic Quality Tools

The Seven Basic Quality Tools introduced to PMBOK 2013 originated with Kaoru Ishikawa (1968) as the ‘7 tools for Quality Control’ (7QC) allegedly named after the seven tools of the legendary Japanese warrior Benkei, who used these tools to win all his battles. These graphical techniques are acknowledged as being most useful in troubleshooting quality-related issues. The ‘Seven basic quality tools’ are Cause & Effect Diagram, Flowcharts, Checksheets, Pareto Diagrams, Histograms, Control Charts, and Scatter Diagrams.
They are called basic because they are easy to understand so suitable for people without formal training in statistics. The benefits include being able to identify problems or challenges, better analysis, controlling project quality, and improving performance over time by monitoring and controlling variation in quality. Ishikawa (1985, p.198) is quoted as saying “as much as ninety-five percent of all problems within a company can be solved by means of these tools”.

2.4.3.1. Cause & Effect Diagram

There are a number of terms for this as it is also known as fishbone diagrams, Ishikawa diagrams or herringbone diagrams. These causal diagrams were introduced by Kaoru Ishikawa in his Guide to Quality Control (1968). These diagramming techniques such as the fishbone diagram (see figure 6) helps identify and graphically represent any possible causes related to a problem or condition (Brassard & Ritter, 1994, p. 23). They are used frequently for prevention of quality defects in product design. The project team decide on a problem statement and then brainstorm. The cause and effects of potential issues are analysed and categorised. These categories include manpower (people), methods (procedures), machines (equipment or technology), materials, and measurement (data). Tague (2005) offers that the fishbone diagram can help sort ideas about the many causes for an effect or problem.

2.4.3.2. Flowcharts

The flowchart (see figure 7) or flow diagram or process maps are used to demonstrate the actual flow or sequence of events in a process that any product or service follows (Brassard & Ritter, 1994, p. 56). This can be any process such as a service process, a production process or an administrative process. It is done during a project to develop an understanding of how a process is performed, documents that process, and looks for opportunity for improvement. It is an easier method of communicating that process in a pictographic representation. Brajer-Marczak (2012) suggested
that the quality of products and services is in direct relation to the quality level of the underlying process mapping that occurred. Madu (2012) indicated that the process flow diagram is the most powerful of the basic quality tools. Sterneckert (2003) describes different types of flowcharts that can be used for documents, data and systems.

### 2.4.3.3 Checksheets

A checksheet (see figure 8) is a fabricated form which is structured to collect and analyse information. It is custom-designed to capture data in a format that suits the user, and enables easy interpretation of results. It is used for a variety of purposes but usually when systematically collecting data repeatedly over a frequent observed pattern of events such as defects, issues or timings. (Brassard & Ritter, 1994, p. 31). It is usually made up of rows and columns, allowing data to be organised in a way that permits easy totalling and summation of results. “Check sheets are an effective way to organize information, determine the causes of a problem and solve it” (Bothe, 2001).

### 2.4.3.4 Pareto Diagrams

A Pareto diagram or chart (see figure 9) is a histogram used to show the breakdown of key problems or issues within a process. This highlights key problems so that efforts can then be focussed on those issues with best possibility for potential improvements (Brassard & Ritter, 1994, p. 95). It is based on the Pareto principle (80-20 rule) propounded by Juran (1999) where it is believed that 80% of project difficulties are caused by 20% of the problems, or being able to generate 80% of the benefit by doing 20% of the work. It is a bar chart with the results appearing in order of importance from left to right, allowing one to clearly see at a glance the critical significant issues. The Pareto diagram orders the causes of the errors in a product and shows which
aspects have the greatest impact on overall quality (Hart, 1989). It is an excellent communication tool for projects.

2.4.3.5. Histograms

A histogram (see figure 10) is used to summarise data collected over a time period and then graphically represent it in tabulated form in a chart (Brassard & Ritter, 1994, p. 65-66). The histogram is used for frequency distributions, which shows how often different values in a set of data occur. It is similar to a bar chart, but there are important differences between them. The histogram is used when data is numerical, and to see the distribution of the data to estimate if it has a normal distribution (Tague, 2005).

2.4.3.6. Control Charts

Control charts (see figure 11) or run charts are used to monitor, control and improve process performance over time by studying variation and its source. They assist in helping to show any process variance over time and when carried out correctly and continually they can help improve any process so that it can perform consistently by which a higher quality, lower cost, and higher effective capacity is achieved (Brassard & Ritter, 1994, p. 36). Data is plotted in order of time with upper and lower lines for control limits, and a central line for the average. This helps draw conclusions on whether the process is in control or out of control, through variation analysis (Tague, 2005). The control chart provides an understandable representation of what is happening in a process over time and as Goetsch and Davis (2014) mention “it causes trends to jump out at you” therefore also known as a trend chart.
2.4.3.7. Scatter Diagrams

Scatter diagrams (see figure 12) are used to study or identify the relationship between two variables (Brassard & Ritter, 1994, p. 145). By providing the data it confirms a theory that two variables are related and shows this visually in the scatter diagram graph. It works for paired numerical data, and determining a root cause of problems. The data is plotted in numerical pairs on each axis (X, Y) and if correlated the points will form along a curve. The better the correlation, the closer the points will be to the curve. (Tague, 2005). It is then possible to surmise that a cause and effect relationship occurs, and allows for the causal variable to be remedied. (Hart and Hart, 1989). A scatter diagram can be used as part of a control system to ensure that realisations from quality improvement efforts are maintained.

2.4.4. Benchmarking

Benchmarking exists as a PMBOK tool since 1996. It is fundamental for effective project management, whether it is for measurement of a specific project’s success or whether it is comparing its project delivery capability to that of a competitor. When planning project quality, it is practical to look at best in class or best outcomes from other projects, maybe from lessons learnt, and use those as a target. Per Zink (2012) the word benchmark originates in the comparison with others in the context of the best performance in a particular area. Zink quotes Chinese General Sun Tzu “If you know your enemies and know yourself, you will not be imperilled in a hundred battles” (Sun Tzu, The Art of War, translated by Giles, 2007, p.62).

Benchmarking can help identify the strengths and weaknesses of the company’s project practices and can be used to determine project performance. Regular benchmarking of projects and project methodology can assist the organisation understand if performance improves over time. (Ibbs, 2002). Increasing numbers of quality managers have incorporated benchmarking for quality improvement and it is emerging as an integral tool to achieve business objectives (Madu, 2012). “Benefits of benchmarking include reduced cost, higher productivity, improved customer service, quality and competitiveness” (Zwikael & Globerson, 2007).
2.4.5. Design of Experiments

Design of experiments (DOE) is an effective quality planning technique used for inspecting new processes, acquiring enhanced knowledge of existing processes and optimising these processes for achieving top notch performance. It’s been listed in PMBOK since 1996.

Design of experiments achieves inventive improvements in product quality and process efficiency (Anthony, 2014). DOE involves working with multiple variables to investigate the best probable combination. Awareness of which variables affect results is a very important part of quality planning (Schwalbe, 2013). Schwalbe also quotes the work of Taguchi whose key concept is that “quality should be designed into the product, not inspected into it, and that quality is best achieved by minimizing deviation from the target value” (Schwalbe, 2013). DOE is commonly used during the creation of the Quality Management Plan to decide which tests and how many are required which would impact on the cost of quality. For planning purposes it is necessary to recognise the importance of the experimentation for a project, the time and budget for the experiment, what resources will be required and what responsibilities will be assigned. DOE can be used to decrease design costs by speeding up the process, reducing last-minute design changes, and lessening material and labour complexity. Statistical design of experiments is when it is planned so that data collected can be statistically analysed (Montgomery, 2009).

2.4.6. Statistical Sampling

Statistical sampling was instigated in 2008 into PMBOK and is an analytical technique in project quality management. A complete set or collection of items of interest is called a population, and a sample is a subset of items taken from the overall population for inspection. It involves picking that subset for study because it is impractical to attempt to study the full population. Schwalb (2011) commented that sampling helps establish a realistic number to include in analysing a population. Ryan (2011) made the observation that statistical techniques are beneficial for identifying problems and their causes, as well as forecasting issues before they happen. Evans and Lindsay (2012) expand on this through ‘predictive statistics’ which uses historical data to develop predictions of future value. Practical planning of statistical sampling for the Quality Management Plan will ensure the cost of quality accurately reflects this activity.
2.4.7. Additional Quality Planning Tools

There are many other tools that can be used in the plan quality process to define quality requirement. Originally launched in 2004, the current subgroup of additional tools in the 2013 PMBOK include brainstorming, force field analysis, nominal group technique, and quality management and control tools.

2.4.7.1. Brainstorming

This is a technique by which a project team will group together to quickly generate ideas in either a free-form (unstructured) session or a structured session under the leadership of a facilitator. Brainstorming allows a team to creatively and efficiently generate numerous ideas in an open, involved and enthusiastic way (Brassard & Ritter, 1994, p. 23). Group members are invited to offer their ideas without prejudice and outside the box thinking is encouraged. Sometimes the sessions should be focussed on a particular issue and the purpose will be to solve it. It is also used for initial project planning to attempt to capture all the tasks required, or for gathering risks for the project (Schwalb, 2012).

2.4.7.2 Force field analysis

Force field analysis is a functional decision-making technique which analyses the forces for and against the resolution for a change, or an issue or a problem. Force field analysis determines the forces and factors, both positives and negatives of a situation, that support or work against the solution of an issue or problem. This analysis allows elimination of the negatives and reinforcement of the positives, and impels the team to think about the comparative priority of each aspect (Brassard & Ritter, 1994, p. 63).

Force field analysis was originally presented by Kurt Lewin in 1951 (cited in Cronshaw and McCulloch, 2008) to use as a diagnostic tool during the planning process. It assesses the conditions prevailing in the environment at a given point in time. Cronshaw and McCulloch believe that Lewin theories originate in dynamic physics and specifically for analysing the forces for and against a change. It can be utilised for a couple of reasons – 1) to decide to proceed with the change or 2) to increase possibility of success to strengthen forces for change and to weaken those opposed to it. Kettinger et al (1997) suggest force field analysis can be used in business process engineering projects to assist the project team identify forces resisting the implementation of a new process. Grundy (1998) says that force field analysis appeals because it is essentially the same variable but seen from opposing sides positive and negative.
2.4.7.3 Nominal group technique

Nominal group technique (NGT) is a variation of brainstorming which is focussed on idea generating in a small group but as individuals. Participants respond in writing to questions posed by a facilitator and individually rank answers. NGT allows a team to reach a consensus very quickly on issues, problems or solution by grouping the individual responses into a final team priority list (Brassard & Ritter, 1994, p. 91). The advantage is that everyone gets to partake and the process is not dominated by any individuals. Bin Abdullah and Rafikul (2011) observe that NGT is particularly useful for generating ideas in groups that don’t usually interact, groups where tension exists, or where variation in rank could prohibit open and candid discussion. It is also useful for overcoming individual loyalties due to its anonymity.

2.4.7.4 Quality management and control tools

In addition to the aforementioned project management tools and techniques (PMTT) additional quality management tools are used to connect and categorise identified activities (PMBOK, 2013). They include affinity diagrams, process decisions program charts (PDPC), interrelationship digraphs (ID), tree diagrams, prioritisation matrices, activity network diagrams (AND) and matrix diagrams. The PMTT are used also in the perform quality assurance process. Explanations derived from Brassard & Ritter (1994).

<table>
<thead>
<tr>
<th>Tools &amp; Techniques</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affinity Diagrams (p.12)</td>
<td>Gathering ideas from brainstorming, analyse and sort into related logical groupings</td>
</tr>
<tr>
<td>Process Decisions Program Charts (p.160)</td>
<td>Based on the tree diagram it is useful for plotting proposed implementation steps and contingencies</td>
</tr>
<tr>
<td>Interrelationship Digraphs (p.76)</td>
<td>Analytically classify cause and effect relationships of issues and identify drivers and outcomes</td>
</tr>
<tr>
<td>Tree Diagrams (p.156)</td>
<td>Used to map the tasks for a project by breaking them down graphically into incremental levels of detail</td>
</tr>
<tr>
<td>Prioritisation Matrices (p.105)</td>
<td>A comparative technique that narrow options by methodical selection, weighting and application of selection criteria</td>
</tr>
<tr>
<td>Activity Network Diagrams (p.3)</td>
<td>Plotting the project activities in the required sequence, and simultaneous activities, to show graphically the critical tasks to monitor on the path to completion</td>
</tr>
<tr>
<td>Matrix Diagram (p.85)</td>
<td>Used to systematically analyse and plot relationships between sets of variable information</td>
</tr>
</tbody>
</table>
2.4.8. Meetings

“Project team or group meetings are the modern version of a committee” (AMA, 2008). The project team exists for the purpose and length of the projects, and consists of people from various parts of the organisation. Meetings were introduced in PMBOK 2013 in order that the project team conduct meetings to develop the quality management plan. These meetings are attended by the project sponsor, project manager, and other team members that are responsible for quality of the project. Kerzner (2013) favours using a facilitator to guide the meeting as this helps project team members understand their shared objectives and how to achieve them. The goal of planning quality will be challenging as the team involved may take time to develop their own group dynamics, and the project manager may not have supervisory authority over the team. Thayer-Hart (2007) says that the art of planning and conducting meetings that meet their objectives is a worthy leadership skill.

2.5 Quality Management Plan (QMP)

Throughout the project quality needs to be built in. All the project processes and deliverables should adhere to specific quality standards, either organisational quality policies or industry standards such as International Organization for Standardization (ISO) 9000. PMBOK methodology regarding project quality management is expected to be consistent with ISO quality standards (PMBOK 2013, p228). ISO 9000-series is a group of international standards relating to quality management. Quality as defined by ISO 9000:2005 is “the degree to which a set of inherent characteristics fulfil requirements”. Per PMBOK all projects should have a quality management plan, and the project team should adhere to that plan with evidence to validate that compliance. Rose (2005) noted that “a quality project and product will yield customer satisfaction.”

As part of the project there will be numerous deliverables which should have specific customer requirements and be held to a certain quality standard. Before delivery to the end user/customer each of these deliverables needs to be verified and validated. The purpose of the Quality Management Plan (QMP) is to ensure that there is a strategy from start to end of the project that ensures that this happens. It is plausible that if the production processes and activities for these deliverables do not follow quality standards then it is highly likely that the output (the deliverable) will not be of high quality
Work processes should be documented and performed efficiently, and the product should meet agreed standards. Any deviations should be identified and rectified.

Munns and Bjeirmi (1996) believe that quality is ultimately satisfying the needs of the user and that project success for the user will be the ability to use the end product, oblivious to the quality management processes that have been employed.

The quality management plan which is produced by the project manager, and the project team, in conjunction with the customer, should include quality standards, quality assurance and quality control mechanisms for the project. It should include the acceptable level of quality as agreed with the customer and set quality expectations. This document will act as the quality ‘bible’ for the duration of the project and the project team and stakeholders will abide by the guidelines laid out.

Globerson and Zwickael (2002) emphasise that the quality planning is critical to the success of the project. Their study concluded that some project managers are not that experienced in the area of quality planning and need more training on tools and techniques which can support this process.

Quality tools and techniques have been improved and advanced over the past century to the point where they have become a science. Utilising these tools to plan quality should be an easy task but unfortunately the quality management categorised tools are not applicable to every type of project and may be more relevant to manufacturing type projects (Rose, 2005).

2.5.1. Quality Management Plan Components

The Quality Management Plan (see figure 13) identifies and describes the following elements – quality objectives pertaining to customer expectations, quality standards and guidelines, organisational policy, quality tools, quality control and quality assurance activities, and the mechanisms for reporting progress and issues on these activities (PMBOK, 2013). It includes the important project deliverables and project processes that should be reviewed for acceptable quality level. Other things that are likely to be included are quality roles and responsibilities, stakeholders with an interest in quality, and any risks or issues that may impact quality requirements. Best practice could include lessons learnt on quality planning from previous projects.
Rose (2005) states that many project managers who are unfamiliar with quality planning seek out quality management plan templates to start with, however Rose’s opinion is that this is elusive as most references are academic in literature about project management rather than any real world examples. The author found this also to be the case, as there were very few periodicals or journals with reference to quality management plans.

2.5.1.1. Quality Management Objectives

The purpose for managing quality is to validate that the project deliverables are completed with an acceptable level of quality. Ogunbiyi and Oginni (2014) indicate that a quality management plan (QMP) is a framework to direct the project with regard to the quality of a product, and that its purpose is to balance quality of deliverables against the quality of the project. Quality management assures the quality of the project deliverables and the quality of the processes used to manage and create the deliverables. Quality Management is dependent on specific objectives in order to be effective (Cochran, 2000). The quality goals and objectives provide a broad expectation of what is to be accomplished. The quality objectives should include statements in terms of the plan for quality, for example to prove that deliverables meet the requirements of the customer, that deliverables are user friendly, or that project processes conform to industry best practice or the organisational quality policies. Kerzner (2013) argues that project managers may not be able to determine quality objectives without assistance from the project sponsor who will input the business aspect to quality.

2.5.1.2. Quality Standards

The project quality management plan should include the standards that will be utilised to measure the quality of deliverables. This can be an organisational defined quality policy if it exists. If not, then an industry quality standard such as ISO 9000, Total Quality Management (TQM), Six Sigma or Continuous
Process Improvement (CPI) to name but a few methodologies. Even if there is an existing organisational quality standard then the specific needs of the project may require something additional (Rose, 2005).

2.5.1.3. Quality Control and Quality Assurance

As part of the quality management plan all activities relating to quality control and quality assurance should be acknowledged. The key project deliverables that will be reviewed should be catalogued and the associated quality control activities that will verify that they are of acceptable quality defined. The schedule and occurrences of quality control activities should be established. Roles and responsibilities and any assigned resources to quality should be identified. Kerzner (2013) considers that companies that have teams who fully understand their roles in the quality planning process have more successful projects. Kerzner stresses that it is key to establish good working relationships with the line managers of the quality resources and ensure they have the ability to report both vertically to their line manager and horizontally to the project manager. Any quality related tools to be used should be identified and their purpose outlined. Details of the tools have been covered extensively elsewhere in this paper.

2.5.1.4. Quality Reporting

Mechanisms for reporting on issues from the quality control or quality assurance activities should be defined. Project team members and stakeholders with an interest in quality should be included in the report distribution. ISO (2005) states that products made through quality control processes benefits the customer as they usually have a seal of approval or adhere to a certain standard. It also benefits the organisation as quality control means that the company will adopt better processes. Lester et al (1992) maintain that the ultimate benefits of control quality are defect prevention, improved product, lower costs and great customer satisfaction.

2.5.1.5. Quality Risks & Issues

The quality management plan (QMP) should also list any risks or issues that may impact quality requirements. The project risk management process is covered in detail in its own PMBOK knowledge area which covers risk management plan, identification, analysis, response planning, and risk control. However it is prudent to include any specific risks to quality in the QMP. Pritchard (2014) suggests that a good place to start looking for a technical risk is the work breakdown structure (WBS) as the risk analysis could include who is doing what and how they are doing it. Any risky processes can be singled out.
This is also where some of the quality tools and techniques can be utilised to identify risks and issues. Pritchard (2014) says that ‘Brainstorming’ is most frequently used as a starting point. Kendrick (2015) advises focussing on potential defect areas such as hardware, software, and integration points and ensuring that appropriate tests are designed (DOE). It is also useful per Kendrick to use the Cause and Effect diagram to examine potential risks and issues relating to particular areas.

2.5.1.6. Quality Planning Lessons Learnt

Regarding lessons learnt on quality planning from previous projects. Ogunbiyi and Oginni (2014) maintain that whatever goes wrong in one project probably will occur in another project. Therefore projects should learn from history and correct the root cause in a process of continuous improvement. It may be possible to develop a checklist that can be used based on past experience in quality planning.

2.5.2. Summary

The quality management plan is dependent on getting a commitment to a quality policy from the project management organisation and the client. The quality management plan then needs to be monitored throughout the project to ensure its success, and that it is effective in its contribution to a successful project implementation.

2.6 Project Success Conception

Project success is commonly judged by delivery on time, in budget, and to a specified scope/quality. This is considered somewhat inadequate, so studies attempt to overcome perceived limitations to add more dimensions to the basic criteria. In order to define success we need to examine more closely, not just the project success factors, but some of the reasons for project failure.

The Standish Group (2013) propose several characteristics that contribute to project success – they list ‘10 Factors of Success’. These include in order of importance – executive support, user involvement, optimisation, skilled resources, project management expertise, Agile processes, clear objectives, emotional maturity, execution, and lastly tools and infrastructure. Interestingly, they are not supporters of tools and put this at the bottom of their success list. Their issue is that they believe that “organisations become too dependent on the tools and become slaves to the tools rather than using their own judgement and experience”.

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The Chaos Report (2013) by Standish outlines many reasons for lack of successful implementation including at the highest level - unclear or fluctuating requirements, technology ineffectiveness and organisational or managerial issues. At a more detailed level lack of project success reasons are attributed to lack of user input, incomplete requirements, changing requirements, lack of executive support, technology incompetence, lack of resources, unrealistic expectations and unclear objectives.

Cerpa & Verner (2009) examined software projects which weren’t successful to determine practices that affected project outcome. They concluded that projects are not successful for a combination of reasons and not just a single factor but that in most cases, an appropriate methodology was not used to manage quality.

IT projects lack of success was examined by Al-Ahmad et al (2009), and attributed to a taxonomy of several generic root causes. There are project management factors which include lack of user involvement and unclear scope or objectives. Organisational priorities and top management lack of commitment and support are other issues. Then there can be problems relating to complexity and technology challenges. They believe that by understanding the root causes there is a chance to improve project success.

A link is introduced between ‘critical success factors’ and a number of processes used in project management by Zwikael & Globerson (2006). They analysed 16 critical success processes which have the greatest impact on project success. Top contenders in this space were scope management, cost management and quality management, factors relating to the project management triangle. The critical success processes identified were not always given even weight by project managers and not enough time was given over to activities such as quality management planning.

Various studies were analysed by Neverauskas et al (2013) re project success criteria, starting with delivering the triad of budget, time and scope, but questioning does meeting these still produce a successful project. They summarised project success criteria and factors in a matrix to use for benchmarking projects. They don’t make suggestions specifically for quality management but purport that within project management there are a variety of suitable tools and techniques that will contribute to project success.

Zwikael (2009) remarks that that project managers do not always have time to do everything recommended in the PMBOK guide (PMI, 2013) and PMBOK does not prioritise which knowledge areas
are most important. They are therefore more likely to only perform the processes that they are familiar with, and possibly omit areas that may have a higher impact on project success.

In their study of planning capabilities across several industries Zwikael & Globerson (2007) found that project managers were weakest in the area of quality planning compared to other processes, and did not plan well regarding quality practices to be executed in the project. In ranking critical processes which impact on project success they list quality planning as being fourth in their ranking of sixteen planning processes behind resource planning, scope planning, and risk management planning.

Sigurðarson (2009) makes a distinction between project management success and project success. Project management success is achieving the balance between the triple constraints of time, cost and scope, whereas project success is fulfilling the project goals and satisfaction of the stakeholders. Müller and Turner (2007) define project success criteria as meeting a number of objectives such as the project purpose, realising user requirements, client satisfaction with results, increasing business with the client, as well as other defined criteria. Sigurðarson (2009) considers that successful project implementation is for the user to utilise the end product of the project and that quality is the satisfaction of the user requirements.

How project managers defined successful project implementation was studied by Procaccino and Verner (2006) and surprisingly from traditional measures of success it was quality (meeting requirements) that was most valued, whereas completing the project on time and within budget did not seem to have the same relevance. Project outcomes from an exploratory study of I.T. project managers definitions of success were ranked as follows: requirements were met (quality), product worked as expected (customer satisfaction), project was delivered when required, system was tested and error free, and project was completed at cost and on time. Derby and Zwikael (2012) consider that project success although judged by active management of the triple constraint should also be ascertained by the benefits that the project realises.

Glass (1999) also makes reference to different views on success or failure, and from a team member’s perspective, for those who worked on a particular project, their definition of project success was that they learnt new things along the way that could be applied to future projects.
In a survey of over 650 project managers Pinto and Slevin (1988) concluded that “project success” is multifaceted and is more than meeting cost, schedule and specifications. It was much more to do with client satisfaction with the final result. (Pinto and Slevin, 1988, cited in Prabhakar, 2008, p.4).

Atkinson (1999) also tries to lead us away from the notion that the project management triangle of time, cost and quality are the only criteria to measure project success on. The contention is that there are many other success criteria such as the financial benefits to the organisation, benefits to stakeholders, and technical strength of the end product. When commenting on project success criteria and the traditional project management triangle Atkinson (1999) describes cost, time and quality as “two best guesses and a phenomenon”.

Shenhar et al (2001) followed suit and proposed three project success dimensions. One was related to meeting specific project goals such as time, budget and requirements. Second was customer benefit which includes satisfaction and impact. Third was related to the organisational financial benefits and market share or growth.

Patanakul et al (2010) followed Atkinson, and defined four groups of success measures in their study on the use of tools and techniques and the impact on project success. They firstly look at the internal criteria of time, cost and scope (the traditional triangle). Then secondly, they look at customer satisfaction and two measures of success relating to the project outcomes. Thirdly, they look at the overall impact on the business and success measures re financial benefit and market competitiveness. Lastly they use a success measure relating to the overall project. These success measures (see table 2) were included in the researcher’s questionnaire to facilitate the definition of the project success for the participants.

### Table 2 - Project Success Measures - Patanakul et al (2010), page 50

<table>
<thead>
<tr>
<th>Success dimension</th>
<th>Success measures</th>
</tr>
</thead>
</table>
| **Internal criteria** | – Project came in on time or faster  
 – Project came in under budget or on budget  
 – Project met all specification requirements |
| **Customer** | – The outcomes of the project were used by its intended customers  
 – The intended customers of the project were satisfied with the outcomes of this project |
| **Business** | – Project created financial benefit for your organisation  
 – Project increased market competitiveness for your organisation |
| **Overall** | – Overall, this project can be considered a successful project |
3. Research Methodology and Methods

3.1 Introduction

The purpose of this chapter is to outline the research methodology and the research strategy and tools being used for this dissertation. Research methodology can be defined as a systematic inquiry that examines hypotheses and asks the questions that nobody has asked before, or re-examines existing research to bring it up-to-date. Research methods are the various processes and procedures used to do the research. Obviously, the purpose of the research is to ask a question, find the answers and interpret the data gathered. This is then shared with the wider community. Often there are new questions that arise out of the research. There are many different research methods based on different philosophies and principles. The choice of method is down to the researcher. Below the researcher has examined a few methods and chosen the ones that suit the needs of this dissertation topic.

The author used the research onion model from Saunders, Lewis and Thornhill (2012) as a starting point (see figure 14). This model can be adapted to various research projects and it is an effective model to use as a study aid. The ‘research onion’ outlines the stages that must be considered to develop a research methodology. Saunders et al (2012) contended that developing a research methodology was like an onion and that the researcher would proceed through the layers to form an effective methodology.

![Research Onion](image.png)

Figure 14 - The Research Onion - adapted from source: Saunders et al (2012)
The ‘research onion’ model consists of six layers: 1) Research Philosophy, 2) Research Approach, 3) Research Strategies, 4) Choices, 5) Time Horizon, and 6) Techniques and Procedure. Saunders et al propose that the researcher works through the layers to reach the heart of the onion and deciding on data collection techniques and analysis process.

3.2 Research Philosophy

Research Philosophy per Saunders et al (2012) is developing the research background, and research knowledge. The Research Paradigm is the methodology for thinking about the research question and how to go about it. The researcher must understand the research philosophy to be able to appreciate the various approaches for the research methods.

Bryman (2012) says a research philosophy refers to the set of beliefs regarding the nature of the reality being investigated. Research should have a practical purpose and that it should help us make sense of the world around us. The tenets in the research philosophy contribute to how the research should be done. Development of theories involves usage of research methods which are driven by the philosophy. (Flick, 2015).

Holden and Lynch (2004) maintain that a philosophical perspective is necessary for research as it challenges the researcher to open their mind to other possibilities and enriches the research skills. It is not just about the methodology of research but the accompanying mind-set when carrying out the research. Easterby-Smith et al (2002) believe philosophy can help the researcher structure their thoughts and their research strategy.

Crossan (2003) offers his theory on philosophy in that by its circuitous nature the questioning often evokes more questions, and promotes deeper thinking. Proctor (1998) believes that some reflection on one’s own personal values could give a broader understanding of philosophical issues such as the connections between ontological (reality), epistemological (knowledge), and methodology – how a researcher determines what she or he believes can be known.

Ontology is concerned mainly with the study of reality, while epistemology studies the nature of knowledge. The position taken will dictate the methodology employed. Philosophies can be either subjectivist or objectivist. The researcher’s methodology will be based on one of the following paradigms - Positivism, Interpretivism or Realism.
Positivism is based on objective research, where the researcher gathers data and information. The researcher does not have any influence over the research. The Positivism approach per Easterby-Smith et al (2006) is mainly connected with observations and measurements to collect data. It presupposes that there is an objective reality and that people can come to know this reality. The belief in this approach is that there can be cause-and-effect patterns and the objective is to uncover the patterns. Bryman (2012) held that positivism involves elements of both an inductive and a deductive strategy.

Interpretivism implies that the researcher has to interpret certain components of the research. This approach means that the researcher might try to understand specific business situations and give meaning to results in that context. Easterby-Smith et al (2006) believe the researcher’s own beliefs and values are important in this approach. Interpretive methods are qualitative, interactive and include observations, interviewing, as well as analysis of existing literature.

Realism holds that entities exist independent of our consciousness and are based in what can be sensed by an individual or experienced in the real world. Saunders et al (2012) argue that our knowledge of reality results from social conditioning. Within this theory the researcher will attempt to substantiate beliefs and values.

Philosophy for this dissertation is based on the concept of Ontological Interpretivism which is conducive to the mixed methods approach below.

3.3 Research Strategy and Approach

There are several approaches to research which include Inductive or Deductive, Quantitative or Qualitative, or Mixed Method.

Inductive and deductive are two different approaches when it comes to research. Inductive is more exploratory and open-ended, whereas a deductive approach is more focussed and is primarily concerned with proving a theory or hypothesis. The inductive approach is to generate new theories, likely through qualitative research, while the main emphasis of deductive is causality and usually it is quantitative.
Bryman (2012) described deductive theory as when a researcher deduces a hypothesis about something that is known in a particular domain, and then subjects it to empirical scrutiny. The hypothesis will have associated concepts that need to be translated into researchable elements, and specify how the data will be collected.

Quantitative research usually starts with a theory or concept. From this hypothesis the theory is then tested by finding the indicators which allow measurement of the concept. Data collection is usually standardised to meet criteria of reliability, validity and objectivity (Flick, 2015). Quantitative research is structured and data-led which focuses on measuring statistics and numbers. It is usually drawn from a data collection pool that is then data analysed, catalogued and reported on. Questionnaires and surveys are the main method of data collection, via mediums such as online, post or over the phone. Quantitative research is concerned with numbers, the emphasis is on figures. This makes it possible to statistically analyse the data. (Bryman, 2012).

Qualitative research is more focused on people’s thoughts, beliefs and choices. It can be based on hypotheses or notions on a particular topic where there is discussion around it. Participants discuss their feelings or reasons for certain behaviours or give their opinions on certain points. Focus groups, interviews or verbal surveys are the most popular forms of this research. Qualitative research does not include measurement, and it is difficult to standardise as it is often subject to opinion (Flick, 2015). There is also opportunity to provide space for commentary on a survey, as it aims to grasp the subjective meaning of topics from the point of view of the participant. The aim is to discover new outlooks on the condition under scrutiny.

One of differences between quantitative research and qualitative research is that the former starts with a theory whereas the latter develops a theory. In a quantitative approach data collection is standardised, and analysis is statistical, whereas a qualitative is open and the data analysis is interpretative (Flick, 2015).

Creswell (2013) believes that a mixed approach, integrating qualitative and quantitative data, is a very discerning approach. Fetters et al (2013) agree that “Mixed methods research studies draw upon the strengths of both quantitative and qualitative approaches”. The researcher can use qualitative data to validate the quantitative results. The mixed method is a dynamic approach and can be employed at various phases in the research project either in the design, the analysis or the reporting phase. The researcher has opted for the mixed method approach.
The approach for this research is a deductive “top-down” approach. The author will test the theory that quality management plan (QMP) and project management tools & techniques (PMTT) for quality selected for use in a project have influence on the success implementation. A deductive approach is less exploratory than inductive (Saunders et al, 2012) however the nature of research means that the two approaches can be used complimentary to each other as sometimes to test a hypothesis some inductive reasoning is required.

The main research method will be to conduct a survey. A questionnaire will be developed for data collection. The population will be drawn from project managers, I.T. managers and test managers working in the projects space in Dublin. Questions will include basic personal information such as name, job title, industry, years of experience. The detailed questionnaire will then include some questions on their use of the quality management plan (QMP), about what PMTT are important to them, and if they believe they influence project success factors. The next section will concentrate on what PMTT were employed during the project. There is also opportunity for qualitative input from the respondents who will have an opportunity to comment on the survey. The hypothesis will be to develop a relational link between project performance and tools employed. The latter falls in the category of Causal research which is usually conclusive because of its aim to reveal a cause-and-effect relationship between two variables. The aim will be to understand the QMP, PMTT and the significance of the effect on project success.

Secondary research continues with the Literature Review to consider and examine scholarly articles and theory on PMTT and linkages to successful project implementation. Since there are many PMTT available for use by project managers there is a question over how many are actually used in practice. Patanakul et al (2010) quote a study by Thamhain (1999) that indicated project managers only use 28% of identified PMTT. The author sources information through the academic search tools offered by the college library services.

3.4 Data Collection

Data collection is the process of systematically gathering and analysing information in research. This enables the researcher to answer their research question, prove their hypothesis and assess results. Regardless of approach (qualitative or quantitative) it is important that accurate data collection is conducted using formal methods.
The approach taken was a mixed methods research approach using a questionnaire with multiple choice questions (quantitative) with opportunity for feedback (qualitative) on the questions. The sample population was Project Managers working in a number of companies in Dublin, Ireland. The researcher used a network of contacts built up in industry through past employment, business relationships, special interest groups and industry forums and attempted to get a representative sample across approx. 50-100 respondents using a commercially available tool such as Survey Monkey.

3.4.1. Questionnaire

Questionnaires involve collection of information directly from the people who possess the information requires. The questionnaire design is important and should allow the structure that will allow the same data to be collected from a large variety of people in the same method so that it can be analysed systematically and either quantitatively or qualitatively. Questionnaires are the best way to collect factual information. Leung (2001) states the design of the questionnaire is critical to guarantee that one obtains valid replies to the research topic. Krosnick and Presser (2010) recommend reviewing other surveys to get ideas on best practice. Creswell (2013) advocates starting the survey design with an introduction to the basic purpose of the survey research and the rationale behind it.

In order to attain precise appropriate information careful consideration has to be given to the questions to be asked, how they are to be presented and in what order, and how they are formulated. The main objective should be to maximise the number of respondents to the questionnaire and to receive the required information. A sequence of suitable questions has to be presented clearly so that the respondent can convey and communicate the responses successfully. Stone (1993) maintains “an intelligible question is one which the respondent can understand. This means using the language that the respondent uses”.

Characteristics of a good questionnaire include its appropriateness for the research with the questions being asked. The questions should be unbiased, unambiguous and should be clear to both the researcher and the respondent. Per Stone (1993) questions should be “omnicompetent” which is that they can handle all possible responses, or least offer an opt-out category such as ‘other’ or ‘n/a’. Krosnick and Presser (2010) recommend avoiding technical terms, slang or jargon, and avoiding ambiguous wording, and to just stick with simple specific familiar wording. They propose avoiding leading questions, and making options exhaustive and only asking one thing at a time.
The length of the questionnaire should be practical in that long complex surveys may attract a lower response than short simple ones. The easier it is for the respondent to supply responses in a speedy manner the more likely they are to complete the questionnaire. The questions should be in either open or closed format. Open format means the response can be free text or qualitative which is the opinion of the responder. The benefit of this is it allows consideration of many possibilities relating to the topic. It can be used if multiple choice options are not applicable to the research. Closed format gives the respondent a choice between several specified options. It is also possible to use a mixture of open and closed, in that a list of selections is given with a final choice of ‘other’ with a commentary box for text. The advantage is that they are easy to complete, it is easier to code, analyse and report the results quantitatively.

Another option for a questionnaire is to use a rating scale, which is a forced choice format, whereby the researcher specifies a number of points on a scale. The most frequent one used is the Likert scale which uses five points e.g. Strongly Agree, Agree, N/A, Disagree or Strongly Disagree. The meanings of the points should be clear, and a midpoint on the scale can be offered as a ‘neutral’ or ‘no preference’ option. Many closed questions use Likert’s techniques whereby statements are offered and the respondents choose whether they agree or disagree, or answer yes/no.

To elicit responses Blau (2009) advises to ask for assistance as people feel a sense of accomplishment when the help someone solve a problem. Another method is to reach out to one’s support group as most people will have identified with specific groups with shared values who will empathise with the researcher. Krosnick and Presser (2010) deliberate that there are many reasons that respondents reply to surveys in addition to assisting the researcher. These could be due to desire for self-expression or self-understanding, an intellectual challenge or other emotional reasons.

Dillman (2011) opines that technology today has a great influence on how questionnaires can be distributed, as these days much more use can be made of social media and its associated technologies. He also recognises the trend towards self-administered electronic questionnaires. Leung (2001) believes self-administered questionnaire have the following advantages – they can be easily and economically processed in a standard manner, they can be done at the convenience of the responder, and they are confidential.
3.5 Limitations to the Research

The author recognises that there are some limitations to the research, as with any other research paper. One of the main limitations was in the access to the right population of participants. A sample group was selected from the authors own network of contacts and it was hoped that this group would complete the cross-sectional survey and circulate to their own contact groups. The author also posted on special interest groups online as well as LinkedIn and PMI boards. As this research was done during peak holiday period (June to August) responses were slow in coming back. This shortfall between the reality and what was anticipated had an impact on the quality and outcomes of the research.

Also the chosen approach of questionnaire was somewhat limiting as it involved the use of a commercially available free tool which limited the number of questions to ten. These questions had to be carefully formulated and presented with a mix of open and closed formats to be as effective as possible. Though a self-administered questionnaire had its advantages of being economic and easily disseminated it was hard to follow up to get people to complete it.

Another limitation was that the literature on use of the Quality Management Plan (QMP) was not widely available and was limited to text books rather than journal articles or critiques.

3.6 Ethical Issues

Ethics is an area in research that all researchers need to be aware of. Miller et al (2012) make us aware of a number of ethical challenges in research. There are issues regarding access to classified company data, relevant participants, as well as addressing concerns re confidentiality, data privacy, and information disclosure. The author needs to ensure that the research is ethical and that no organisations or persons are portrayed in a bad light by the findings. There is nothing controversial asked of respondents during the survey. There is a likelihood that negative feedback from contributors will be received on their organisations. Any information received of this nature will be kept completely confidential by the researcher.
4. Data Analysis/Findings

The aim of this chapter is to disclose the findings and the data analysis obtained after completing the primary research. The findings are presented in quantitative data which was acquired through an online questionnaire, and qualitative data which was obtained via the same questionnaire via open format questions with text boxes for commentary.

4.1 Survey Results

The main body of the primary research involved the questionnaire. This was administered via SurveyMonkey. This is a free online survey tool which allows the researcher to create a survey using question format templates. There are 17 different formats for formulating questions made up of multiple choice, open format, yes/no, etc. SurveyMonkey can share the link either via social media or via direct email. The survey was disseminated to over 100 targeted recipients working in project management in blue-chip companies in Dublin via social media, LinkedIn message and direct email. The link was shared, eventually reaching 116 participants, with 48 responses which is a return rate of 41%. The following chapter will review the work in detail and discuss the implications of the findings.

4.2 Demographics of Respondents

The purpose of question 1 was to establish the demographics and backgrounds of the participants.

4.2.1 Industry

Of the 48 respondents, 30 worked on Financial Services projects, 14 identified as working in I.T. and 4 were in IT Consulting.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Services</td>
<td>63%</td>
</tr>
<tr>
<td>Information Technology</td>
<td>29%</td>
</tr>
<tr>
<td>IT Consulting</td>
<td>8%</td>
</tr>
</tbody>
</table>

Table 3 - Industries of respondents
The respondents work in a wide range of blue chip companies such as JPMorgan, Citi, IBM, Accenture, AIB, Hewlett Packard, BNY Mellon, BNP Paribas, Invesco, IFDS/State Street, Northern Trust, eircom, Google, RSA Insurance, UPC, ICON Plc, and Bord Na Mona. Several identified as consultants.

### 4.3.2. Project Management experience

Of the 48 respondents, who had 513 years of project management experience between them, the average length of experience was 11 years. 5 respondents (10%) had over twenty years of experience. 9 respondents (19%) had between 16 and 20 years of experience. 6 respondents (13%) had between 11 and 15 years of experience. 15 respondents (31%) had between 6 and 10 years of experience. The remaining 15 respondents (27%) had 5 years or less experience.

![Graph 1 - Question 1](image)

### 4.2 PMI and PMBOK

**Question 2** - the purpose of question 2 was to determine if the respondents were members of the Project Management Institute (PMI) and/or Project Management Professional (PMP) certified, and to assess their familiarity with the PMI Project Management Body of Knowledge (PMBOK). Also to find out what other methodology was used if they didn’t follow PMBOK.

From the 48 respondents only 15 (31%) were PMI PMP certified. However 41 contributors (85%) were familiar with the PMBOK. 44% (21) of those who replied said their organisations followed the PMI PMBOK methodology.
Question 2 also included an option for commentary as respondents were asked if they didn’t follow PMBOK “If the answer is NO, what methodology do they use?” 32 contributors gave input.

38% of those who commented stated that they had an in-house developed or proprietary methodology which may use elements of either PMI or Prince2, or other approaches. 22% indicated that they followed the Prince2 methodology. 13% revealed that they were using Agile or Scrum methodologies. 16% also said that they were unclear re their company’s methodology. 1 participant (3%) said their company was using the Capability Maturity Model. Another (3%) specified they were using an Enterprise PMO tool that managed project deliverables including quality. The remaining 6% were from the consulting community and adapted to whatever methodology the client company was using.

4.3 Use of a Quality Management Plan

Question 3 described the Quality Management Plan and asked how likely the respondent was to use one. The question asked of informants was “The Quality Management Plan describes how the quality policy for a project will be implemented by the project management team. It includes approaches to quality assurance, quality control, and continuous process improvement. In a typical project, how likely are you to use a Quality Management Plan?” 23% replied that they were ‘Extremely likely’ to use one, with 29% ‘Very likely’ and 25% ‘Moderately likely’. The remaining 23% were either ‘Slightly likely’ (13%) or ‘Not at all likely’ (10%).
When the question was asked specifically of PMI members and their usage of a Quality Management Plan only 13% replied that they were ‘Extremely likely’ to use one as opposed to 23% of the overall population, although 33% were ‘Very likely’ as opposed to 29% of the overall population. 40% of PMI members were ‘Moderately likely’ to use one versus 25% of total responders.

**Question 3** also included an option for commentary as respondents were asked if they didn’t use a Quality Management Plan “*If not what do they use?*” 19 contributors gave input. 32% of those who commented stated that quality planning was done as part of the Test Strategy or Master Test Plan documentation, and possibly dependent on the Test Manager. 21% admitted that there was no quality planning in place and it wasn’t given as much focus as it should have. 16% said they had an in-house developed or proprietary methodology which had its own approach to quality planning. 16% said it was dependent on the size of the project and at the discretion of the PM. 11% said they were currently
trying to introduce it in their organisation. 1 participant (5%) said their company was using Scrum to manage quality.

4.4 Quality Management Plan inclusions

Question 4 queried if the Quality Management Plan was used, which elements were included in it.

The main components that were incorporated were as follows – 76% included “who will be involved in managing quality for the project”; 72% included “the processes to be followed to help ensure quality”; 72% included “parts of the project or deliverables to be measured and scheduled” and 70% included “reports that will address quality”. 63% included both “the quality practices and standards that apply to the project” and “metrics used to measure quality”. 50% included “meetings to be held to manage quality”. Only 48% included “Project Management tools and techniques (PMTT) to be used”.

<table>
<thead>
<tr>
<th>Question 4: If you use a Quality Management Plan, which of the following does it include?</th>
<th>Included</th>
<th>Included</th>
<th>Not Included</th>
<th>Not Included</th>
<th>N/A</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>The quality practices and standards that apply to the project</td>
<td>26</td>
<td>63%</td>
<td>7</td>
<td>15%</td>
<td>12</td>
<td>22%</td>
</tr>
<tr>
<td>Who will be involved in managing quality for the project</td>
<td>35</td>
<td>76%</td>
<td>3</td>
<td>7%</td>
<td>10</td>
<td>17%</td>
</tr>
<tr>
<td>What processes will be followed to help ensure quality</td>
<td>33</td>
<td>72%</td>
<td>6</td>
<td>13%</td>
<td>9</td>
<td>16%</td>
</tr>
<tr>
<td>Meetings to be held to manage quality</td>
<td>23</td>
<td>50%</td>
<td>15</td>
<td>33%</td>
<td>10</td>
<td>17%</td>
</tr>
<tr>
<td>Reports that will address quality</td>
<td>32</td>
<td>70%</td>
<td>7</td>
<td>15%</td>
<td>9</td>
<td>16%</td>
</tr>
<tr>
<td>Metrics that will be used to measure quality</td>
<td>26</td>
<td>63%</td>
<td>10</td>
<td>22%</td>
<td>9</td>
<td>16%</td>
</tr>
<tr>
<td>Parts of the project or deliverables to be measured and scheduled</td>
<td>33</td>
<td>72%</td>
<td>4</td>
<td>9%</td>
<td>9</td>
<td>20%</td>
</tr>
<tr>
<td>The Project Management tools and techniques (PMTT) to be used?</td>
<td>22</td>
<td>48%</td>
<td>14</td>
<td>26%</td>
<td>12</td>
<td>26%</td>
</tr>
</tbody>
</table>

Graph 5 - Question 4

Of the items not included - 33% do not include “meetings to be held to manage quality”, 26% do not include “Project Management tools and techniques (PMTT) to be used” and 22% do not include “metrics used to measure quality”. 15% do not include “the quality practices and standards” nor “report to address quality”. A number of respondents answered “N/A” as they don’t use Quality Management Plan for various reasons.

Question 4 also included an option for commentary as respondents were asked “What other areas would you include in the Quality Management Plan not mentioned above?” 16 contributors gave an opinion.
35% of those who commented stated that they would include reference to project governance and roles and responsibilities of staff accountable for quality. 24% would include testing deliverables such as normally found in the Test Strategy or Master Test Plan documentation. 18% would include change management, scalability and constraints. The other 4 respondents indicated they would include operational readiness criteria (6%), budget (6%), continuous improvement / quality reviews (6%) and Third Party client needs (6%).

4.5 Quality Tools & Techniques Used

Question 5 listed the Project Management tools & techniques (PMTT) used for quality planning and asked respondents which ones they used. The question asked of informants was “Project Management tools and techniques (PMTT) used for quality planning include benchmarking, cost/benefit analysis, experiment design, and brainstorming. Which of the following do you use?”

<table>
<thead>
<tr>
<th>Q5. Project Management tools and techniques (PMTT) used for quality planning include benchmarking, cost/benefit analysis, experiment design, and brainstorming. Which of the following do you use?</th>
<th>Frequently</th>
<th>Often</th>
<th>Sometimes</th>
<th>Total Used</th>
<th>Never</th>
<th>Don't know what this is</th>
<th>Total Not Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmarking</td>
<td>0%</td>
<td>27%</td>
<td>33%</td>
<td>67%</td>
<td>51%</td>
<td>2%</td>
<td>35%</td>
</tr>
<tr>
<td>Cost/Benefit Analysis</td>
<td>29%</td>
<td>30%</td>
<td>21%</td>
<td>88%</td>
<td>10%</td>
<td>2%</td>
<td>13%</td>
</tr>
<tr>
<td>Cost of Quality (COQ)</td>
<td>2%</td>
<td>19%</td>
<td>21%</td>
<td>42%</td>
<td>46%</td>
<td>13%</td>
<td>58%</td>
</tr>
<tr>
<td>Design of Experiments (DOE)</td>
<td>4%</td>
<td>6%</td>
<td>27%</td>
<td>31%</td>
<td>42%</td>
<td>27%</td>
<td>65%</td>
</tr>
<tr>
<td>Brainstorming</td>
<td>49%</td>
<td>35%</td>
<td>17%</td>
<td>92%</td>
<td>4%</td>
<td>4%</td>
<td>8%</td>
</tr>
<tr>
<td>Statistical Sampling</td>
<td>4%</td>
<td>17%</td>
<td>29%</td>
<td>50%</td>
<td>44%</td>
<td>6%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Graph 6 - Question 5a

Brainstorming is the most popular project management quality tool used with 92% participants using it either frequently (40%), often (35%) or sometimes (17%). The next most popular PMTT is Cost/Benefit Analysis at 88%, respondents use it either frequently (29%), often (38%) or sometimes (21%). Benchmarking at 67% is third with usage at frequently (6%), often (27%) or sometimes (33%).

Design of Experiments at 69% ‘not used’ was the least popular project management quality tool – 42% never used it, and 27% don’t know what it is. Cost of Quality was not used by 58%, 46% never used it and 13% didn’t know what it was. Statistical Sampling was used by 50%, and not used by 50%.
Question 5 also included an option for commentary as respondents were asked “Do you use any other PMTT not specified?” 5 contributors gave an opinion.

20% of those who commented stated that they would include some Six Sigma or CPI tools. 20% would include ratio of test days to ratio of development day for resource planning. 20% would include Root Cause Analysis (RCA). 20% would include proof of concept / prototyping. 20% would include Agile/Lean.

4.6 Seven Basic Quality Tools Used

Question 6 listed the seven basic quality (7QC) tools used for quality planning and asked respondents which ones they used. The question asked of informants was “Of the seven basic quality (7QC) tools, listed below, which ones do you use?”

<table>
<thead>
<tr>
<th>Q6. Of the seven basic quality (7QC) tools, listed below, which ones do you use?</th>
<th>Frequently</th>
<th>Often</th>
<th>Sometimes</th>
<th>Total Used</th>
<th>Never</th>
<th>Don't know what this is</th>
<th>Total Not Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause and effect</td>
<td>0%</td>
<td>15%</td>
<td>32%</td>
<td>48%</td>
<td>48%</td>
<td>4%</td>
<td>52%</td>
</tr>
<tr>
<td>Flowchart</td>
<td>44%</td>
<td>29%</td>
<td>18%</td>
<td>83%</td>
<td>13%</td>
<td>0%</td>
<td>13%</td>
</tr>
<tr>
<td>Checksheet</td>
<td>29%</td>
<td>38%</td>
<td>9%</td>
<td>74%</td>
<td>15%</td>
<td>0%</td>
<td>21%</td>
</tr>
<tr>
<td>Pareto diagram</td>
<td>2%</td>
<td>4%</td>
<td>17%</td>
<td>23%</td>
<td>56%</td>
<td>21%</td>
<td>77%</td>
</tr>
<tr>
<td>Histogram</td>
<td>0%</td>
<td>8%</td>
<td>21%</td>
<td>33%</td>
<td>55%</td>
<td>10%</td>
<td>78%</td>
</tr>
<tr>
<td>Control chart</td>
<td>2%</td>
<td>17%</td>
<td>26%</td>
<td>48%</td>
<td>40%</td>
<td>13%</td>
<td>52%</td>
</tr>
<tr>
<td>Scatter diagram</td>
<td>2%</td>
<td>0%</td>
<td>22%</td>
<td>31%</td>
<td>60%</td>
<td>8%</td>
<td>69%</td>
</tr>
</tbody>
</table>
Flowchart is the most frequently used basic quality tool used with 88% participants using it either frequently (44%), often (29%) or sometimes (15%). The next most popular QC tool is Checksheet at 79% - respondents use it either frequently (29%), often (35%) or sometimes (15%). The other basic quality tools are less utilised with Cause and Effect diagrams and Control Charts both at 48%.

 Pareto Diagram at 77% was the least popular basic quality tool – 56% never used it, and 21% don’t know what it is. Scatter Diagram is used by 69%, 60% never used it and 8% didn’t know what it was. Histogram is not used by 66%, 56% never used it and 10% didn’t know what it was.

Question 6 also asked of the seven basic quality (7QC) tools “Which tools do you believe are most effective and contribute towards successful implementation?” 20 people responded with multiple selections, 31 elects in total.
Flowcharts was most popular with 11 votes, with Checksheets getting 5 votes and Cause and Effect diagrams getting 4 votes, followed by Pareto chart at 3, and Control chart, Scatter diagram and Histogram all at 1 vote each. 5 people mentioned other tools and methods which were not related to the seven basic quality tools.

4.7 Importance of Quality Plan and Quality Tools

**Question 7** asked participants to rate a number of statements as ‘Very important’, ‘Important’, ‘Moderately important’ or ‘Not important’. The statements that the respondents were asked to validate were: - “How important is the Quality Management Plan?” “How important is the Quality Management Plan to successful project implementation?” “How important is the use of PMTT?” and “How important is the use of PMTT to successful project implementation?”

80% contributors reported that the Quality Management Plan (QMP) is either Very Important (40%) or Important (40%), and 77% conveyed that the QMP was important to project successful implementation with elects of Very Important (31%) or Important (46%). 17% felt that the QMP was Moderately Important, and 17% it was Moderately Important to successful project implementation. 4% believed that the QMP was Not Important, and 6% believed it was not import to successful project implementation.
Only 13% respondents consider that the use of Project Management Tools & Techniques (PMTT) is Very Important, whereas 54% think they are Important. 33% think they are either Moderately Important (25%) or Not Important (8%). 67% consider the use of PMTT to successful project implementation to be Very Important (13%) or Important (54%), the rest think it is Moderately Important (25%) or Not Important (8%).

4.8 QMP Project Success Dimensions

Question 8 listed project success dimensions and asked the respondents the question as to which ones were influenced by the Quality Management Plan (QMP). “The Quality Management Plan focuses on defining quality for the project and planning how it will be achieved. In your opinion, which of the following success dimensions and measures does it contribute towards?”. The analysis was done in three parts as there was a lot in the question and some very valuable feedback.

The choices on the first part of question 8 included project criteria of Time, Cost and Quality where 79% believe the QMP contributes ‘Quite a lot’ towards the success criteria ‘Quality’ of the project. 42% held that it contributed towards project success criteria of ‘Time’ and ‘Cost’. Only 6% believed that it contributed ‘Very little’. More people (48%) thought that the QMP only ‘Somewhat’ contributed to project success criteria of ‘Cost’ than ‘Quite a lot’ at 42%, or very little at 6%. For project success criteria of ‘Time’ 42% indicated that it contributed ‘Quite a lot’ or ‘Somewhat’, whereas 13% indicated that the QMP contributed ‘Very little’ towards time.
Only 2% thought that the QMP contributed ‘Not at all’ to project success criteria of ‘Quality’, whereas 4% believed that the QMP contributed ‘Not at all’ to ‘Time’ and ‘Cost.

The choices on the second part of question 8 of the question included whether the QMP contributed to customer success criteria of ‘Project meets requirements’ and ‘Customer Satisfaction’. It also asked if QMP contributed towards business success criteria ‘Financial Benefit’ and ‘Enhanced Competitiveness’.

Regarding the success criteria relating to the customer, the highest response of 60% was that the QMP contributed ‘Quite a lot’ toward ‘Customer satisfaction’ and 52% believed it also contributed ‘Quite a lot’ towards the ‘Project meets requirements’. 40% felt that the QMP contributed ‘Somewhat’ to the ‘Project meets requirements’ and 27% thought it contributed ‘Somewhat’ to ‘Customer satisfaction’. Less respondents (10%) felt that QMP contributed ‘Very little’ to ‘Customer satisfaction’ and 6% to ‘Project meets requirements’. Only 2% considered that the QMP contributed ‘Not at all’ to either.

![Graph 13 - Question 8 part 2](image)

Regarding the success criteria relating to the business, there was less people who believed that the QMP contributed ‘Quite a lot’ towards ‘Financial benefit’ (19%) or ‘Enhanced Competitiveness’ (6%). The general consensus was that it contributed ‘Somewhat’ to Financial benefit (63%) or ‘Enhanced Competitiveness’ (60%). Those who opted for ‘Very little’ were 15% regarding ‘Financial benefit’ and 23% re ‘Enhanced Competitiveness’. 10% respondents thought QMP had ‘Not at all’ to do with ‘Enhanced competiveness’ and 4% regarding ‘Financial benefit’.

The final part of question 8 asked if the QMP contributed towards ‘Overall project implementation success’. 48% stated ‘Quite a lot’, 42% ‘Somewhat’, 8% ‘Very little’ and only 2% ‘Not at all’.

53 | P a g e
4.9 QMP Project Success Factors

**Question 9** listed a number of project success factors relating to the use of the Quality Management Plan (QMP) and asked the respondents to agree or disagree with the statements relating to the following question. “In your experience of using a Quality Management Plan, which of the following statements would you agree or disagree with?”. The analysis was done in **three parts** as there was a lot in the question and some very valuable feedback.

The statements relating to ‘Project Success’ that were evaluated on the **first part of question 9** included project criteria of “The project came in on time or faster”, “The project came in on budget or under budget” and “Project met all specification requirements”.

![Graph 14 - Question 8 part 3](image1)

**Graph 14 - Question 8 part 3**

![Graph 15 - Question 9 part 1](image2)

**Graph 15 - Question 9 part 1**
Responses were low regarding the ‘Strongly Agree’ opinion on the QMP influence on whether “The project came in on time or faster” (6%) or if “The project came in on budget or under budget” (6%). They were higher re ‘Strongly Agree’ regarding the “Project met all specification requirements” (29%). More respondents stuck with the ‘Agree’ option when it came to “The project came in on time or faster” (40%) or if “The project came in on budget or under budget” (44%). They were slightly higher re ‘Agree’ regarding the “Project met all specification requirements” (46%). Some respondents disagreed with the statements “The project came in on time or faster” (33%), “The project came in on budget or under budget” (29%) and “Project met all specification requirements” (6%). There were no ‘Strongly Disagree’ responses. Some people chose ‘N/A’ as they do not use a QMP.

The choices on the second part of question 9 of the question asked whether respondents in their experience of using the QMP whether they agreed with statements relating to customer success or business success. The statements respondents were asked to agree or disagree with included “The outcomes of the project were used by its intended customers”, “The intended customers were satisfied with the outcomes of this project”, “Project created financial benefit for your organisation” and “Project increased market competitiveness for your organisation”.

Regarding “Customer success: The outcomes of the project were used by its intended customers” then 73% either ‘Strongly Agree’ (27%) or ‘Agree’ (46%) with this statement. With regard to “Customer Success: The intended customers were satisfied with the outcomes of this project” 71% either ‘Strongly Agree’ (31%) or ‘Agree’ (40%) with this statement. There were only 6% and 8% who disagreed with either of these statements, and 21% who answered ‘N/A’ because they don’t use a QMP.

![Graph 16 - Question 9 part 2](image)
Regarding “Business Success: Project created financial benefit for your organisation” 59% either ‘Strongly Agree’ (15%) or ‘Agree’ (44%) with this statement. With regard to “Business Success: Project increased market competitiveness for your organisation” 48% either ‘Strongly Agree’ (4%) or ‘Agree’ (44%) with this statement. 17% disagreed with “Business Success: Project created financial benefit for your organisation” and 27% either ‘Disagreed’ (21%) or ‘Strongly Disagree’ (6%) with “Business Success: Project increased market competitiveness for your organisation”. 25% who answered ‘N/A’ because they don’t use a QMP.

The final part of question 9 asked in the experience of using a Quality Management Plan (QMP) would you agree or disagree with the statement “Overall the project was considered a successful project”. 76% are in agreement with the statement they either ‘Strongly Agree’ (21%) or ‘Agree’ (52%). 6% ‘Disagree’ and none for ‘Strongly Disagree’. 21% opted for ‘N/A’ because they don’t use a QMP.

4.10 Other Project Success Factors

Question 10 was an open ended question and asked of informants was “In your opinion, aside from the above mentioned success criteria, using a Quality Management Plan (QMP) also contributes to what other success factors?”. For the analysis of this I grouped the responses in broad themes.

16% commented on the project team and that engaged team members and users with product knowledge contributed to the project success. 14% thought use of the QMP meant more focussed testing, better defect management and reduced rework. 12% believed that it meant more successful stakeholder engagement, focussing senior management on success criteria and led to transparency re
expectations. 10% thought that using a QMP supported lessons learnt and contributed to shared learning which could be leveraged for future deliveries.

Graph 18 - Question 10

6% believed that it was good that the QMP clearly defined roles and responsibilities relating to quality. 8% believed use of the QMP led to better client satisfaction due to a better quality product. 12% agreed with the key principles behind usage of the QMP in that it sets out the plan for quality and how quality requirements will be achieved, and that people sign up to the plan which is tracked and controlled just like the overall project plan. 20% of the contributors replied that they had no comment or that they didn’t know.
5. Discussion

This chapter will review and interpret the results from the findings and will attempt to answer the research questions in this paper. The research questions asked “is there a relationship between the use of a Quality Management Plan and successful project implementation” and “does usage of the quality tools & techniques available make a difference in the overall quality of the project and influence the end outcome”. The author will refer to the primary data and the literature review to help reach conclusions.

5.1 Project Management Methodology

Results from questions 1 and 2 showed that less than a third of respondents were PMI PMP certified although the majority were familiar with the PMI Body of Knowledge (PMBOK). Many respondents were also familiar with Prince2 and related the PMI Quality Management Plan (QMP) to the Prince2 Quality Management Strategy document. This Prince2 document is very similar in that it comprises any specific quality management processes to be followed, any tools and techniques, reporting on quality management, roles and responsibility for quality, and included a Quality Register with planned dates for quality management activities (Prince2, 2009).

Wideman (2002) while comparing the two, states that Prince2 is a formal methodology rooted in structured project management processes allowing PMs to logically follow a highly prescriptive route through the project lifecycle, whereas PMBOK is a more general framework based on a set of standards and processes. Its flexibility allows it to fit with other methodologies such as Agile and Prince2 to holistically address the needs of an organisation. This would appear to fit with feedback from contributors that those who don’t fully use PMI or Prince2 use elements of PMI to fit with their bespoke methodology or alongside Agile or Scrum. This explains why 77% of respondents were extremely to moderately likely to use some kind of Quality Management Plan (QMP).

5.2 Quality Management Plan (QMP) Usage & Inclusions

Quality planning is important but if the ultimate goal is to satisfy the needs of the end consumer, then the user will probably be completely unaware of the practice of a QMP (Munns and Bjeirmi, 1996). Other methods used in lieu of the QMP include a Master Test Plan (MTP) the purpose of which is to orchestrate testing across all the different levels of testing throughout the project lifecycle. The goal of
the MTP is to manage the strategy, resources, responsibilities, risks and issues relating to quality control (Craig and Jaskiel, 2002), so there is some overlap between the QMP and the MTP.

There were those who admitted there was no quality planning in their organisation or that it depended on the experience of the Project Manager (PM), or whether the PM opted to use one or not. Zwikael and Globerson (2006) conclude that although the quality plan process is deemed important, project managers do not use it enough “Quality planning, which has a moderate impact on all measures of project success, has a very low actual extent of use by project managers”. This was consistent with the author’s findings.

There was a lot of consensus as to the components that were to be included in the QMP which included who was to be involved, what processes were to be followed, project deliverables to be measured and metrics, quality reporting and meetings, and quality practices and standards to be applied. The author found that literature on the contents of the QMP was in scarce supply, in accord with Rose (2005).

Less than half the respondents included the quality tools and techniques to be used in the QMP. Some commentators gave reasons for this. Several mentioned that it is dependent on the size of the project how much is included in the QMP, and it was discretionary if the PM decided to use it or not. Others erroneously mention ‘tools’ that should be included such as anomaly tracking tools, requirements management tools, etc., which would be seen traditionally as automated testing tools. Quite a few also made reference to the MTP and including testing ‘tools’ in that. There generally seemed to be some confusion between the QMP and the MTP. The other position that evolved later on in the questions was that there was generally unfamiliarity with a number of the tools and techniques. This is consistent with Besner and Hobbs (2012) who concluded that the average use of the quality toolset was the third lowest of nineteen project management toolsets studied.

The majority of respondents disclosed that they thought the QMP was an important part of project planning and that the QMP was important to successful project implementation.

5.3 Quality Management Tools & Techniques

Most popular amongst the quality Project Management tools & techniques (PMTT) is brainstorming. Contributors say that it is beneficial for planning tasks required for the quality plan (Schwalb, 2012) and
also it is useful for capturing risks and issues for the quality plan (Pritchard, 2014). Another popular tool is **cost-benefit analysis** which is frequently used to evaluate the economic reasons for doing a project by giving a fiscal value to project costs and tangible benefits (Roosen, 2012). Responses indicate that **benchmarking** is also used for improving project processes (Ibbs, 2002) and comparing capabilities with key competitors (Zink, 2012). These tools may be used frequently but that does not determine how well they are used in practice during project implementation, though it can be assumed that experienced PMs know what they are doing (Patanakul et al, 2010).

Of the seven basic quality (7QC) tools, those that were commonly used also were flowcharts, checksheets and cause and effect diagrams. Contributors believe these tools are most effective and contribute towards successful implementation. **Flowchart** was used to demonstrate work breakdown, and considered an important tool to provide a visual aid for communication to stakeholders (Brajer-Marczak, 2012). Feedback was also that the flowchart is the tool most widely used, and hence probably most effective (Madu, 2012). **Checksheets**, per contributors, work well for capturing data (Bothe, 2001) for progress reporting, and providing clarity to stakeholders. **Cause and effect** diagrams, such as the fishbone diagram, were deemed useful for problem solving (Tague, 2005).

Other PMTTs that were not highly rated nor used were **design of experiments** (DOE) and **statistical sampling**. There is a close link between statistics and DOE, and statistical experimental design is linked mainly to industry and engineering (Montgomery, 2009). A working knowledge of statistical methods is required to be able to compute and interpret results; this could be why these tools are not commonly used. **Cost of quality** is another tool that requires some expertise, this time in Finance, as the purpose is to cost out tangible and intangible expenses relating to quality in a number of areas (Juran, 1951). Due to the difficult nature of trying to accomplish this task it is an area that people shy away from.

A number of other tools that were not used frequently or at all were **Pareto diagram** and **Histogram**, both of which are often used in manufacturing processes to track error in a production line (Hart, 1989).

The majority of respondents relayed that they thought the use of PMTT was an important part of project planning and that the use of PMTT was important to successful project implementation. This concurs with Neverauskas et al (2013) who maintain that within project management there are a variety of suitable tools and techniques that will contribute to project success.
5.4 Successful Project Implementation

The survey asked a number of questions about what the Quality Management Plan (QMP) contributed to success project implementation. Quality per Sigurðarson (2009) is the satisfaction of user requirements and successful project implementation is for the user to utilise the end product. The majority of the respondents believed that the QMP contributed quite a lot towards the ‘quality’ of the project. Successful project criteria is meeting all specification requirements (Müller and Turner, 2007; Procaccino and Verner, 2006). Zwikael & Globerson (2007) found that project success was most significantly impacted by quality management.

Many articles on project success made reference to the fact that it is much more than meeting the criteria of the project management triangle cost, time and scope, and that other factors had to be considered such as stakeholder and customer benefits, client satisfaction, financial benefits to the organisation, market share or growth (Pinto and Slevin, 1988; Prabhakar, 2008; Atkinson, 1999; Shenhar et al, 2001). Patanakul et al (2010) summarised these general themes in their four groups of success measures which were included in the researcher’s questionnaire to facilitate the definition of the project success for the participants.

Participants were less than convinced that the QMP had anything to do with project success criteria of time and cost with less than half of participants agreeing, and most thought it only somewhat contributed, but didn’t quantify this in any way. Quite a few actually disagreed that QMP influenced that the project was on schedule or on budget.

When it came to use of the QMP to influence customer satisfaction respondents were much more positive towards this success statement. They were also positive when it came to meeting requirements and project outcomes.

Few contributors believe that the use of the QMP has any strong influence on the business success criteria of financial benefit or enhanced competitiveness as most just somewhat agreed with these. A quarter of respondents believe that the QMP has very little or no influence on financials or competitiveness.

Regarding the final success criteria that using a QMP has an influence on the overall consideration of project success there was a huge support for this statement with three-quarters of participants agreeing with this point.
5.5 Conclusions / Recommendations

The research undertaken in this paper has revealed that regardless of the discipline PMI, Prince2 or other, participants are aware of and know that they should be doing more effective quality planning. Some participants even acknowledged that their organisation has no approach to quality planning, the reasons being either that it is not supported or promoted by their organisation or that it is dependent on the Project Manager’s desire to use one or based on their previous experience. Participants consider the Quality Management Plan (QMP) to be an important part of project planning and that overall the QMP is important to successful project implementation, however real world examples and literature on the subject of the QMP are in short supply (Rose, 2005).

The majority of the respondents don’t include quality tools and techniques in the QMP, as they are mostly unfamiliar with this toolset and indicate that the size of the projects might dictate if tools and techniques are used or not. The literature points to the fact that the quality toolset is one of the least used in project management (Besner and Hobbs, 2012).

Of the tools and techniques that are known and frequently used, these are tools that are more widely used than just as quality tools which is more probably why they are more popularly used than others (Patanakul et al, 2010). This includes brainstorming which is useful for any planning task (Schwalb, 2012); cost-benefit analysis which is used for costing project value (Roosen, 2012); and benchmarking use for comparing capabilities and processes against competitors (Ibbs, 2002; Roosen, 2012). This was also true of the seven basic quality (7QC) tools – flowcharting can be used effectively from different perspectives for a number of things such as mapping documents, data and systems (Sterneckert, 2003; Madu, 2012; Brajer-Marczak, 2012) so again it can be used for many processes other than quality. Checksheets and cause-and-effect diagrams can be used in a number of knowledge areas (Bothe, 2001; Tague, 2005) so though usage is deemed valuable that may not just only be in the quality planning process.

With regard to successful project implementation the area that most participants feel was influenced by the QMP was in the area of quality management (Sigurðarson, 2009; Zwikael & Globerson (2007); meeting user requirements (Müller and Turner, 2007; Procaccino and Verner, 2006) and customer satisfaction, as in the outcomes of the project were met (Patanakul et al, 2010). Generally, in the researcher’s opinion, most participants felt like they should be doing better quality planning, and that if
they were doing so it would contribute to these success factors, however the reality is that they are probably not doing it as well as they could do.

Quality planning is critical to the success of the project. Zwikel and Globerson (2007) conclude that some project managers are not that experienced in the area of quality planning and need more training on tools and techniques which can support this process.

“Quality planning, which has a moderate impact on all measures of project success, has a very low actual extent of use by project managers” (Zwikael and Globerson, 2006).
6. Reflection on Learning

6.1 Introduction

This chapter on reflections on learning explores how this post-graduate student thought and felt about her own learning as part of the Masters of Business Administration (MBA) course. The student reflected on both knowledge gained and the experiential aspects of both her own and her classmates’ learning. This includes observations on what methods helped her learn, barriers to learning, and benefits gained from multiple approaches. In the words of the famous philosopher and educator John Dewey (1933) “We do not learn from experience... we learn from reflecting on experience.”

As expressed by Nobel Laureate and Carnegie Mellon Professor Herbert Simon in his theories on how people learn the emphasis has changed to being able to utilise knowledge gained instead of just remembering and repeating information. Simon (1996) believes that students should be able to acquire the academic tools and learning approaches during their education that will assist them in their intellectual journey, and by attaining the experience of how to ask insightful questions about a variety of subjects that it would inspire the student to continue along a path of life long, self-sustaining learning. This was certainly my experience.

6.2 Personal Reflection

Over the past two years I have reflected many times on my reasons for undertaking the MBA in Project Management in DBS and often wondered if I’d done the right thing. Having completed my undergraduate degree in DBS in 2002 in Management Information Systems by night part-time over three years it had been on my mind to go back and do a master’s degree at some point. It had taken quite a bit of time and effort so I put that thought on hold for a bit.

Following my undergraduate degree I worked in a variety of roles within project management and had progressed to a leadership role managing a team of project managers, business analysts and testers. I wanted to gain a more formal recognised qualification in project management and thought that combined with an MBA I would realise better career opportunities, acquire new knowledge and obtain additional skills.

It had been over eleven years since I had completed my undergraduate degree and after a number of years in professional life I had forgotten the time commitment required to hold down a full-time job as
well as trying to attend classes two or three times a week and complete assignments. I was out of my comfort zone of the business working environment that I was used to. This was quite a challenge which forced me to revitalize my disposition for learning and knowledge acquisition.

6.3 DBS MBA

The MBA programme offered, as well as some core subjects, the opportunity to choose some elective modules from a chosen specialist route in my case Project Management. The course consisted of many excellent core business modules relating to Management, Marketing, Finance and Business Strategy, as well as preparing for our MBA dissertation with Research Methods. The MBA was well structured with taught modules being split into twelve week semesters part-time evenings over two years. The modules were presented and assessed in a variety of methods including lectures, tutorials, case studies, and both individual and group projects.

There were about forty students in the class from a variety of industries and with differing professional backgrounds. This was a diverse group of both young and middle aged students, some with little or no business knowledge and some with many years of working experience. Through studying the MBA we had ample opportunity to discuss and debate with each other and engage in interesting dialogues in the classroom. For the first semester we were all together for the core modules which allowed us ample time to bond and form alliances. Thereafter we were split into our elective modules while continuing to share one core subject per semester. This allowed there to be continuity in our associations.

The lectures were well presented with the depth of experience being obvious from the calibre of the lecturers we were assigned. Each lecturer was well versed in their designated subject and prepared their course material in advance of each class, and shared via Moodle, the college’s online learning platform. The lecturers prepared us with sufficient knowledge through the classes, the discussions and practical work for mid-term and end of term assignments and exams. It was challenging to absorb all the information while trying to do independent study and progress the assignments simultaneously.

6.4 Theoretical Approaches to Learning

There are many theoretical approaches dedicated to trying to understand the process in which we learn. People learn in different ways from each other at different paces and under diverse conditions. The learning can be gained in a variety of methods, in both formal and informal ways, individually or in group settings, or can be through self-learning, or in a one-to-one coaching or mentoring method.
One might wonder what motivates a student to learn. Maslow (1943) believes that people move up a hierarchy of needs based on fulfilling each level of need and the desire to do so. At the top of the pyramid is self-actualisation, see figure 15 below.

Maslow believes that humans are motivated to seek fulfilment and change through personal growth. This is a key motivator for the MBA student the journey of personal discovery leading to a sense of accomplishment, finding a meaning in life and ultimately self-actualisation. Self-actualisers have many characteristics typical of an MBA student in that they are highly creative, self-accepting, objective, spontaneous, democratic, problem solvers, interpersonal with a deep appreciation of life-experience. Although each person achieves self-actualisation in their own way, it is a continual process which is ongoing rather than reaching that state and never moving on from there.

Per Maslow (1943, p.383) self-actualisation “refers to the person’s desire for self-fulfilment, namely, to the tendency for one to become actualised in what one is potentially ….. to become everything that one is capable of becoming.” This I can say was a strong reason for me to complete my MBA.

When we compare behaviourist theories of learning to the cognitive theories, in the former the student is passive and the lecturer assertive, and the student only responds routinely as expected, whereas in comparison the latter encourages active learning. Both the teacher and the student engage dynamically and the teacher selects the best technique to convey understanding.
Gagne (1975) started out in behaviourist tradition, but later on became influential in the area of learning and memory information-processing. Gagne (1975) is recognised amongst educators as being influential in the area of instructional design. He outlined a series of successive phases that occur during learning – following on from motivation, these are: motivation, apprehension, acquisition, retention, recall, generalisation, performance and feedback.

Gagne recognises five major domains of learning: verbal information, intellectual skills, cognitive strategies, motor skills and attitudes. Gagne deems it crucial to identify the most apt way to deliver teaching to the student that would promote successful learning, as each of these domains would require different learning conditions. Gagne believes that mastery of intellectual skills is the domain of learning most important to education, which includes simple and complex problem solving, interacting with new knowledge and applying reasoning to new situations and concepts. Many MBA students experience different methods of learning through cognitive strategies, whereby the student contributes to their own knowledge and understanding through their experience. This was true in the case of the DBS MBA the approach of the programme was to guide me as a student towards using my intellectual skills to the best of my ability in the curriculum.

Kolb (1984) is known for his Experiential Learning Theory (ELT) which encompasses a four-stage experiential cycle of learning. Kolb’s cycle starts with the ‘immediate or concrete experience’, which is then ‘observed and reflected’ on and integrated into ‘abstract concepts’ which can then be tested by ‘active experimentation’ to create new experiences. The cycle repeats itself – experience, reflection,
absorbing, and then assimilation. Reflective Observation is essential as it involves taking a break from the activity and reviewing the experience, allowing the student opportunity to make sense of it.

![Kolb’s four-stage experiential cycle of learning – recreated by the author](image)

Kolb has often quoted Confucius as a direct association with his experiential learning theory: “I hear and I forget. I see and I remember. I do and I understand”.

Kolb also suggests that student’s understanding of a topic or task becomes more sophisticated that they loop into a learning spiral, which repeats the experiential cycle of learning. The student asks deeper questions, they reflect on and understand, and their achievements are more productive. Kolb offered his opinion on this in an interview with Sparrow (2009): “When a concrete experience is enriched by reflection, given meaning by thinking, and transformed by action, the new experience created becomes richer, broader, and deeper.”

Kolb also maintains that everyone has their own preference for learning and presents us with a processing continuum with opposing modes of learning styles related to how we approach a task and the emotional response in how we think or feel about it. One relates to doing or watching (grasping experience), the other being feeling or thinking (transforming experience). Kolb indicates that students who are aware of their learning styles can substantially influence their performance. During the DBS
MBA I had plenty opportunity to learn about new things through lectures and discussions (feeling), presentations and notes (watching), but also putting that theory into practice by completing in-class exercises, group work and assignments (doing) to complete the cycle of learning.

In Sparrow’s article (2009) Peter Honey commented that Kolb inspired both he and Alan Mumford when developing their Honey and Mumford Learning Styles Model (1982). They adapted Kolb’s model with the same assumption that people have preferred learning styles but rather than only one style that this is dependent on the situation and experience. Honey and Mumford (1982) devised a questionnaire to test learning styles and classifying it into four categories: Activist, Reflector, Theorist, and Pragmatist.

As part of our Business Strategy group assignment we got to evaluate our learning styles in the context of the team paper. I could see a balance between my styles of Activist and Pragmatist. I have an open minded approach to learning and like to learn by doing, immersing myself wholly in the new experience. I enjoy change and variety. Within the team context I enjoyed brainstorming, group discussion and problem solving with the other team members. The Pragmatist in me liked to make practical decisions that moved the team forward and reaching a consensus on that. Once I could integrate the theory and the application I could move on.

![Honey & Mumford Learning Styles Model](image)
6.5 Self-Development

During our first semester we had a Personal and Professional Development (PDP) module. This gave us the opportunity to learn more about ourselves through use of a workbook called ‘Skills for Success’ by Stella Cottrell, and other tools such as Honey and Mumford learning styles, Myers Briggs personality types and Belbin Team Roles. The PDP module covered a number of different tools and techniques to help me understand myself, my learning style, develop my core skills in time management, creative problem-solving techniques, people skills, critical thinking, and to broaden my outlook in general.

During the PDP module my Myers Briggs personality type was identified as ESFP based on the Myers-Briggs Type Indicator (MBTI). This was developed in 1942 by mother-daughter team Isabel Briggs Myers and Katharine Briggs, built on the original theories of Carl Jung (1921). Jung had suggested four different methods by which we experience the world around us – sensing, intuition, feeling and thinking, with one of two orientations extravert or introvert. This combination of orientation and experiential method gave rise to 16 unique types. The MBTI proved useful for understanding the different ways our classmates communicated, thought and interacted based on their personality type.

Some of my ESFP strengths include wanting to experience everything there is to experience. I want to experiment with new things and prefer to see and do. I love to perform and be the centre of attention, as well as being a high achiever. This suited me in class as I loved the dynamics of interacting with the lecturer through lively discussion and banter. I am practical, observant and have excellent people skills. This led me to be a natural leader amongst my peer group, particularly in group assignments.

The downside of the ESFP personality type is that I can get easily bored, and I do better with dynamic, practical subjects (like project management) rather than heavy invariable theory heavy subjects. ESFPs are also very sensitive, and this can be a drawback in a classroom situation if I feel like I am being criticised or picked on, leading to withdrawal. Fortunately this was never the case in DBS and I felt thoroughly included in all aspects.
Another concept we covered in the Personal and Professional Development model was The Belbin Team Roles. This was developed by Meredith Belbin in 1981 and includes a test to measure for a preference for one of nine team roles denoting behaviour traits or specific competencies in a working environment. An individual may frequently exhibit strong leanings towards multiple roles. The usefulness of the Belbin Team Roles is that it can be used to create a high-performing self-aware team, with a balance of skills and behaviour, and the behaviour can be adapted to suit the needs of the team objective.

During our group assignments through years one and two we got to be aware of our team 'persona' or specific competency profiles. My team persona was fairly evenly balanced between Resource Investigator (People Oriented), Coordinator (People Oriented) and Completer Finisher (Action Oriented). The positive aspect of assuming these team personas was that I am generally extrovert by nature, and I am cheerful and gregarious. I like to communicate with others and presented new ideas to the team for consideration. I am a strong coordinator and challenged others at crucial times. Obviously there were some allowable weaknesses too. I was inclined to worry and somewhat reluctant to delegate some tasks, but very aware of my weaknesses and worked within the team to ensure that we continued to collaborate and make decisions together which affected the team. The Completer Finisher in me ensured that I was meticulous in polishing and perfecting things, searching out errors and omissions, and delivering on time.
6.6 New Skills

Having worked in the projects environment for over twenty years I was looking for the time and opportunity to refocus my career. Interestingly enough I changed jobs during the course of my MBA. I moved from Financial Services (Funds) into Clinical Research Organisation (CRO) for Drug Development. I was immediately assigned to a project to select an enterprise wide project planning tool for cross functional collaboration, to enhance organisational planning capability, and to improve the value and usefulness of business management reports. I was fortunate enough that my new role allowed me ample opportunity to put into the practice what I was in the process of learning during my course – business strategy, project management planning and control, and financial analysis.

The course also provided opportunity to focus our thoughts on the bigger picture outside of our comfort zone including the global economy and big business issues. This was the focus of our lecturers in International Management, Finance, Marketing and Business Strategy.

They challenged us to think for ourselves critically, to read newspapers and articles to learn about the world around us. I became much more aware of global events, business news, and economic issues.

Many of the exercises and assignments gave rise to circumstances where we were compelled to present to both the lecturer and the class on a variety of topics and proposals. This gave us a chance to improve our public speaking and to become more confident presenting to groups.

We also had occasion to learn about managing people, and getting the best out of groups of people working together. During our group assignments we had ample opportunity to put into practice what we had learnt and to work together with a team of high achievers all wanting to excel. This also led to making some lifelong friendships from that intense cooperative period that will also be potentially invaluable contacts in the future.
6.7 Challenges

There were definitely drawbacks to doing a part-time MBA. It was challenging to attend classes, study and complete assignments while simultaneously trying to hold down a fulltime job. It would have been nice to get totally immersed into a full-time academic environment to concentrate fully on my studies. It was definitely stressful to try and leave work on time, spending evenings and weekends in college, completing both individual and group assignments while juggling work and family commitments. I had some personal conflicts too whereby my partner was hospitalised for nearly a month during my final term assignments, however my tutors were very understanding. This required pulling on deep energy reserves, mustering enthusiasm, and time management skills. Many personal sacrifices were made and social occasions became few and far between. The challenges were definitely made easier by the alliance of my fellow classmates on the course, who were engaging and entertaining as well as supportive. The lecturers on the evening modules were also sympathetic and considerate of the difficulties we faced as part-time students.

"Challenges are what make life interesting and overcoming them is what makes life meaningful." - Joshua J. Marine.

6.8 In Summary

In summary, completing my MBA in DBS, though it was a huge commitment and extremely challenging, I thoroughly enjoyed it. I was never inclined to miss a class unless I really couldn’t help it through illness, personal circumstances or travelling for work. I always felt motivated and inspired by my lecturers and classmates. The range of subjects covered was spot on and the variety of learning methods expertly employed by the experienced lecturers. I learnt a lot about myself through carefully crafted exercises and assignments, recognising how I best acquired knowledge, what some of my personality traits were, and how I worked as a team member. I also acquired many new skills as part of my MBA programme. I have a huge sense of personal achievement and self-satisfaction that I was able to complete it.
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Appendices

Questionnaire

Questionnaire - Quality Management Plan survey.pdf

Questionnaire Responses

Survey Monkey Questionnaire Responses.pdf
Declaration

I, Adrienne Reddan, declare that this research is my original work and that it has never been presented to any institution or university for the award of Degree or Diploma. In addition, I have referenced correctly all literature and sources used in this work and this work is fully compliant with the Dublin Business School’s academic honesty policy.

Signed: Adrienne Reddan

Date: 21st August 2015