

# **Use of technology and its influence on project success**

## **A study of e-commerce companies in Ireland**

A Dissertation Presented in Partial Fulfilment of the requirements for the Degree in

Masters of Business Administration in Project Management

awarded by

Liverpool John Moores University and the Dublin Business School

Under the Supervision of:

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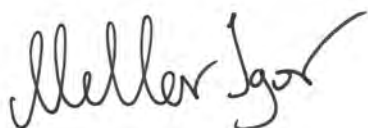
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## Declaration

I, Igor Meller, declare that I am the sole author of this dissertation, that during the period of registered study I have not been registered for other academic award or qualification, nor has any of the material been submitted wholly or partly for any other award. This dissertation is a result of my own research work and where other people's research was used, they have been duly acknowledged.

Signed:

A handwritten signature in black ink that reads "Meller Igor". The signature is written in a cursive style with a long, sweeping flourish at the end.

Igor Meller

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## Acknowledgments

An MBA student does not travel the journey in the pursuit of knowledge alone. The influence and support of many individuals have guided me from an idea to a fulfilled dream.

I am heartily thankful to my supervisor Mr. John Lamont, lecturer within the Management Department at the Dublin Business School in Dublin, Ireland who guided me in writing this paper and supported me in any questions. His experience and knowledge contributed to my continuous progress with this dissertation.

Mr. Paul Taffe, lecturer within the Management Department at the Dublin Business School, inspired me through his lectures and passion to undergo this research.

I would also like to thank all of the lecturing and library staff at Dublin Business School for their constant support and professionalism throughout all the stages of the MBA Program.

I would like to thank all my friends who encourage me to finish the MBA program. Their continuous excitement for me to undergo this research provided the encouragement I needed, especially when procrastination took over.

I owe a special thanks to Agatha for her unconditional support and patience throughout this process. Her ability to be supporting and encouraging was crucial in my completion of this program.

Finally a deep gratitude is due to my parents whose encouragement in all of my projects throughout my life has been an endless source of support for me.

## Table of Content

Declaration.....	2
Acknowledgments .....	3
Table of Content .....	4
List of Tables .....	8
List of Figures .....	9
List of Abbreviations .....	10
Abstract.....	11
1 Introduction .....	12
2 Literature review.....	18
2.1 Project.....	18
2.2 Project Management .....	19
2.3 Project Stakeholders .....	21
2.4 Project Success.....	22
2.5 Technology in Project Management .....	23
2.6 E-Commerce.....	24
2.6.1 E-Commerce in Ireland.....	25
2.6.2 Automation in Project Management .....	27
2.6.3 Technology in E-commerce.....	27
2.7 Tools and software in Project Management.....	28
3 Research Methodology .....	30
3.1 Introduction .....	30
3.2 Methodology Approach .....	31
3.2.1 Research Objective .....	32
3.2.2 Research Hypothesis.....	32
3.2.3 Research Question .....	33
3.3 Research Method .....	34

3.3.1 Positivism .....	34
3.3.2 Deductive .....	35
3.3.4 Survey.....	35
3.3.5 Quantitative Research.....	36
3.3.6 Qualitative Research .....	36
3.3.7 Cross Sectional .....	36
3.4 Sample .....	37
3.5 Time Horizon .....	38
3.6 Primary Data Collection and Analysis .....	38
3.7 Secondary Data Collection .....	39
3.8 Questionnaire .....	39
3.9 Ethics.....	40
3.10 Researcher Bias.....	40
3.11 Limitations .....	41
3.12 Assumption to Research .....	42
4 Data Analysis and Findings.....	43
4.1 Analysis .....	43
4.1.1 Research Environment .....	43
4.1.2 Data Collection Process.....	45
4.1.3 Demographic Sample .....	45
4.1.4 Project Stakeholders .....	47
4.1.5 Technology and Projects.....	51
4.1.6 Project Success.....	54
4.2 Findings .....	58
4.2.1 Research Question 1 .....	58
4.2.2 Research Question 2 .....	59
4.2.3 Research Question 3 .....	60

5	Conclusions .....	61
5.1	Conclusion to First Hypothesis .....	61
5.2	Conclusion to Second Hypothesis .....	62
5.3	Conclusion to Third Hypothesis .....	63
5.4	Summary .....	64
6	Recommendations .....	65
7	Self-Reflection on own Learning and Performance .....	66
7.1	Skills Development .....	67
7.2.1	Cognitive Skills.....	68
7.2.2	Research Skills .....	69
7.2.3	Critical Analysis Skills.....	69
7.2.4	Interpersonal Skills.....	69
7.2.5	Personal Management Skills .....	69
7.2.6	Management Skills .....	70
7.3	Challenges and Problems Encountered .....	70
7.4	Future Applications of Gained Knowledge.....	71
7.5	Conclusion .....	71
8	Bibliography .....	73
9	Electronic Resources .....	78
10	List of Appendices .....	80
10.1	The Survey Questionnaire .....	80
10.2	The Survey Consent Form .....	83
10.3	Results Question 3 .....	84
10.4	Results Question 4 .....	85
10.5	Results Question 5 .....	85
10.6	Results Question 6 .....	86
10.7	Results Question 11 .....	86

10.8 Results Question 12 .....	87
10.9 Results Question 13 .....	88
10.10 Cross Tabulation: Question 3 – Question 7.....	88
10.11 Cross Tabulation: Question 3 – Question 10.....	89
10.12 Cross Tabulation: Question 3 – Question 14.....	91
10.13 Cross Tabulation: Question 5 – Question 9.....	93
10.14 Cross Tabulation: Question 5 – Question 14.....	95
10.15 Cross Tabulation: Question 9 – Question 10.....	97

Word Count: 20150

## List of Tables

Table 1: Research Structure .....	34
Table 2: Question 1: Industry description (Source: Author) .....	46
Table 3: Question 2: Respondents company size -by employee number (Source: Author).....	46
Table 4: Question 6: Respondents current company position (Source: Author) .....	47
Table 5: Experience and company size (Source: Author) .....	48
Table 6: Experience and Team size (Source: Author).....	48
Table 7: Question 7: Project team size (Source: Author) .....	49
Table 8: Question 4: Respondents role in project (Source: Author) .....	50
Table 9: Question 9: Confidence with the tools (Source: Author) .....	51
Table 10: Question 10: Use of tools in managing a project (Source: Author).....	53
Table 11: Question 11: Usefulness of the tools when working with a project team .....	53
Table 12: Question 8: Average project paste (Source: Author) .....	55
Table 13: Question 12: Average on tools effectiveness.....	56
Table 14: Question 14: Contribution of tools to project success (Source: Author) .....	57



## List of Figures

Figure 1: The Iron Triangle (Atkinson, 1999).....	13
Figure 2: The Square Route (Atkinson, 1999) .....	13
Figure 3: PM Success model (Zekic, et al. 2012) .....	14
Figure 4: Project Management Process (PMBOK, 2009).....	20
Figure 5: Project Team Structure (Source: Author).....	22
Figure 6: The research Onion (Sounders et al. 2008).....	31

## List of Abbreviations

CAPM	Certified Associate in Project Management
CORP	Corporation
E-commerce	Electronic commerce
E-mail	Electronic mail
EU	European Union
IBM	International Business Machines
IDA	Industrial Development Agency
INC	Incorporated
IT	Information Technology
MBA	Master of Business Administration
NASA	National Aeronautic and Space Administration
OECD	Organisation for Economic Co-Operation and Development
PERT	Project Evaluation and Review Technique
PERT	Program Evaluation and Review Technique
PM	Project Management
PMBOK	Project Management Body Of Knowledge
PMI	Project Management Institute
PMP	Project Management Professional
R&D	Research and Development
SPSS	Statistical Package for Social Sciences
US	United States

## Abstract

This research dissertation examines the impact of technological tools used by project managers on the success of undertaken projects as it is little known about success of project management in regards to tools and systems used.

The main purpose of presented dissertation was to test how professional experience impacts use of tools and what tools in eyes of experienced stakeholders contribute to success of undertakings. This paper is built around multinational e-commerce companies active in Dublin, Ireland. In order to make this research more specific the author focused on stakeholders involved in project environment in these companies.

A quantitative approach has been used as instrument to generate the data. It explores potential of use of technology in order to manage projects effectively and efficiently. A survey questionnaire was distributed among stakeholders involved in the project environment of largest players on the market. These include DropBox Inc., eBay Inc., Facebook Inc., Google Inc., IBM Corp., LinkedIn Inc., PayPal Corp. and Salesforce Corp.

The research findings conclude that there is significant impact of implemented technology and usage of different technologies in managing and executing projects on the general outcome of the undertaking, however it is up to the experience of a project manager which tools to choose and how to utilize them effectively leading the project towards the goal.

## 1 Introduction

Organizations invest substantial resources into technology initiatives intended to generate advantages associated with improved use of human resources, increased operational efficiencies and creating new capacities within processes and products; however literature review indicates there is little knowledge regarding how technology can influence project success.

The utilisation of right technology can streamline project managers roles and speed task completion time. The true value of technology in project management is the way in which it is utilized—it can improve communication, help in risk assessment and control scheduling, but only under assumption that proper tools are used in the right way and at the right time.

In the modern marketplace, the infusion of technology has led to considerable changes in business practices, particularly those that relate to marketing, communication, and workload distribution (Moncrief et al, 1999). Technology plays a major role in supporting project managers in managing projects effectively and efficiently.

For the purpose of this study the term technology is used to denote communication tools, such as email, instant messengers or mobile phones, but also scheduling and budgeting tools, data storage and cloud computing, allowing project managers to access information anytime, from anywhere in the world.

Project Management, defined by Project Management Institute, is the “application of knowledge, skills, tools and techniques to project activities to meet the project requirements” (PMBOK, 2001). A further definition by Oisen defines project management as the application of a collection of tools and techniques to direct the use of diverse resources towards the accomplishment of a unique, complex, one-time task within time, cost and quality constraints. Each task requires a particular mix of these tools and techniques structured to fit the task environment and its life cycle, from conception to completion of the task (Oisen, 1971).

While there are different views of success of the project management, academic world defines basic criteria against which projects can be measured. The criteria for success, namely cost, time and quality are often referred to as The Iron Triangle. Please see Figure 1 below (Atkinson, 1999).

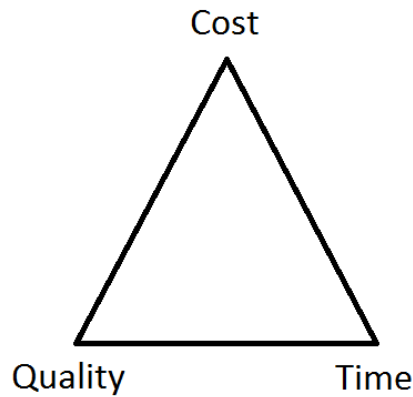


Figure 1: The Iron Triangle (Atkinson, 1999)

In his study, Atkinson found out that the use of the Iron Triangle, as the criteria of success is not presenting the full picture, and may result in a biased measurement of project management success. He further suggests extending the Iron triangle and developing it into “The Square Route” presented in Figure 2.

Atkinson’s findings are important to this research as they include an Information system that in nowadays economy and fast changing environment is crucial for companies success. The researcher is also convinced that information systems are a crucial element contributing to the project success, through their connectivity, accessibility and functionality.

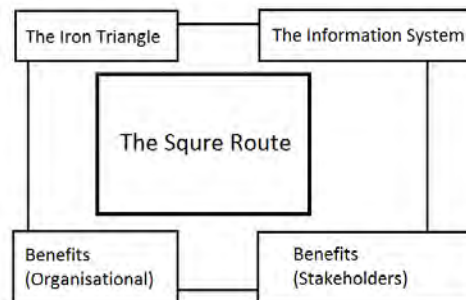


Figure 2: The Square Route (Atkinson, 1999)

Project success also understood as the success of the project management, is a result of the dynamic interaction of stakeholders’ goals, project environment, project resources and project organization. Figure 3 presents the dependence between elements mentioned above. The efficiency reflects the speed and harmony of informational, financial and material flow which indicates the flexibility of a company’s project realization. Effectiveness reflects the degree of achieving primary project goals while situational conditions refer to environment circumstances (Zekic, et al. 2012).



**Figure 3: PM Success model (Zekic, et al. 2012)**

Projects are defined as temporary undertakings with a defined begin and end date and are designed to produce a unique product, service or deliverable (PMBOK, 2001). Turner further suggested that project management could be described as: the art and science of converting vision into reality (Turner, 1996). In other words, it is project managers responsibility to keep elements of projects, such as planning, organization, monitoring and control of all aspects of a project together with motivation of all involved in achieving the project objectives safely and within agreed time, cost and quality criteria under supervision.

Project managers are crucial to the success of a project and it is up to their unique skills that a project achieves a success or becomes a failure. They are leaders who can effectively function strategically, operationally and humanly (Shenhar et al., 2005). But how successful a modern project manager can be without the set of tools that contemporary technology delivers? Available resources that help to manage complex tasks, keep all stakeholders updated and all data safe and accessible from any location in the world, are, if in the right hands, the source of competitive advantage in nowadays economy. Keeping the stakeholders informed is an often neglected but vital part of running a successful project.

There are many ways to inform stakeholders - from using collaborative software that informs clients of the project status, to creating status reports, to having daily or weekly meetings (Bowen, 2011). The above mentioned methods give a company the benefit of sharing unique information simultaneously keeping all interested parties of the project up to date. The goal of accessibility is to make sure that data is available to the people who need it, when they need it and in a manner that helps them do their job faster and better (Morrison, 2013).

The focus of this quantitative study is to determine the relationship that exists between wide understood technology and its impact on the success or failure of the projects. As emerging technologies became crucial to the organizational success, it is essential to use the right tools in the right way (Bell, 2006).

Organizations are being advised that to remain competitive, they must efficiently and effectively create, locate, capture, and share their organization's knowledge and expertise, and have the ability to bring that knowledge to bear on problems and opportunities (Rifkin, 1996).

The results from the "Technology and its influence on Project Success" questionnaire measured impact of tools commonly used in project management and their impact on success of undertaken projects. The survey was created in order to collect deductive data and measure the degree of project success and its dependency on used tools.

A quantitative approach was a more appropriate choice than a qualitative approach for answering the questions because the purpose of the current research was to examine the association between variables and to gain wide picture of the researched topic.

The presented study targeted project staff; project managers, sponsors and other stakeholders involved in project activities, in order to research the wide understanding of impact that available technologies have on project success. Its main goal is to find areas of improvement and point out weak spots in existing project environment. Results of the research are directed to academic bodies, Dublin Business School and e-commerce companies based in Ireland, active globally and depending on projects development.

The researcher undertook the project inspired by a study conducted by IBM in 2008 researching 1500 practitioners worldwide constructed to gain knowledge on how to increase project success and to learn how to improve the outcome. It was found that about 41% of projects were successful and met objectives within planned time, cost and quality. But on the other hand 59% of projects could not reach at least one of the objectives or failed completely. IBM came to the conclusion that project success does not largely depends on technology, but rather people. Furthermore the findings showed that those two factors have a synergetic benefit, which means it is not their proportion that leads to their success. There is a broad academic content research on the people, but very little about the impact of technology. (IBM, 2008)

To close that gap in this framework for project success this dissertation seeks to survey the use of wide understood technology. The focus is its impact on project success and to explore the relationship between application of technology and project outcomes. Furthermore the research will

determine the most effective tools used for increasing the probability of success of the projects undertaken in e-commerce companies in Ireland, Dublin.

The primary source of research data for this study came from the online survey distributed among stakeholders involved in projects. The survey targeted e-commerce companies active in Dublin, Ireland as large, successful e-commerce companies settle this area. Their global growth and product innovation is an indication for successful project management which means they found a working synergistic benefit between those two factors, namely people and technology and therefore can be considered as source of best practices for other companies, which will be outlined in the recommendations section of this study.

The quantitative study identified following assumptions; the first assumption was that the participants of the survey would answer all the questions truthfully and honestly. The second assumption was that all participants would participate on voluntary basis; the third one was that all participants are involved in project roles within an e-commerce organization. Last, all participants were previously involved in at least three projects.

Limitations encountered may have occurred due to inadequate measurement of variables or the unavailability of participants, which may hinder data collection. The study was limited to those participants agreeing to voluntarily participate and answer the survey questions to the best of their knowledge. If any unanswered questions were found in the survey, the results were not eliminated from the study, resulting in limitations to the results of the study. The sample was limited to participants working for e-commerce companies, located in Dublin, Ireland.

This dissertation is organized in 7 chapters and is structured as follows;

Chapter 1 provides an introduction to the study, presents the motivation and research questions, and explains the importance of the study.

Chapter 2 contains thorough literature review and focuses on the secondary data collection, introducing the definitions of topics important for the study. This section focuses on views of different authors on the topic providing academic background to the area of study.

Chapter 3 outlines the research design and methodology, including an explanation of the research procedure and descriptions of the methods used. This chapter is divided into various sections including research approach, data collection and sampling methods.



Chapter 4 reports the data analysis and discusses the preliminary findings of the empirical research. In this chapter the researcher presents and illustrates the findings from the quantitative data analysis.

Chapter 5 aims at drawing general conclusions and proving the research hypothesis through interpretation and justification of the findings presented in chapter 4.

In chapter 6 the researcher focuses on recommendations for further research in the topic.

Finally chapter 7 contains researchers reflections on own learning and the transformation of the researcher's learning style, performance and skills development over the course of the MBA program.

Undertaking and preparation of the study involved costs and expenditures. An Expenses plan has been prepared and private budget secured in order to complete the assignment. The researcher alone has covered all costs connected to the work presented.

The researcher is personally involved and engaged in the project environment of a large e commerce company located in Dublin, Ireland. Experience in data collection and analysis, gathered in the professional activities and over the course of education makes the researcher fully fitted with knowledge and skills needed to conduct the study.

## 2 Literature review

According to the Handbook of mixed research; the secondary data, also called “existing or available data” are data that were originally recorded or “left behind” or collected at an earlier time by the different person (Tashakkori, 2002). Secondary data will be collected from books, journals, company reports, archived research data, online databases and other commonly available literature sources.

The literature review on the topic of project success showed reach number of examples and materials helping to deepen and understand the terminology and ideas behind the issue. Project Management as a discipline is relatively new to the academic environment; nonetheless it has been richly explored and researched in the past. Also the topic related to project success has been mentioned by multiple researchers (Lavagnon, 2009). In his work Lavagnon analysed articles on project success from two scientific journals on project management trying to determine the parameters which define project success. His research explores the concept of success from the view on differences between project management success and project success. The results confirmed that project success is ambiguous and multidimensional and concluded that project success requires more attention than project management success due to its diversity.

It is indisputable that people and resources are at the heart of project management, as Nidiffer and Dolan rightly observed, nonetheless tools and technology play a major role in supporting project managers in planning and managing projects effectively and efficiently (Nidiffer, et al, 2005).

Several studies have addressed the importance of leadership and project managers styles (Anantatmula, 2008; Hyväri 2006), however not much can be found on the aspect of available technological tools and the impact its use has on projects and its success and what role they play in project planning, execution and summary. The expected result of the undertaken study is to close the literature gap in the context of e-commerce environment.

### 2.1 Project

Providers and users of enterprise solutions have adapted project management methods and approaches initially developed in the engineering and construction disciplines to enable the complex planning and implementation activities for a solution to meet its intended objectives (Crawford, 2000).

In order to understand project management, one must begin with the definition of a project. A project can be considered to be any series of activities and tasks with a specific objective, defined start and end dates; that is multifunctional and consumes limited resources (Kerzner, 2009).

Another definition provided by the Project Management Institute says, a project is a temporary endeavour undertaken to create a unique product or service. Temporary means that every project has a definite beginning and a definite end. Unique means that the product or service is different in some distinguished way from all other products or services (PMI, 2000).

Recognition of the strategic importance of project management in the corporate world is rapidly accelerating. One reason for this acceleration may be a strong belief by business leaders that aligning project management with business strategy can significantly enhance the achievement of organizational goals, strategies, and performance (Srivannaboon, 2006). Other reason is the innovation and R&D that strongly relies on project management, whether it concerns a new product, process or even techniques and structures used by nowadays companies. Over €700 million euro were invested in R&D and Innovation in Ireland in 2011 (IDA Ireland, 2013).

## 2.2 Project Management

For centuries, people have managed and completed immensely complex projects, from the Great Wall of China to the pyramids of Egypt (Frame, 1994).

Historically project management responded to the need to create civil and building works of high complexity. In the 1950s project management achieved greater prominence when the planning and control concepts were applied to much more complex projects such as those of the US navy and subsequently NASA space projects. In the last couple of decades project management has emerged as a business process tool with broad application in the corporate world (Shenhar, 1996). It is due to rising complexity of the business world that companies started to look into Project Management, as analysing and focus improving discipline. The transformation from military to business is mostly visible in the World War II period, where shrinking wartime labour supply demanded new organizational structures. Introduction of network diagrams, called PERT charts and the critical path method gave managers more control over very complex projects. Going further, the available technology allowed managing projects that were global, cross industrial and on a large scale. This and the pressure on nowadays companies to achieve results quickly led to transformation of project management into the modern business (Lientz, 2001).

Project management is in nowadays companies a specialized form of management, similar to other functional strategies, that is used to accomplish a series of business goals, strategies, and work tasks within a well-defined schedule and budget. The essence of project management is to support the execution of an organization's competitive strategy to deliver a desired outcome (Milosevic, 2003).

Nowadays projects come in all shapes and sizes. Academic world has in recent years very much improved understanding of project management tools and techniques. However, the impact of technology on the success of undertaken projects leaves a gap for researching.

Competitive pressures impacting e-commerce companies active in the fast changing environment, such as time to market, customer demands and increasingly complex and technically advanced products and the continuously growing international competition force companies to employ project management (Cleland, 2006). In the nowadays business a project manager plays the governance role. He creates the plan, is responsible for efficient resource usage, tracks the progress and adds value when the goal is achieved. In other words the value of the project managers to the organization is their ability to effectively manage the competing demands of time, cost, scope, resources, risk and quality (Bridges et al, 2013)

The PMBOK Guide defines Project Management as set of 5 process groups, which are interlinked and interdependent. Each Project begins with preparation of documents and assignment of project manager. These steps take place in the Project initiation phase. Followed by Project planning, process involving scheduling and evaluating of various tasks. Project execution involves working with team members, directing them and managing their work, while Project control deals with variance analysis and necessary adjustments. Last but not least, the project closure process verifies the work done and finalizes paperwork, Figure 4 (PMBOK, 2009).

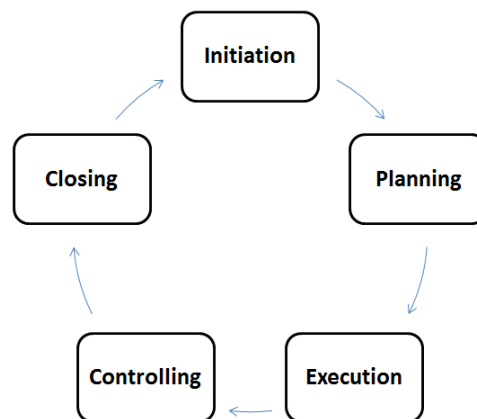


Figure 4: Project Management Process (PMBOK, 2009)

Project management became a formal discipline of management in the mid-20th century with the introduction of the first program evaluation and review technique, known as PERT (Shenhar et al, 2004).

In the mid-1990s, project management began to grow and become stronger through the initiatives of standardization and certification programs (Crawford, 2006). Project management began to branch out from the primarily engineering sectors into other disciplines such as IT, business and education. In their study Cicmil and Hodgson (2006) aimed at new trajectories in the field of projects, project performance and project management. Authors analysed the practical use of project management, starting from the Manhattan project in the 1940's, through post-World War II technology and infrastructure development. They observed that the transformation of project management from engineering sectors happened due to awakening of public sector clients, including government agencies that were looking for management models and procedures to minimize budget expenses and time overruns associated with project work delivered by contractors. Cicmil and Hodgson rightly highlighted, that development of computer-based technology resulted in the creation and promotion of sophisticated expert systems for project planning and control but also through increased usage of communication technologies (Cicmil et al, 2006).

Business is becoming increasingly project focused and global spending on projects absorbs many billions of dollars annually. In spite of advances in the project management discipline and profession, the common experience suggests that many projects fail (Williams, 2005). The author suggests that for projects that are complex, uncertain and time-limited, conventional methods might be inappropriate and use of newer methodologies and techniques in which the project emerges might be more appropriate. In the light of his findings the importance of improvement of processes in the field of project management is seen as crucial from the performance point of view.

### 2.3 Project Stakeholders

PMI defines project stakeholders as "individuals and organizations that are actively involved in the project, or whose interests may be affected as a result of project execution or project completion. They may also exert influence over the project's objectives and outcomes" (PMI, 2004).

For the purpose of this study following key stakeholders participating in projects were defined:

- a) Project sponsor,
- b) Project manager,
- c) Project customer,
- d) Project team member,
- e) Department manager,
- f) Contributor,
- g) Consultant,
- h) Other project staff.

Project team members are the individuals with a particular subject matter expertise who are assigned to specific work tasks, as distinguished from the project management team members who

are directly involved with project management activities, and as such their subject matter expertise is project management.

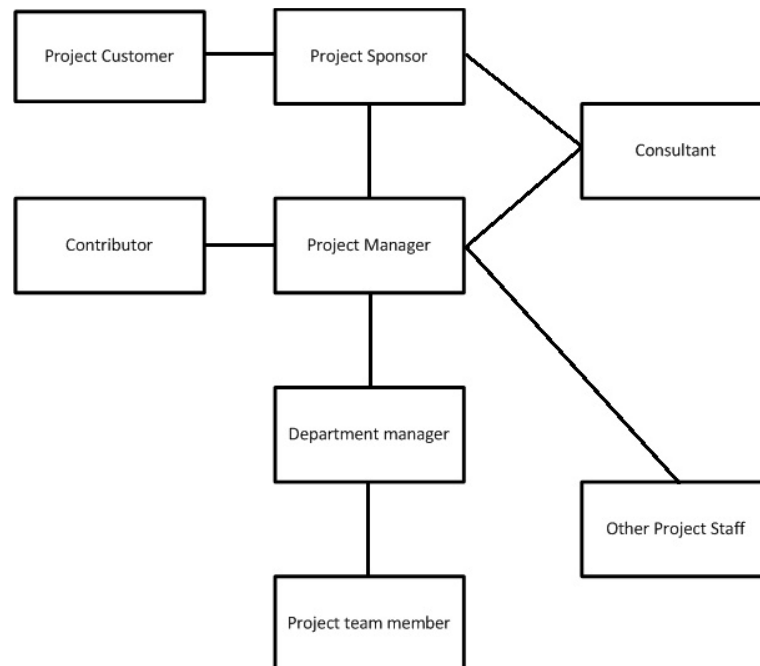


Figure 5: Project Team Structure (Source: Author)

In every project influence of all players is vital to the project success. Figure 5 presents a typical project team hierarchy and structure. Project sponsor being very often project customer<sup>90</sup> sets objectives, accepts consequences and earns the rewards, whereas project manager develops and executes plan, manages resources, monitors progress and delivers results. Contributors are people who have detailed knowledge of how business processes work (Frame, 2002).

## 2.4 Project Success

Successful projects contribute to organizations performance. However the review of literature provides no consistent interpretation of the “project success” terminology. Many authors discussed the topic, mostly building on the standard criteria: time, cost and performance. Those three criteria, particularly within project management disciplines are used to define project success. These include cost against budget, time relative to project schedule and performance against outcome requirements (Schwalbe, 2007). Benningson argued that several additional criteria, which are important, could be identified; these include customer satisfaction, but also follow up work and internal spinoff (Benningson, 1972). In order to achieve consistent positive outcomes, measure tools are required. Unfortunately because of the multidimensionality of individual projects success is difficult to measure.

The real questions to be asked in determining project success are: what factors are critical to project management success; what factors are critical to success on an individual project; and what factors lead to consistently successful projects. For that reasons a distinction between project product success and project management success is needed.

Baccarini (1999) distinguish between two components of project success: project management success and product success.

Whereas project product success is gauged on the extent that the overall project objectives are met, project management success is a function of the relative performance of the project processes in meeting cost, time and quality objectives (Cooke-Davies, 2002).

A study conducted by Dvir, Sadeh and Malach-Pines in 2006 researched the fit between project managers personality, style and the project type. In their work, authors indicate the fact that project differs in many important ways, and that it's a common mistake to think that one can use similar tools for all project activities. Managing projects with this attitude leads frequently to project failure and disappointment, because companies are using improper project management techniques and tools for many of their project efforts (Dvir, et al. 2006).

The researcher is convinced that there is a linkage between project type, management style and technological factors impacting project success. Different types of projects should be managed in different ways and it is project managers role to choose the proper tools. Through undertaking of this study, the researcher wants to investigate the literature gap and possibly cover it by defining technologies that influence project results.

The study will try to establish, how contemporary project managers and stakeholders understand the topic, what are the most common tools used and how they might affect the project success.

## **2.5 Technology in Project Management**

The evolution of data processing machines from scientific invention to practical business machines came into focus in the 1960s with many companies producing computers (Ceruzzi, 2003). It is now well known fact that contribution of information technology to economic growth and development is seen as an important factor underlying the pace of development in many countries.

Through the development of tools and software modern organizations were able to focus on how they could build or buy software to automate operations to enable growth, reduce operating costs and develop competitive advantage (Campbell-Kelly, 1995).

Most of the available project management software offers a broad range of detailed specific project tasks. The people in the project are only able to work on the project together if all have access to the software. This is especially important if they work in different units or different companies with different technical equipment and background. Especially nowadays for e-commerce teams working in distributed international teams, the quality of communication and collaboration is the critical factor for the success of the project (Quade, et al. 2012).

Many companies invest in technology to improve organizational performance to gain competitive advantage. Anantatmula and Kanungo concluded that technology systems must be developed to meet specific business and project needs. In essence, technology is crucial to improve processes; it helps to manage project complexity, utilization of resources and keeps projects integrated (Anantatmula, et al. 2005). Following from this study, the researcher concluded that use of technology such as cloud computing, knowledge sharing, video conferences, schedule planning and risk control tools, together with internet and intranet help project managers lead projects implemented, communicate more effectively and distribute tasks in a more efficient and effective manner. However the results of a study conducted by IBM in 2008 on “how organizations can manage change and identifies strategies for improving project outcomes” show that only 41% of projects met schedule, budget and quality goals, whereas nearly 60% have failed in meeting their objectives. According to the IBM study results 44% missed at least one success parameter while 15% either missed all goals or were cancelled in the beginning phase (IBM, 2008).

## 2.6 E-Commerce

The new economy concept came into being at the end of the 20th century when the background of the world economy was shared between two tendencies: globalization and the unprecedented dynamic of information and communications; this moment launched the so called knowledge revolution and indicated the change from the economy based on physical resources to that based on knowledge. These new structural changes in the world economy foreshadow a new industrial revolution that has the power to fundamentally change the entire social and economic life in the 21st century (Minculete, 2013).

In the past years, e-commerce the concept of buying and selling or exchanging products, services and information over the Internet, increased to one of the most important tools of modern business (Turban et al., 2002).

The use of the Internet in the world has increased almost fivefold since the year 2000, and in 2011 almost one-third of the world population had been using the Internet. With the evolution of World Wide Web, the concept of buying, selling or exchanging products, services and information over the



Internet became one of the most expanding fields in the contemporary business (Pabedinskaitė, 2012). Nowadays 34% of world population has access to the World Wide Web, North America, Australia and Europe are leading with 78%, 67% and 63% respectively (Internetworldstats, 2013). The global e-commerce sale passed \$1 trillion Dollars in 2012 for the first time ever and is expected to grow just above \$1.3 trillion in the current year (Mashable.com, 2013).

More consumers shifted spending from physical stores to retail websites thanks to lower prices, greater convenience, broader selection and richer product information.

Electronic commerce, as per definition, is a segment of a larger business model, which enables a firm or individual to conduct business over an electronic network, typically the Internet. E-commerce operates in all four of the major market segments: business-to-business, business-to-consumer, consumer-to-consumer and consumer-to-business (Investopedia, 2013).

The usage of e-commerce is not an end in and of itself. E-commerce is implemented to improve internal and external processes but also to help enter new markets. E-commerce has brought benefits to companies like cost saving, product promotion, timely information, reduced disbursement time, information consistency, greater customer service and customer relationships, products customization, competitive advantages and convenience of running business (Wen et al., 2001).

The Internet allows companies regardless of their size to operate their business on a wide scale. Any company can globally access areas that otherwise would have been difficult to access. This borderless business operation offers products to people who cannot find the products in their local region. Furthermore, Pallab claims that e-commerce firms will also extend their accessibility, as it allows a 24/7 operation and enables people to shop when it is convenient to them (Pallab, 1996). This enables to grow the market share, seizing revenue and gaining advantage over competitors.

E-commerce also enables a broader scope of segments as it increases advertising that can be seen by recipients worldwide. This allows global communication and products to people who cannot buy specific products in their local areas. As a result, the Internet permits organizations to be more productive, more efficient and more customer oriented.

### **2.6.1 E-Commerce in Ireland**

Ireland was described as the Celtic Tiger for its outstanding economic growth in recent years. Since the mid-1990s Ireland was the fastest growing OECD economy but currently struggling with one of the most severe recessions (OECD Observer, 2013). However the newspaper "The Irish Independent"

reports that Irish economy will grow faster than anywhere else in the euro zone according to the European Commission forecast in February 2013 and so will the e-commerce. "The Commission sees the euro zone economy growing 1.4 per cent in 2014, with a figure of -0.6 per cent for 2012" (Independent, 2013). These promising prognoses invite investments in the region, but also encourage existing companies to expand. The suggested topic of technological impact on project success is therefore even more interesting, as companies whose projects fail are experiencing losses what results in slower growth (Independent, 2013).

In the 90's Ireland has enjoyed an astonishing economic success. Through tight linkage with Europe and the World, series of national agreements on wages and taxes the country's economy has grown at an average rate of more than 7 per cent a year attracting foreign investments especially in areas of IT and Customer Services (Economist, 1997).

Regarding the nowadays high unemployment rate of young graduates in Europe, Ireland provides an attractive location for multinationals given its low corporate tax rate, well managed labour relations, and most importantly its English-speaking, young and vibrant work force. In addition, the Irish social culture contributes to an attractive business and work environment (Burns, 2000).

Ireland's ability to leverage its pool of multilingual graduates has made it an ideal place for headquarters localization by international software firms. The availability of a multilingual workforce and a modern telecommunications infrastructure has made Ireland an important location for international call centres, what makes a perfect environment for e-commerce companies. In recent years, Ireland has done much to improve its infrastructure by directing a large share of its allocation of EU structural and cohesion funds towards infrastructure modernization projects (Telecom Eireann, 1996).

Information and communication technologies are fundamentally changing the nature of business. Technological innovation such as e-commerce are becoming more and more diffuse among enterprises as the barriers are substantially lowered by lowering costs, open standards and more ubiquitous internet-based technology (Scupola, 2002). A study conducted in Ireland in 2006 by Kirwan & Conboy focused on Small and Medium Enterprises and explains how important e-commerce is for a retail company and what impact it has on economy of a region (Kirwan, et al, 2006). Authors indicate that adoption of e-commerce generates opportunities for a company creating efficiencies in communication, shifting trading power balance in its favour and creating new markets.

For the purpose of the study, the researcher will try to establish the relation of use of available technologically advanced tools and the size of the company. It is believed that the size of the firm positively relates with number of tools used in project management process and these impacts the results of companies' undertakings.

"Ireland has risen from fourth to six place in the EU in businesses using e-commerce for purchasing" (Irish Times, 2012) compared with the EU average of 49 per cent in 2011 over half (51%) of business in Ireland used electronic means to make a purchase." This put the State on a par with Germany and just behind the UK (53) reports the Irish times.

Research conducted by Irish Examiner in 2012 revealed that" 51 per cent of all Irish enterprises used e-commerce for making purchases in 2012, while 23 per cent used e-commerce for sales purposes. Those figures compare to EU averages of 34 per cent and 16 per cent respectively"(Irish Examiner, 2013). These numbers show how important e-commerce is for the Irish business.

### **2.6.2 Automation in Project Management**

The impact of technology is pervasive in nowadays marketplace. In manufacturing industries technology has gone beyond its role as a substitute for manpower to become a value-adding component of products. In the service sector technology has assumed a different role. It serves as a unique tool to improve the efficiency and effectiveness of companies, as well as to enhance their services (Khan, et al, 2002). Nowadays e-commerce focuses on automation and technology and relies on them in order to gain advantage in the changing online environment.

### **2.6.3 Technology in E-commerce**

Business software is an application software that can be used by people to make their performance in daily business activities more efficient and effective (Manzoor, 2012). Project Management same as other entities of nowadays business avails of large number of tools. Some of them include:

- resources estimation and planning tools,
- scheduling, cost control and budget management,
- resource allocation and collaboration software,
- communication,
- decision-making,
- quality management and
- documentation or administration systems.

The use of these and other tools is very often neglected as factor influencing the success of a project. The purpose of the study is to look for a correlation between use of available software, complexity of a project and its impact on general outcome.

Nowadays companies irrespective of their size, their market range use information systems and invest in information technology to achieve key business objectives such as improving the ability of company but also to improve competitiveness and to sustain it (Laudon, 2007). Internet, related technologies and applications should be changed in line with changes in business operations but also in line with changes in the way employees work. Information systems and their supportive role in business processes, decision-making and achieving competitive capabilities are recently becoming more and more common.

As per definition, the phrase e-commerce is used to describe business that is conducted electronically over the Internet using any of the applications that rely on it. E-mail, Instant messaging, shopping carts, Web services can be used between two businesses or business and a customer to transfer funds, goods, services or data.

### 2.7 Tools and software in Project Management

Advances in information technology accompanied the expansion of global business forces. This fact had an enormous impact on how nowadays business is done. Most significant were advances in telecommunications and computing and the intersection of these two technologies in the Internet (Frame, 2002).

With the rising complexity of projects the need to control and manage resources has risen.

For the purpose of this study, technological tools have been mentioned to denote communication tools, such as email, instant messengers or mobile phones, but also scheduling and budgeting tools, data storage and cloud computing, allowing project managers to access information anytime, from anywhere in the world.

Following have been considered:

- a) Email
- b) Cloud computing / Shared drives
- c) MS Office Pack (Visio, Project, PowerPoint, Outlook) or similar
- d) Instant Messenger / Skype / Lotus Notes / Other
- e) Mobile phone / Smart phone / BlackBerry
- f) Social Media (Facebook/Twitter/other)
- g) Personal conversation / meeting / conference call
- h) Cross collaboration tools – Ralley (scrum based)

In the IT industry, Gartner Research estimates that 75% of large IT projects managed with the support of a project management information system will succeed, while 75% of projects without such support will fail. Authors conclude that collaboration of interactive planning and processes

prioritization between company entities is likely to have above-average profit margins and indicate that effective project management should actively be engaged with stakeholders in order to increase the success of projects undertaken in their companies (Light, et al 2005).

### 3 Research Methodology

#### 3.1 Introduction

Secondary data was reviewed to find correlation between the main three areas for project management: cost, time and quality. However, those three components have to be linked by technology in order to gain effectiveness and success. A correspondent outcome was underpinned by the IBM study which revealed that managing those three components requires a synergy between people and technology. Although the IBM study focused more on the people component in this synergy this research will accomplish the framework by figuring out the impact of technology and its appropriate use of it for achieving project success (IBM, 2008).

Beyond those secondary data on technology in project management no interdependence or recommendations on appropriate technology usage in project management enclosing those aspects was provided. Literature states little on recommendations on technology application in modern project management which is a relative aspect but crucial for success.

The purpose of the study is to measure the effectiveness and impact technology has on project managers work, through analysis and examination of tools used by project managers and by trying to establish the influence of modern tools on project success or failure.

Nowadays in times of e-commerce and globalization the communication and planning together with technical tools and software are crucial to a projects success and therefore finally to company's competitiveness. However practice shows that e-commerce companies located in Ireland achieve global competitiveness and therefore apply technology appropriately for a successful project outcome.

Main examples of companies this research is based on are: DropBox Inc., eBay Inc., Facebook Inc., Google Inc., IBM Corp., LinkedIn Inc., PayPal Corp. and Salesforce Corp. Those companies will be illustrating the way of implementing appropriately technology in project management. These ecommerce organizations show through their market shares and revenues their worldwide competitiveness. Their massive global growth and on-going new product innovation requires a reliable strategic project management of which one of the main crucial basis is technology usage. The aim of this research is to close the gap between secondary data and practice primary data results in the formulation of the following thesis. This lead to the primary research question:

"How does appropriate use of communications technology influences project success?"

### 3.2 Methodology Approach

In order to better facilitate this process, the researcher applied the Saunders et al. (2008) 'onion' model, Figure 6. It represents the stages of the research methodology and the researcher is convinced that adaptation of this model will provide necessary structure in approaching the research and addressing the hypothesis.

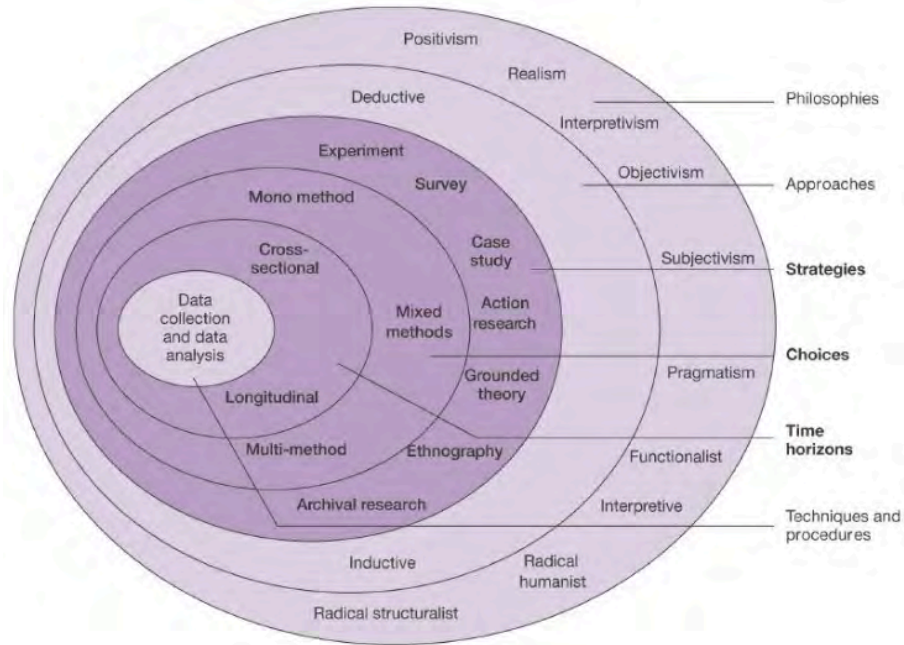


Figure 6: The research Onion (Saunders et al. 2008)

The research methodology constitutes the path to finding the answers to the research questions asked. It explains the process and points out steps needed for a successful research (Kumar, 2005). Following steps in research process are considered crucial:

1. Formulating the Research Problem
2. Extensive Literature Review
3. Developing the objectives
4. Preparing the Research Design including Sample Design
5. Collecting the Data
6. Analysis of Data
7. Interpretation of Collected Data
8. Conclusions reached.

Research is an essential and powerful tool in leading man towards progress (Gupta, 2011). The dictionary defines research as the systematic investigation into a subject and study of materials and sources in order to establish facts and reach new conclusions (Oxford Dictionaries, 2013).

Research work must involve theories and informs about the researchers approach taken in designing the research (Sounders et al, 2007). There are two distinct approaches to research; deductive and inductive reasoning. For the purpose of this study the deductive approach has been used.

### **3.2.1 Research Objective**

The research has attempted to show the connection between use of communication, planning and data storing tools and techniques as well as employment of collaborative tools while managing projects in companies of different sizes and its influence and impact on the success of the undertakings.

The research model planned to assess the range of usage of available project management tools and techniques by project staff and its further impact on the outcome of the undertaking. The researcher assumed that software functionality, project managers experience and project complexity have positive impact on project success in e-commerce environment.

Additionally the researcher was interested in establishing the correlation between the use of technology experience of project managers involved in projects and the success rate in undertaken projects.

### **3.2.2 Research Hypothesis**

A hypothesis can be a statement about the relationship between two variables; the independent one and the dependent variable (Collis et al 2003) According to Walliman hypothesis are “reasonable guesses made in the form of statements about a case or situation” (Walliman, 2005).

Using the quantitative research method this research plans to explore the impact tools and software used in the process of managing a project has on the success of a project.

The hypothesis helps the researcher to interpret the problem and main purpose of the research and guide him through the process into a clear explanation of the expected outcomes.

The following three major research hypotheses have been proposed:

H1 – Use of the available software will be positively related to project success

H2 – The project success will be related to experience of a project manager and his education level



H3 – Level of project manager’s experience has a positive relationship with application of technology and its use in projects

The main purpose of the research hypothesis is to help the researcher find the solution to the research problem and guide him on the way.

### 3.2.3 Research Question

In order to complete a successful research a clear conclusions had to be drawn from the collected data. The research questions related to an existing practical business problem which requires conceptual clarity in order to develop a theory (Saunders et al, 2007).

The research done by IBM in 2008, based on hands-on experience, investigated on 1500 practitioners from 15 countries, active in 21 different industries. In the IBM study project leaders responsible for a wide range of projects, including small and large scale undertakings, were tested on objectives that included: customer satisfaction improvement, sales and revenue growth, cost reduction, process innovation, technology implementation, new market entry and organizational change. On average 40% of project fail, either through missing timeframes, going over budget or not satisfying customer needs. The results indicated that customer satisfaction improvement, sales and revenue growth, cost reduction, process innovation, technology implementation, new market entry and organizational change, together can lead to delivering more successful projects (IBM, 2008).

Therefore the researcher is convinced that it is important to investigate for the reason that hides behind these results, and to search for the possibilities to improve the failure rate in the future.

It is hoped that results of the study will help improving the successful rate of projects undertaken in the e-commerce sector.

With this paper the researcher derives following research questions:

#### **Research Question 1:**

“What is the impact of software application on the outcome of the project and is it dependent on company size?”

#### **Research Question 2:**

“How does the experience of a project stakeholder influence the outcome of the undertaken project?”

### Research Question 3:

“How does the experience of a project stakeholder impact the use of the available tools in project work?”

### 3.3 Research Method

Research is commonly characterized as being either quantitative or qualitative or a mixture of both (Leedy et al, 2005). While quantitative research relies on the collection of numeric data, the qualitative approach relies on the collection of data such as words and pictures. The mixed research involves the mixing of both methods in proportions dependable on research questions and the situational and practical issues facing the researcher. All three approaches are important as they attempt to solve the manifold and complex problems the researcher is embracing (Johnson et al, 2007).

Business research is the application of the scientific method in searching for the truth about the business phenomena. The process includes idea and theory development, problem definition, searching for and collecting information, analysing data and communicating the findings and their implications (Zikmund, 2012).

The structure planned for the means of this study was constructed based on the research onion systematic (Saunders, 2008) and is structured as shown in Table 1:

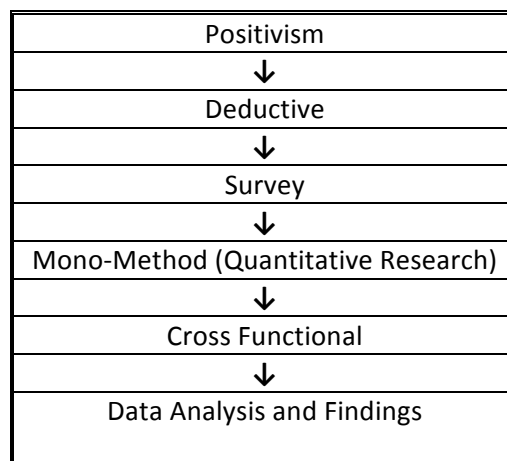


Table 1: Research Structure

#### 3.3.1 Positivism

The positivist approach prefers working with an observable social reality. The positivist researcher prefers highly structured, replicated research that can provide factual data (Saunders 2006). This method has to be applied as this study requires data collection from a large group of population and the researcher wants to achieve high grade of replication.

Positivism is an attempt to engage scientific methods with social science and is usually used in quantitative data collection (Williamson, 2002). Research based on this approach will result in findings that are law-like generalizations defined as “a pattern or regularity that repeats over different circumstances and that can be described simply by mathematical, graphic or symbolic methods. A pattern that repeats but need not be universal over all circumstances” (Bass, 1995).

### **3.3.2 Deductive**

Deductive research develops theories and hypotheses and then tests out these theories through empirical observation. It is essentially a set of techniques for applying theories in the hands-on environment in order to test and assess their validity. Essentially the process of deductive research is as Saunders points out ‘the development of a theory that is subjected to rigorous test’. Deductive research is the most widely used approach in the natural sciences (Saunders et al, 2003).

In his study the researcher employed the positivism approach and through deductive approach tested the validity of the research questions. The presented study aimed to collect data from the population of project managers and project related stakeholders across the e-commerce companies located in Dublin, Ireland.

### **3.3.4 Survey**

The researcher developed a questionnaire based on information collected in the secondary research focusing on the areas interesting for the research question. The survey served as a primary source of data for the presented research.

There are many available ways to collect data using surveys; some of them include use of telephone, email, post and in person interviews. For the purpose of presented study the questionnaire was distributed electronically via email and online survey application tool but also through use of social media. For the need of the study the researcher used software available at [www.smart-survey.co.uk](http://www.smart-survey.co.uk). As the study focuses on the Irish located e-commerce companies and their location is mostly in Dublin, Ireland there should be only few limitations in accessing the respondents. The survey has helped to prove the hypothesis through review and analysis of collected data.

The survey consists of questions with pre given multiple choice answer options. This way the researcher has reduced discrepancies and could determine the relationships between project complexities, tools used and project success. Each participant has been asked to rate the impact of used tools on work done on the project (See Appendix 10.1, Page 80)

### **3.3.5 Quantitative Research**

Quantitative studies are intended to count and otherwise measure many instances of a few variables and through statistical inference techniques to mathematically describe the likelihood of something occurring based on a set of criteria (Leedy et al, 2005).

This method is applied in order to gather numerical data and to establish relationships between variables in the research (Bryman, 2007).

For the purpose of this study a single data collection technique also called the Quantitative Mono Method has been chosen and is considered most appropriate.

The researcher used a survey questionnaire in order to get the wide view on the topic. Because a high number of participants is required the quantitative research method was considered most suitable, allowing testing the influence of different variables on each other. Additionally the questionnaire method guarantees anonymity of the participants.

### **3.3.6 Qualitative Research**

Qualitative research is a process data collection that focuses on discovering the meaning and interpretations of social phenomena. It focuses on obtaining opinions and attitudes mainly through focus groups and personal interviews. It describes experiences and collects data in a non-numerical form such as words and pictures (Sale, 2008).

Using this approach research would require to ask open-ended questions through interviews and focus groups and collecting behavioural aspects such as experiences, emotions and personal opinions.

For the purpose of this study the researcher decided to revoke the use of qualitative data collection being convinced that questionnaire form will allow gaining access to wider group of respondents.

### **3.3.7 Cross Sectional**

Cross sectional approach is used to present a snapshot of data collected at a particular point in time. This method often applies the use of survey as primary data collection tool (Saunders et al, 2007).

The survey for this study has been distributed among respondents involved in the project environment on different levels. Research has narrowed down the respondents to only several interesting from the project point of view stakeholder groups such as project managers and project sponsors, but did also look at the view of respondents involved in operational side of the projects including project contributors, consultants, department managers as well as regular project team members.

The researcher hopes to get objective view on the investigated topic.

### 3.4 Sample

Sampling is the process of selection of a number of individuals from a specific group for the purpose of data collection in order to obtain the general view of larger population (Williamson, 2002). This had to be done as it is not possible to collect information from the entire population due to time constraints and limited resources. The researcher had to focus on elements from the general group in order to draw conclusions (Bryman, 2007).

In order to collect data for the study, the non-probability research sample has been chosen as most applicable. A combination of convenience sampling and snow-ball sampling methods has allowed access to wider group of respondents. To ensure consistency of measure and the highest possible reliability coefficient the same research questionnaire was emailed to all potential respondents. The researcher expects to reach a minimum of 80 responses. The research will use the analysis of variance in order to perform further analysis on the systematic factors that are statistically contributing to the data variability.

Data for the study has been collected in timeframe between June and July 2013 in order to allow the researcher summary and data analysis and completion of the assignment in time. A combination of convenience and snowball sampling methods has been used. This method improves research results through referrals made by people asked to fill the survey. It is well suited when the focus of a study is on a sensitive issue and requires knowledge of insiders to locate people for the study (Biernacki et al, 1981).

The research population for the quantitative research presented in this study consisted of project staff, project managers, sponsors and other stakeholders involved in project activities which have been chosen as explained in the above chapter in order to represent an objective, descriptive data set for this study.

Using personal contacts and the snow-ball sampling technique the researcher targeted 150 respondents from e-commerce companies located in Dublin, Ireland, including DropBox Inc., eBay Inc., Facebook Inc., Google Inc., IBM Corp., LinkedIn Inc., PayPal Corp. and Salesforce Corp.

The sample was not representative of the Irish e-commerce market as a whole particularly in terms of company size and industry. The presented study focused mainly on large companies in the Dublin, Ireland area and above 70% of responses came from stakeholders active in companies hiring above 600 employees (Table 3, Page 45).

### 3.5 Time Horizon

Cross-sectional studies are often used in connection with the survey strategy. They investigate a particular phenomenon at a particular time (Saunders et al, 2009).

The cross sectional design is often called a social survey design as it “entails the collection of data on more than one case and at a single point in time in order to collect a body of quantitative or quantifiable data with connection with two or more variables which are then examined to detect patterns of association” (Bryman, 2007).

The data presented in this paper has been collected via online survey tool in the month of June 2013.

In the presented paper the researcher had to test the suggested research question, prepare the summary and data findings reaching the research objective. The Dublin Business School has specified a timeframe of eight months for the purpose of the dissertation.

### 3.6 Primary Data Collection and Analysis

The primary data defined by Kothari (2009) are the data, which are collected afresh and for the first time and thus happen to be original in character. For the purpose of this study a self-administered questionnaire will be used (see Appendix 10.1, Page 80). The researcher made every effort to assure that the collection of data was accomplished ethically and the participants privacy was respected. All data and information gathered or created for the purpose of this study was archived to digital media and stored securely.

With a focus on e-commerce active in Dublin, Ireland an online survey was chosen as the best means of survey distribution. This option enabled simple and fast creation of the survey and enabled the ability to reach the largest amount of relevant potential participants. Use of this tool also allowed the collection and recording of responses in real time and the ability to export data in different formats for analysis.

The purpose of data analysis is to extract the meaning from the data collected and present it in an understandable form (Kwale et al, 2008). The raw data from the questionnaire was partly analysed through the research program SPSS Statistics, which is a computer application providing statistical analysis of data. SPSS Statistics allows in-depth data penetration, analytical reports, graphics and modelling. For the data analysis the researcher used also online survey software available with the survey tool [www.smart-survey.co.uk](http://www.smart-survey.co.uk). In addition the researcher used Microsoft Excel software to get valued information and statistics.

### 3.7 Secondary Data Collection

For the purpose of this study secondary data was collected and included data that was already published. While preparing the literature review the researcher has been supported with secondary literature sources outlined by Saunders that included various literature; books, journals, magazines and electronic resources (Saunders et al, 2009). All of the used resources were properly referenced using the Harvard Referencing System.

Beyond theoretical secondary data frameworks the researcher implemented an IBM field study publication on project outcome improvement in order to link theories to real business environment and detect gaps in this area.

### 3.8 Questionnaire

As defined by Hair, “a questionnaire is a predetermined set of question designed to capture data from respondents” (Hair et al, 2003). In this study, a written questionnaire will be considered more appropriate to help in triangulating the research data from survey results. Triangulation ensures “that the data are telling you what you think they are telling to you” (Saunders et al. 2003). The majority of the questions will be designed or refined in the form of closed multiple choice questions. Hair (2003) recommends also that the general design of the questionnaire should be consistent to avoid confusion and to ensure accuracy of the data.

Therefore most of the questions were statements and all participants had to fill out the same questionnaire and all of the questions were provided with the possible responses indicated on 1- to 5 point rating scale whether they strongly agree, agree, disagree or strongly disagree to each of the statements (Tashakkori et al, 2002). Prior to the issue of the questionnaire the multiple choice questions were pre-coded and different weights allocated to identify various responses categories for ease of recording of the findings and conducting the analysis.

The researcher also performed a pilot to the questionnaire as well as referring it to the dissertation supervisor to enable clarification of questions before sending it out and to minimize any possible errors. To mitigate the weaknesses of non-responses, loss of control and slow responses, Hair suggests that the researcher should make preliminary contacts, provide responses deadline and send follow-up reminders (Hair et al, 2003). The initial contacts have been asked to circulate the questionnaire to a maximum number of project staff members and in some cases provided a list of respondents that could be used by the researcher to send the questionnaire directly. In order to increase the response rate, the researcher intended on using an approach suggested by Lehmann et al, (1998), called “drop off, call back” in regard to suggested respondents. In this approach the

researcher drops-off some questionnaire to identified respondents and then returns to pick them up at an agreed later stage.

### **3.9 Ethics**

There are many ethical issues to be taken into serious consideration for research.

There has been a real change in the last 10 years in people talking more frequently and more openly about ethical dilemmas of all sorts and nowadays researchers face an array of ethical requirements. They must meet professional, institutional and federal standards for conducting research with human participants. This study will follow the key principles of ethical research.

Research has been designed, reviewed and undertaken to ensure integrity, quality and transparency. The identity of all participants of the survey as well as all feedback received has been kept confidential and used only for the purpose of the study. All data collected will be kept anonymously and password protected. After the accomplishment of the study all of the confidential documentation will be disposed of properly. All participants of the survey have been briefly informed about the purpose of the research, taking part has been on a voluntarily basis, free from any coercion and confidentiality and timeframes. The way the collected data might be stored has been clearly presented (see Appendix 10.2, Page 83). This has been done to protect certain elements of the study and guarantee positive relationship between both parties; the researcher and the respondent (Saunders et al, 2009).

### **3.10 Researcher Bias**

Bias is defined as any tendency which prevents unprejudiced consideration of a question (Dictionary.com, 2013). In research bias occurs when “systematic error is introduced into sampling or testing by selecting or encouraging one outcome or answer over others”. Through questionnaire design the researcher hoped to achieve non-biased, general view on the researched topic.

The researcher feared bias in the study design, which could emerge through improper study creation and wrong questions selection. A risk in selection bias is also taken into consideration. Participants of the study should originate from the same population; nonetheless the use of the snow-ball method might have pushed the study of the track, as snowball sampling relies on referrals from initial subjects to generate additional subjects.



### 3.11 Limitations

The research of the technological impact on project success or failure concentrates and targets e-commerce companies located in Dublin, Ireland. Although the research has been prepared thoroughly, the researcher is aware of unavoidable limitations and shortcomings.

Firstly the survey has been conducted in short time frame and on small group of respondent working in a fast pace environment. Extension of data collection time could have guaranteed even distribution of responses from different levels of project environment.

Secondly the respondents busy schedules might affect the quality of responses, what to some extent might affect the results and did require additional efforts in order to get required responses in time and expected quality.

In addition, since the assessment of the results has been conducted by the researcher himself, it is unavoidable that in this study certain degree of subjectivity might be found mainly due to researchers background and personal involvement and engagement in the project environment of a large e commerce company located in Dublin, Ireland.

The survey has been conducted through the mono method and will be distributed with use of email, web based surveying tools ([www.smart-survey.co.uk](http://www.smart-survey.co.uk)), social media and in form of traditional printouts.

In order to guarantee higher response rate, respondents where applicable have been notified about the survey prior to receiving it.

The respondents demographic has been concentrated on project involved personnel active in the e-commerce companies located in Dublin, Ireland and the researcher hoped to gain access to various project managers of at least five different companies. The reason was to obtain wide perspective on the researched topic in order to be able to differentiate the results and gain clear picture of the current perception of the topic.

Because this project has been conducted independently there was no funding behind the project to develop the necessary amount of interest and authority. Due to the researcher's schedule there were also time constraints to develop the survey as well as gather and analyse the responses.

### 3.12 Assumption to Research

A number of studies have been completed that look into the success / failure rates of projects. These studies indicate that serious problems exist across a broad cross-section of industries.

71 per cent of IT projects are either outright failures or are only partially successful: 18 per cent are either cancelled outright or deliver no value to the business, while 53 per cent of IT projects are late, over budget or only deliver a portion of the expected features and functionality. As a result, organizations are spending about \$55 billion annually on cancelled projects and cost overruns (Inc.com, 2013). In correlation with a study conducted by Guardian showing that government projects reveals \$4billion in wasted efforts as a result of failed projects, the researcher finds it very important to search for improvement in the field Guardian (2008).

The results from numerous studies, the review of available literature and observation of the project management environment indicate huge need of improvement in utilization of available technical tools.

Through results of this study the researcher will investigate if there is a relationship between available tools and success of undertaken projects and how the success rate can be improved.

## 4 Data Analysis and Findings

### 4.1 Analysis

Globalization and the internationalization of markets have increased competitive pressures on business enterprises. In order to compete successfully in nowadays global markets companies need to continuously invest in new products and conquer new markets, which is mostly brought to life through projects. This has led companies to engage in projects that are critical to their performance, if not their survival. These projects, common in industries such as engineering services and information technology have one thing in common: they need to be managed which means they need to be planned, staffed, organized, monitored, controlled and evaluated (Liberatore et al, 2003).

#### 4.1.1 Research Environment

The literature review showed that e-commerce environment in Ireland is one of the fastest growing industries in Europe due to conditions explained in chapter 2.6.1 E-commerce in Ireland. Globally operating companies settle their headquarters in Ireland mostly due to location economies. As Cleeland and others stated in chapter 2.2 Project Management that competitive e-commerce companies are dependent on project management due to fast changing business environment, customer demands and vast advancing technologies; project success is a crucial factor for existence of nowadays companies.

The research was carried out amongst large e-commerce companies considered as global players in the e-commerce business based in Dublin, Ireland listed below. However vast majority of responses came from companies employing over 600 employees (see Table 2, Page 44, answered by 70% of respondents).

- DropBox Inc.
- eBay Inc.
- Facebook Inc.
- Google Inc.
- IBM Corp.
- LinkedIn Inc.
- PayPal Corp.
- Salesforce Corp.

All the above listed companies are connected through a common business structure and are major players in the global Internet based industry. Those companies provide e-commerce platform accessible worldwide, offering mainly social, trade and financial services which is displayed in the industry overview outlined by question one (Table 2, Page 44). As outlined in chapter 2.6 E-commerce it is not only crucial but their reason of being, in order to exist in the World Wide Web.

As mentioned in chapter 2.2 Project Management chapter; In order to be successful in the changing environment, to enter new markets and introduce new products to the market place successfully companies active in the e-commerce sector rely strongly on projects and project management.

The findings contained in this study resulted from the descriptive correlation and stepwise multiple regression analyses performed on responses provided by 81 individuals who are active in the project environment of large e-commerce company located in Dublin, Ireland.

The instrument used for data collection was a survey comprised of 14 closed questions. In the questions participants were asked to describe the industry that they are involved in, rate their experience and role they play in projects as well as mention current position in the company.

Within the 14 questions respondents were also asked to describe their confidence with modern tools, rate the use of these in projects and reflect on effectiveness of their usage. Additionally the survey asked participants to describe the degree of project success that occurred with regard to meeting intended goals; budget, schedule and scope.

Using personal contacts and the snow-ball sampling technique the researcher targeted 150 respondents from e-commerce companies located in Dublin, Ireland. The questionnaires were sent directly to the respondents via email and social media.

Descriptive analyses were conducted to clarify the nature of the sample and distribution of responses. Correlation techniques were applied to determine the strength and direction found within any relationships between effectiveness of tools used and their outcomes on projects, surveyed the experience and most effective tools utilized in project work.

Creswell defined descriptive statistics as presenting “information that helps a researcher describe responses to each question in a database as well as determine overall trends and the distribution of the data” (Creswell, 2005). The researcher applied the online survey smart-sruvey.co.uk tool together with MS Excel and SPSS Statistic software to process the survey response information into graphically displayed data.

#### **4.1.2 Data Collection Process**

The results from the study were collected in three phases. In the first phase surveys were distributed among the closed group of researchers work colleagues. The pilot group provided feedback on survey form, its functionality as well as overall comments. The feedback was used to improve the layout and modify sections and question formulations.

In the second stage the survey was deployed via email to 150 project stakeholders from companies in Dublin, Ireland, including: DropBox Inc., eBay Inc., Facebook Inc., Google Inc., IBM Corp., LinkedIn Inc., PayPal Corp. and Salesforce Corp.

In the third phase the reminder email informing about the survey was redistributed together with an active promotion via LinkedIn.

In total 81 respondents completed the form, 3 of them left some questions of the questionnaire unanswered. This is all in all a satisfactory and sufficient respond rate in order to deduct analysis and conclusion for the research questions.

#### **4.1.3 Demographic Sample**

The survey respondents were project managers, contributors and consultants along with other stakeholders involved in projects in e-commerce companies located in Dublin, Ireland.

Out of the sample of 150 chosen respondents only 52% replied to the survey by filling majority of the survey questions. The achieved response rate of 60% was expected however the achieved score was in researchers opinion adequate and represented a sample sufficient to conduct the research.

The researcher did not distinguish between gender and age of the respondents but rather focused on current company position and role played in projects undertaken in respondents companies. This approach was considered appropriate as the researcher was concentrated on the practical use of tool in projects rather than on fragmentation of the sample.

The frequency distribution of study participants showed that every researched category has been represented. Out of all the 81 respondents banking and IT/communications employees were categories represented by 36 (44%) and 18 (22%) specialists respectively. Social media sector was represented with 15 respondents (18%), while engineering/ software development represented almost 4% of collected surveys. The 9 respondents identified as "Other" were according to research data stakeholders involved in projects as non-company related contributors or consultants working for the project externally.

Table 2 presented below indicates the exact numbers and percentages.

**Q1.Which category describes your industry?**

	Frequency	Percent	Valid Percent
Banking	36	44.4	44.4
IT/communications/ high tech	18	22.2	22.2
Social media	15	18.5	18.5
Engineering / software development	3	3.7	3.7
Other	9	11.1	11.1
Total	81	100.0	100.0

Table 2: Question 1: Industry description (Source: Author)

Information about the organization size was collected based on approximate number of employees hired at the moment of the study. The survey asked the respondent to qualify the size of the company they are engaged with. Represented in Table 3 are replies to the question asking for the number of employees in the organisation (Question 2). As the presented study targeted mainly large e-commerce companies located in Dublin, Ireland considered as main players in the business ,as expected the majority of replies came from companies hiring more than 600 employees, contributing to the results with 70% of responses. Smaller e-commerce firms with 100-300 and below 100 employees received 11% replies, while 3 respondents qualified their company to the 300-600 range and same number skipped this question.

**Q2.What is the number of employees in your organization?**

	Frequency	Per cent	Valid Per cent	Cumulative Per cent
Less than 100	9	11.1	11.1	100.0
100 _ 300	9	11.1	11.1	14.8
300 _ 600	3	3.7	3.7	18.5
600 and more	57	70.4	70.4	88.9
-	3	3.7	3.7	3.7
Total	81	100.0	100.0	

Table 3: Question 2: Respondents company size -by employee number (Source: Author)

Results for demographic data researching current work position amongst the participants show diversity across the categories measured. Although replies were not evenly balanced all groups were represented with a representative sample. Out of the 81 responses received, most common responses came from employees working in middle management positions 29%, followed by professional staff with responses slightly below 26%. Upper management, contractors and lower management constituted 11% and 7% respectively. Table 4 presents the graphic distribution of survey replies.

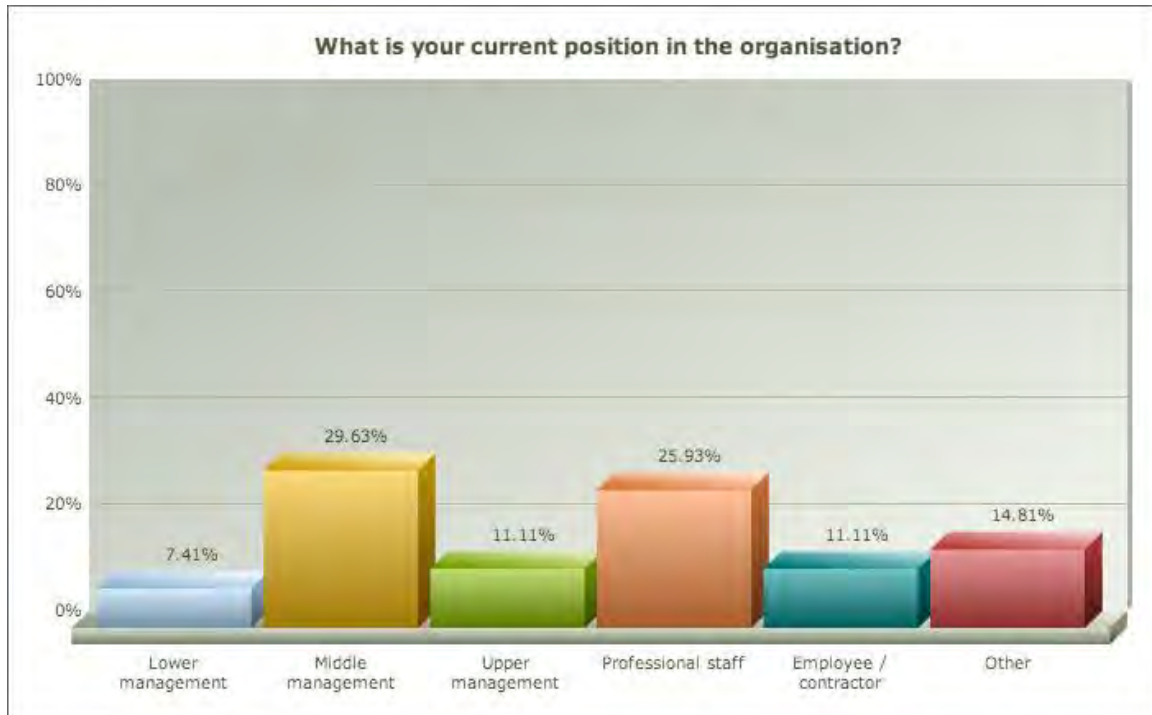


Table 4: Question 6: Respondents current company position (Source: Author)

#### 4.1.4 Project Stakeholders

Project managers are ultimately responsible for making sure projects are completed on time, on budget and within the features and functionality specified by the project sponsors. In order to accomplish their tasks the work is distributed among other team members in a project team.

From the stakeholders experience point of view the majority of respondents were competent professionals, involved for five or more years in the project environment representing 37% of the population. Second strongest group with 29% of responses came from stakeholders with experience varying between one and three years. Respondents with short, less than one year and medium three to five years project expertise constituted of 15% equally. For exact numbers please refer to Appendix 10.3 on page 84.

Analysing responses the researcher was interested in the correlation between experience of the project team member and the number of people involved in a team. In researcher opinion this factor is important and can have significant impact on the success. Work distribution, idea generation and internal team communication all rely on the size of the project team. The complexity grows with the team size and only through utilisation of acquired skills and knowledge of project manager the balance can be maintained.

Examining the dimensions of project experience and the sizes of project teams the trend shows that stakeholders with experience reaching over five years as well as ones with experience under one

year constituted the majority of respondents representing 52% of the sample working with smaller groups counting up to 10 members. Next in line with 27 responses are stakeholders involved in groups varying between 10-20 members. Here the strongest group was represented by specialists with 1 – 3 years of practical experience. Project teams counting 20 to 50 members represented only 11% of the whole population and involved stakeholders with middle and high experience only, while large projects teams were represented by team members whose experience exceeded 5 years demonstrating that complexity of a project requires knowledge and practical experience. See Table 5 and 6 for exact results.

**Q2.What is the number of employees in your organization?**

**Q3.How long is your project experience?**

**Cross tabulation**

		Q3.How long is your project experience?					Total
		< 1 year	1 – 3 years	3 - 5 years	5 years +	-	
Q2.	Less than 100	3	0	0	6	0	9
	100 _ 300	0	6	0	3	0	9
	300 _ 600	0	0	0	3	0	3
	600 and more	9	18	12	15	3	57
	-	0	0	0	3	0	3
Total		12	24	12	30	3	81

Table 5: Experience and company size (Source: Author)

**Q3.How long is your project experience?**

**Q7.What is the number of people involved in a project team?**

**Cross tabulation**

		Q7.What is the number of people involved in a project team?				Total
		< 10	10 - 20	20 - 50	50 >	
Q3.	Under 1 year	12	0	0	0	12
	1-3 years	9	15	0	0	24
	3-5 years	3	6	3	0	12
	5 years +	15	6	6	3	30
	-	3	0	0	0	3
Total		42	27	9	3	81

Table 6: Experience and Team size (Source: Author)

Looking at the results presented in the Table 5, 30 of respondents representing 37% of the population are involved in projects for five years and more. The majority of this group is working with small project groups not extending 10 members which is constituting 18% of the whole sample. Second strongest group of respondents are stakeholders with 1-3 years of experience with nearly



30% from total of 81 respondents. This group is involved in groups counting between 10 and 20 members (18%) but also teams smaller than 10 players (11%). 3 respondents of the study skipped that question.

Being interested how experience impacts the team work the researcher collated questions measuring project experience (Question 3) and average team size (Question 7). The cross correlation of results shows that majority of projects executed in e-commerce companies located in Dublin, Ireland (85% of respondents) is working in small to middle teams counting not more than 20 members. This fact reflects positively on the responses to question 13 surveying outcomes of recently completed projects, showing that strong majority of projects finished successfully. The respondents indicated that on average 85% completed successfully satisfying the basic project needs, namely meeting the project scope 80%, being ahead of schedule 44% and not expanding the planned budget 41% (Appendix 10.9, Page 88). These results are also in line with the Gartner Research mentioned in chapter “Technology in Project Management” which estimates that 75% of large IT projects managed with the support of a project management information system will succeed (Light, et al 2005).

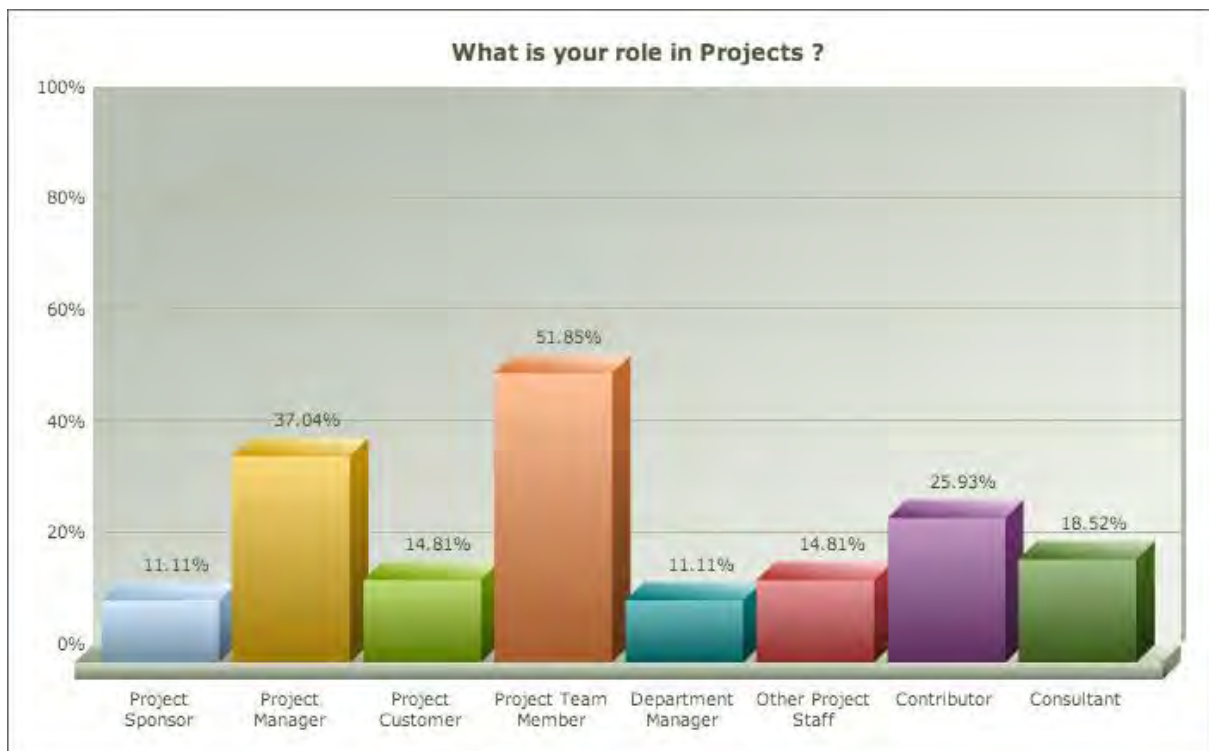


Table 7: Question 7: Project team size (Source: Author)

Table 7 represents the distribution of replies in relation to size of teams respondents are involved in. The majority of respondents stated that their teams are not bigger than 10 members; barely 4% stated that their teams consisted of more than 50 people.

Because team members can play various roles in the projects the survey allowed the respondents to choose more than one option in the question 4 asking for the current role the surveyed has in his organization. In many cases a project sponsor can be the project customer as well as project manager can be a department manager in one role. Table 8 represents a graphic summary of responses showing that the respondents are representing a sample consisting of variety of stakeholders. 42 respondents (51%) stated they play team member role, while 30 respondents admitted to work as project managers (37%). Project contributors represented third strongest group with 21 replies (26%) followed by consultant roles with 15 votes (18%).

When analysed the responses to question 5 asking for educational background only 27% of respondents admitted having been certified in the area of Project Management, either by successful completion of PMP course, CAPM training, or similar, or simply by graduating education in that area.



**Table 8: Question 4: Respondents role in project (Source: Author)**

These results picture that knowledge sharing and guidance from experienced project members within e-commerce companies in Dublin, Ireland works well especially taking in count outcomes of projects mentioned by the respondents in question 13 asking about the outcomes of recently

finished projects. It shows that on average 85% of the projects finished successfully, under budget (41%), ahead of schedule (44%) and within the project scope (79%) (Appendix 10.9, Page 88).

#### 4.1.5 Technology and Projects

In question 9 respondents were asked to rate their confidence with tools and software. Looking at table 8 presenting the answers the majority of respondents stated that they are confident using most of the tools listed. Email tool gathered 92% votes being the tool majority of respondents where most comfortable with. The larger part of respondents were stakeholders with more than five years of experience and results have shown that second most important tool used was; personal conversation, meeting and conference call with 77% of responses. According to the survey results only 52% of respondents are very confident with the use of MS Office Pack and 57 respondents stated their confidence with instant messaging and mobile phones is high (70%). Less than 41% of surveyed could boast high confidence with use of both cloud computing and social media. Confidence of use of the Cross collaboration tools received unexpectedly low numbers with only 11% respondents confident in application of this tool. 44% remained undecided (Table9).

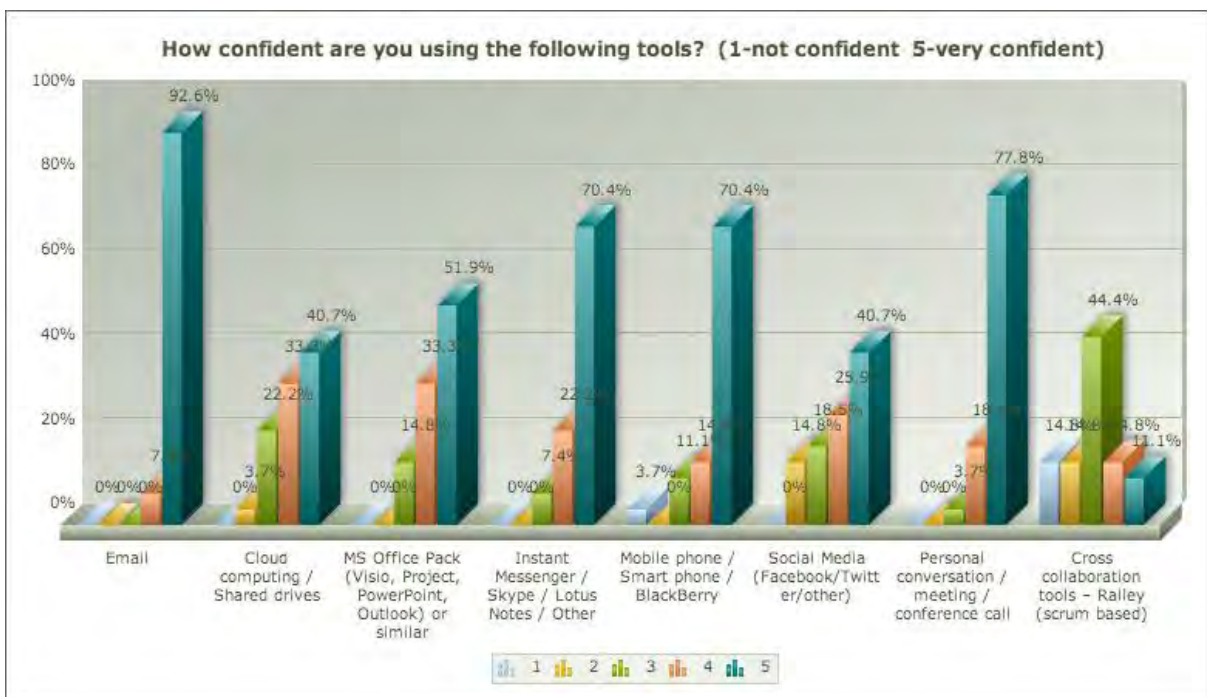


Table 9: Question 9: Confidence with the tools (Source: Author)

Taking into consideration the importance of the tools in the project environment, the researcher looked at the researched tools from the practical use point of view. Analysis of Table 10 revealed that in more than 8 out of 10 cases email would be used very often in process of managing a project. 85% of respondents would also often and very often utilize the personal communication.

According to respondents the MS Office Pack would be implemented in the managing process often and very often in 77% of cases, while instant messenger would be used very often only by 44% of the researched sample. Other listed tools such as cloud computing would be used often and very often in 64% of cases and mobile phone in 52%.

The investigation in the confidence in the use of social media showed that 65% of the researched group was confident and very confident with the tool (Table 9). However 81% of respondents would not use any of the available social media while working with the projects and 55% stated these tools were not useful in the process (Table 11).

In the information overflow era it surprises that email takes such a high note, and it only confirms the fact that it has become our daily communication tool. This shows that email became a reliable and easy accessible tool gaining on meaning in the everyday life and nowadays economy.

Analysing the use of shared drives 74% of respondents valued their confidence with that tool high and very high (Table 11). This shows that higher speed of information exchange and data accessibility is achieved through sharing. Companies are keeping their data in a secure space which in most cases is the intranet and secure servers and the importance of cloud computing is increasing when working with project teams.

The researcher was interested in a correlation between confidence the surveyed sample had with the tools and the usefulness of them. Collating question 9 asking about confidence with question 10 that researched how useful mentioned tools are one can recognize the strong positive correlation between confidence of use of the tools and their usage in the process of managing projects.

66 respondents confident with email (81%) are actively using this tool when working with projects. Similarly 44 respondents (54%) would use personal communication being fully confident with it. Correlation of confidence and application of MS Office Pack and instant messenger made with use of the SPSS Statistics program showed that 27 respondents representing 33% of the population would use these tools in order to manage projects being fully confident with it (Appendix 10.15, Page 97).

One could think that in the modern era of computers, where personal contact is limited to a minimum, the use of personal meeting would lose its value. The results of presented study prove exact the opposite. Another cross tabulation done with SPSS Statistics software confirms that 54 respondents with various experience levels stated that use of personal meeting when working with a project team contributed the most to the success of projects they were involved in. Out of that group 21 respondents were involved in projects for more than 5 years which suggests the importance of application of this tool (Appendix 10.12, Page 91).



Table 10: Question 10: Use of tools in managing a project (Source: Author)

Although the survey confirmed that majority of respondents is very confident with the use of messaging and mobile phones services (Table 9) only 48 respondents who are highly confident with this tool and use it on a daily basis would use messaging while only 24 of respondents confident with the phone would use it when managing a project even though the majority of the projects is time crucial for their companies (see Table 12) and use of these tools allows faster information access.

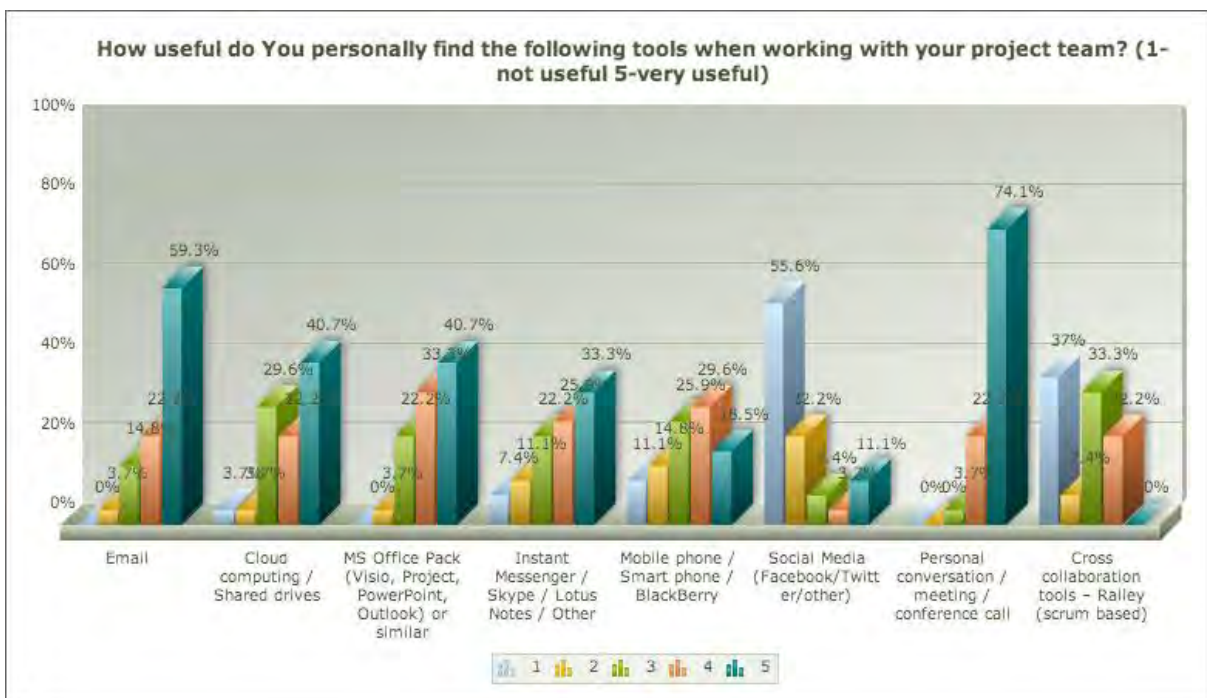


Table 11: Question 11: Usefulness of the tools when working with a project team

In the undertaken research the application of tools has also been researched in regards to experience of respondents in the area of project management. Being interested how experience of surveyed sample impacts application of researched tools a cross correlation of question 3 asking for the respondents experience, with question 10, researching the use of tools while managing a project has been implemented and showed following results:

The experience plays a crucial role in selection of tools needed for a successful project management. Majority of respondents with 5 and more years of experience would use email on a daily basis (33%), personal conversation or meeting (26%) as well as mobile phones (23%). The use of cloud computing and shared drives as well as use of MS Office tools is common amongst 18% of well experienced respondents. These findings prove the importance of experience in the project environment and that it contributes to tools selection for a successful execution and communication as well as for the success of project management team.

Additionally researcher concluded that consistent use of available tools, information accessibility as well as stakeholder's reachability is positively influencing projects outcomes through improving of communication quality, data exchange and accessibility but also planning and control. Results from the cross tabulation using SPSS Statistics software are shown in Appendix 10.11 presented on page 89 of this paper.

#### **4.1.6 Project Success**

Project success is frequently defined in terms of achieving positive results within the constraints of following criteria: cost against budget, time relative to project schedule, and performance against outcome requirements (Schwalbe, 2007).

Taking project success into consideration it is important to analyse factors impacting the outcomes. For this reason the researcher asked in the questionnaire to define the paste of the projects that are undertaken in the researched companies. Projects that carry higher risk of failure through not meeting one of the basic success criteria are usually time critical and according to results of the research are occurring in almost 52 per cent of the cases. 33 respondents representing 41% of the population admitted that projects in their company are fast and competitive and only in 6 cases (7%) that there is no rush in project execution (Table 12). Presented findings indicate that projects conducted in e-commerce sector of Dublin based companies require focus and engagement from every player involved in the assignment and proper application of tools is critical.

**Q8.What is the average project paste in your company?**

	Frequency	Percent	Cumulative Percent
Fast/competitive (time is money)	33	40.7	40.7
Regular (no rush)	6	7.4	48.1
Time critical (completion is crucial)	42	51.9	100.0
Total	81	100.0	

**Table 12: Question 8: Average project paste (Source: Author)**

Effective use of tools combined with effective management can be a source of success for a project. In order to measure the effectiveness of the tools, the researcher asked the surveyed to value three last projects they were recently involved in (Appendix 10.9, Page 88).

Table 13 presented below shows average values calculated from the responses given to the question asking about the effectiveness of tools while working with last completed projects (Question 12). The respondents strongly agreed that email tool (69%) as well as personal communication (60%) are the most useful and efficient tools. 33 surveyed valued MS Office Pack as very useful (41%) whereas the effectiveness of cloud computing divided the respondents showing that shared data access is not always contributing effectively to outcome of a project.

Although confidence with use of cloud computing scored high marks the effectiveness of that data storage system received marks in the middle high area, varying between 10% and 35% which shows the growing trend towards more common use of the tool.

Other tools such as mobile phones as well as instant messaging are tools valued lower by the researched population. In researchers opinion the application of these tools might have only negative impact due to distortions of the message transmitted. Strong majority of respondents stated that use of social media in managing a project is an ineffective tool and does not contribute to success (78%). Please see Table 13.

Surveying outcome of recently finished projects the researcher asked about basic success criteria for the last 3 finished projects in which respondents were involved in. Results show that on average the majority of projects finished successfully (85%), under budget (41%), ahead of planned schedule (44%) and within the project scope (79%) (Appendix 10.9, Page 88). These results are contradictory to the IBM study presented in chapter "Technology in Project Management", where a research on 1500 individuals showed that only 41% of projects met schedule, budget and quality goals, whereas nearly 60% have failed in meeting their objectives. Referring back to the IBM study results 44%

missed at least one success parameter while 15% either missed all goals or were cancelled in the beginning phase (IBM, 2008).

<b>How effective did you found the following tools while working your last 3 completed projects? (1 not useful – 5 very useful) – An Average on last 3 projects.</b>					
<b>Question 12</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Email</b>					
Average	1.97%	0.00%	7.67%	21.63%	68.70%
<b>Cloud computing / Shared drives</b>					
Average	8.33%	23.77%	10.50%	34.00%	23.43%
<b>MS Office Pack (Visio, Project, PowerPoint, Outlook) or similar</b>					
Average	4.53%	3.20%	18.10%	33.03%	41.16%
<b>Instant Messenger / Skype / Lotus Notes / Other</b>					
Average	18.97%	21.60%	15.13%	18.23%	26.03%
<b>Mobile phone / Smart phone / BlackBerry</b>					
Average	33.53%	19.40%	17.37%	14.67%	15.07%
<b>Social Media (Facebook/Twitter/other)</b>					
Average	77.83%	12.27%	1.87%	5.33%	2.77%
<b>Personal conversation / meeting / conference call</b>					
Average	0.00%	0.00%	26.74%	14.00%	59.53%
<b>Cross collaboration tools – Ralley (scrum based)</b>					
Average	45.67%	5.33%	31.07%	4.53%	13.40%

Table 13: Question 12: Average on tools effectiveness

This shows that there is a positive correlation between people and technology in the e-commerce environment in Dublin, Ireland and that successful cooperation between team members depends on proper tools utilisation.

During the literature review the researcher analysed the results of the study by Dvir, Sadeh and Malach-Pines conducted in 2006 analysing the use of tools for all project activities. The Authors concluded that use of same tools for different projects is ineffective and unproductive. Comparing these results with research findings conducted for this paper the researcher discovered that in the e-commerce environment the repeated use of tools for different projects contributes to more effective and efficient use of tools and helps achieving better results through experience. The researcher learned from the results of the survey that different types of projects should be managed in different ways; nonetheless set of tools used may be repeated impacting the success of the undertaking as shown in the Appendix 10.7 on page 86.



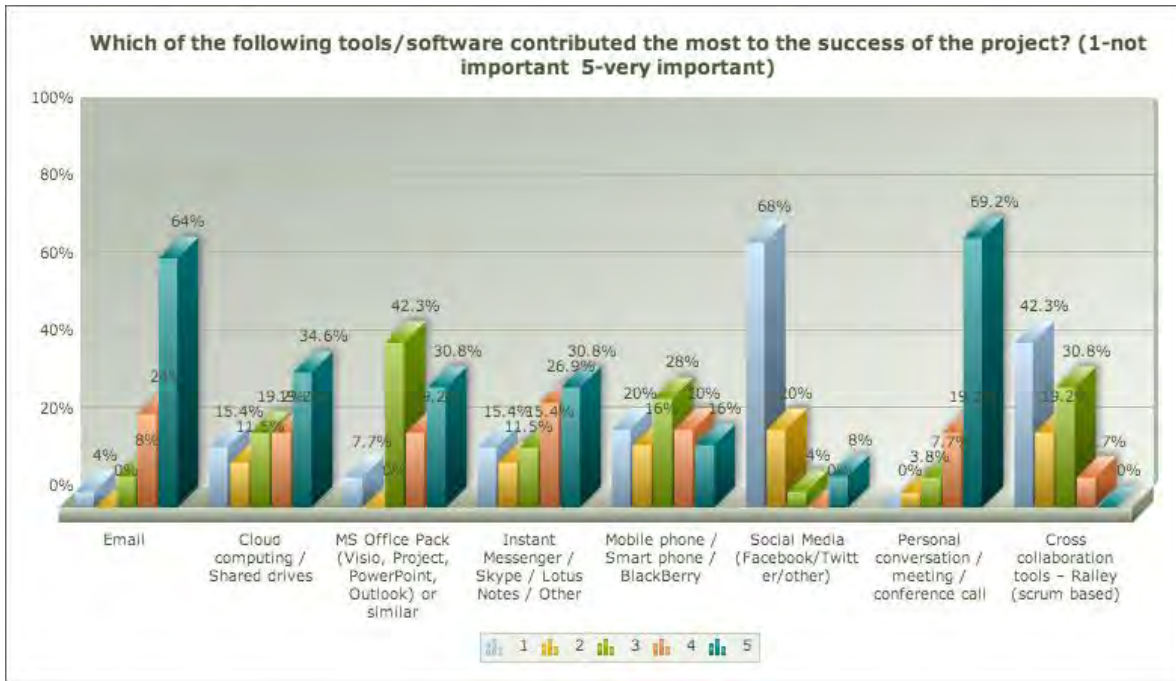


Table 14: Question 14: Contribution of tools to project success (Source: Author)

When asked about the tools that contributed the most to the project success (Question 14) the results showed that strong majority of respondents 70% agreed that personal conversation is contributing the most to the success compared to 30% valuing instant messenger as a useful communication tool. 29 respondents (35%) valued also cloud computing as a large contributor to the outcome of undertaken projects whereas the results for usefulness of MS Office Pack varied between respondents who were undecided 42% and those who valued this tool as very important 30%. The use of social media was valued by majority of respondents as not important receiving 68% compared to barely 8% who would qualify this tool as useful (Table 14). However it is important to remember that some of the mentioned tools complement each other and balanced use of them can contribute to improvement of project outcome.

Appendix 10.12 (page 91) presents the cross tabulation made with the use of SPSS Statistics software looking at project experience and tools that contributed to successful outcome of the project. Willing to investigate how these two factors correlate with each other the researcher came to following:

Most favourable tool amongst respondents with middle to high project experience was personal conversation with 41 votes for high contribution of this method (50%) to success and 36 respondents selected use of email as contributing communication method (44%). It is worth mentioning that use of cross collaboration tools in process of managing a project was not valued high through the respondents of the survey and received rather negative results with majority of respondents stating that its effectiveness was insignificant. This is impacted by low confidence with use of this tool

presented in table 9. 62% of all respondents found also use of social media ineffective and not contributing to successful outcome of a project (Appendix 10.12, Page 91).

## 4.2 Findings

This section presents findings from the data analysis. In chapter 3 the researcher proposed three hypotheses in order to interpret the problem and to guide him through the research. The data for this study was collected and processed in response to research objective presented in chapter 3.

### 4.2.1 Research Question 1

“What is the impact of software application on the outcome of the project and is it dependent on company size?”

The majority of responses came from the stakeholders active in companies hiring more than 600 employees (70% of responses). The research did not find any variance between use of researched tools and company size. The researcher is convinced that all e-commerce companies have access to same software and tools, and only the usage and application differences are visible especially between groups of stakeholders with various experiences.

The results of the survey showed that 85% of the projects finished successfully with 80% reaching the planned scope (Appendix 10.9, Page 88). 90% of respondents valued email as useful or very useful in the process. The majority of respondents stated also that personal conversation has huge importance when managing a project team with exception of 21 stakeholders (26%) who remained undecided (Appendix 10.7, Page 86). This means that majority of projects rely on communication and value email for its functionality and reliability mostly thank to wide acceptance of this tool. However the results show also that in the advanced technology era the personal contact is indispensable. Personal conversation, use of conference calls and meetings give team members possibility to communicate more effectively through faster information exchange allowing better team understanding and immediate response and reaction from the management.

The use of MS Office products as well as cloud computing has according to majority of respondents contributed to the successful outcome. Project success depends on planning and work distribution. Keeping the progress on track and adapt the available resources according to the current project needs is important. On average 44% of respondents found MS Office and similar tools useful and 33% very useful when planning and controlling. The implementation of these tools remains in hands of project managers and middle and upper management. These tools in connection with data sharing systems allow quick and reliable information access. Results of the survey are showing a trend tending towards the effectiveness of shared storage methods with 57% of respondents valuing it

high (Appendix 10.7, Page 86). Nowadays companies rely on information and through use of integrated systems gain competitive advantage.

These results show that information accessibility and fast information exchange have large impact on the outcome of projects and shows that in the fast changing environment where all players have similar access to the tools, the size of the company does not play a major role in achieving the goal and the outcome of an undertaking is depending on effective application and use of the tools available. Skills and knowledge of team members as well as team size and project complexity help defining the tools to be used in the process of planning and executing. These results confirm also the research done by Quade in 2012 mentioned in chapter Technology and project success who stated that quality of communication and collaboration is the critical factor for the success of the project (Quade et al, 2012). Therefore reaching agreement on technologies used in managing a project is a must as it contributes to the outcome.

#### **4.2.2 Research Question 2**

“How does the experience of a project stakeholder influence the outcome of the undertaken project?”

The researched sample surveyed employees representing different company hierarchy levels varying from contractors and front line staff members representing 11% through professional staff with 25% of respondents through middle management 29% up to representatives from the upper management sector constituting 11% of the sample (Appendix 10.6, Page 86). These results allowed framing an overview of the researched problem helping the researcher to deepen it and present the findings from the average representative of the group relevant for this research.

Results on the educational background showed that the majority of surveyed stakeholders are not certified or awarded with a higher education in the area of project management. Having a closer look at the researched sample from the experience point of view the respondents are divided in two groups. Those with none to three years of experience are represented by 44% whereas respondents with three to five years constitute 51% of the sample (Appendix 10.3, Page 84). The presented result show that not necessary the education but the experience gathered over the years contributes the most to the final outcome of the projects. For this purpose the researcher collated questions asking for experience (Question 3) and number of people involved in teams (Questions 7). From this cross tabulation the research read that experienced respondents work preferably with smaller teams as these facilitate easier communication, faster data exchange, shorten decision change chains and collaborate better.

The findings from the conducted research show that there is impact of stakeholders experience on project success and multiple factors influence the outcome of the projects. Keeping in mind that majority of the projects undertaken in the e-commerce industry is fast, competitive and time critical. The confidence in use of the available tools and practical experience gathered over years contributes to accurate selection of tools used in process of planning and executing of project whose outcomes define the future of the companies.

#### 4.2.3 Research Question 3

“How does the experience of a project stakeholder impact the use of the available tools in project work?”

The ability to choose and apply proper tools to achieve a desired goal is a skill set that a project manager gathers with time. As already mentioned there is a positive impact of experience of a project stakeholder on the outcome of the undertaken project. The author of this paper agrees with Bridges (2013) who states that in the nowadays business a project manager plays the governance role. He creates the plan, is responsible for efficient resource usage tracks the progress and adds value when the goal is achieved. In order to utilise these tasks a careful selection of tools and techniques is needed.

An optimal experience and skill mix can be only achieved through long time training, knowledge sharing and constant performance improvement process. It depends on personal abilities of the stakeholder and also on time spent working in projects environment. The researcher set together replies on issues related to project experience of the surveyed sample (Question 3) with results from question 10 asking about the use of tools in process of managing a project. The results show that more experienced respondents value more email and personal communication, whereas less experienced prefer quick information exchanged often achieved through instant messenger and phone as communication medium.

Experience gathered helps to understand that tools possess key properties that support particular functions in a project and through their design contribute to performance improvement. Experience plays a unique role in the process of managing project teams and the results of conducted research have shown that confidence with tools finds reflection in application of these.

## 5 Conclusions

The overall purpose of this chapter is to sum up the theoretical findings gathered in literature review chapter and combine them with quantitative research findings presented in chapter 4 in relation to the primary research question:

“How does appropriate use of communications technology influences project success”.

The main objective of this study was to obtain information on how use of commonly available communication, data storage and planning tools can impact the success of projects undertaken in the modern, e-commerce companies located in Dublin, Ireland.

Three research questions have been asked in order to help the researcher find the solution to the problem of this study. By reviewing available literature sources and analysing findings from the conducted questionnaire the researcher tested the research questions.

The following three major research hypotheses have been proposed and tested:

- H1 - Use of the available software will be positively related to project success
- H2 - The project success will be related to experience of a project manager and his education level
- H3 - Level of project managers experience has a positive relationship with application of technology and its use in projects

### 5. 1 Conclusion to First Hypothesis

**H1** – Use of the available software will be positively related to project success

Review of the literature on topic of technology in project management and taking into consideration the primary research findings it is evident that in the e-commerce companies across Dublin, Ireland the use of technology plays a major role contributing to success of projects undertaken by project management teams.

The literature review showed that a Research done by Gartner Research estimates that 75% of large IT projects managed with the support of a project management information system will succeed, while 75% of projects without such support will fail (Light, et al 2005). Interactive planning, collaboration and engagement of all team members in processes improves the quality of work and contributes to the outcome of the projects. The results of presented study confirm that the use of

communication tools such as email and personal meetings in conjunction with shared data access resulted in successful completion of 85% of projects.

## 5.2 Conclusion to Second Hypothesis

**H2** – The project success will be related to experience of a project manager and his education level

The reviewed literature implicates that project success is possible only through connection of various factors including time, scope and budget and cannot be achieved if these criteria are not met. However the results presented in Appendix 10.9 (Page 88) presenting outcomes of recently completed projects show that even if one criteria of success is not met the whole project is still valued as successful. Satisfying the requirements of budget and schedule is in the fast changing environment no longer the basic criteria of success. Meeting the projects objectives becomes priority for nowadays project teams as new, innovative products help gaining advantage over competitors.

The researcher believes that the experience and education level of the project stakeholders and focus on the deliverable count the most in nowadays economy. The presented study proved that experience influences the outcome through practical use of available tools. Through use of cross correlation of results from question asking about experience (Question 3) and question researching the tools used when working with projects (Question 10) the researcher showed that respondents experienced in project environment tend to use communication tools such as email and personal meeting, data sharing and planning and control tools contained in MS Office Pack (Appendix 10.11, Page 89). However the results measuring the education in the area of project management (Question 5) show that minority of respondents representing 27% of the sample admitted to having a certification. Taking this into consideration the researcher concluded that knowledge sharing and guidance from practicing stakeholders adds value to the process and contributes to the success.

Project success does not depend on separate factors and is not occurring in isolation. The conducted study showed that there is an immense influence of human factor on the outcome. The author agrees with Shenhar (2005) who stated that it is up to manager's unique skills that a project achieves a success or becomes a failure as they are leaders who can effectively function strategically, operationally and humanly adapting the tools to the current needs.

Though proper application and utilisation of available tools focus on final outcomes and work with small project groups enhance the successful outcome of projects.

### 5.3 Conclusion to Third Hypothesis

**H3** - Level of project manager's experience has a positive relationship with application of technology and its use in projects

The majority of respondents found personal conversation and email as tools that contributed the most to the project success. What surprises the researcher is that pointed tools are in use for longer time already and although newer and more reliable technologies are available, these tools still are valued and used frequently. The researcher is convinced that this happens due to experience and confidence level of managers, who are used to the tools but also due to common availability of the used tools as the effectiveness of their usage is only possible when all stakeholders have access to them.

The researcher concluded that in the e-commerce sector achieving the goal when working on a project remains the main focus while delays as well as costs are often neglected and not important in the process. This derived from analysis of question asking about outcome of the last completed projects (Question 13). Results show that even being over budget or behind the schedule majority of projects met the planned objectives and contributed to success of the project team (Appendix 10.9, Page 88).

The majority of researched projects in e-commerce sector in Dublin, Ireland were time critical and competitive what in researchers opinion qualify them into the higher risk group. Nonetheless 85% reached their target and completed successfully. From the number of high experience respondents and the success rate of surveyed projects the researcher concludes that previous experiences made in the area of project management contributed to current outcomes. The improvement in use of tools comes in pair with the confidence of using them and repeated application of tools and conclusions made on mistakes made improve the outcome of future undertakings.

In the information technology era where time is money and introduction of new products to the market is crucial for the companies market position and very often their existence the use of available resources must be managed. From the conducted research the researcher agrees the impact of used tools plays important role to the outcome of planned undertakings however it is up to skills and experience of project staff to organise the project team, allocate available resources and stream the workflow towards the goal.

#### 5.4 Summary

IBM study conducted in 2008 proved that most of the projects fail and it is up to human factor to lead the project to success. Presented study showed that majority of projects conducted in the Irish e-commerce environment are successful, on budget and on time, however the researcher agrees that leadership played a major role in the process.

The presented paper confirms statement made by Moncrief (1999) that the infusion of technology has led to considerable changes in business practices, particularly those that relate to communication and workload distribution and even though the use of technology plays a major role in supporting project managers in managing projects, it is up to personal skills and qualifications to choose the proper tools.

To answer the primary research question one must look at all the factors influencing the projects outcome. The researcher confirms with this thesis that there is an impact of available tools on the outcome of the project, however not the application of tools alone contribute to the final outcome. It is up to managers and their skills and experience to utilize and implement proper tools in the right situation and it is up to entire project team to focus on achieving the goal and lead the project toward success.

The review shows that experience of stakeholder allows also planning and predicting of factors that might bring the project of the track and the use of technology only supports and controls them. This confirms Atkinson's (1999) findings that time, cost and quality factors only accompanied by information technology are crucial for companies' success in nowadays fast changing economy especially due to their functionality.

However most of the surveyed companies are multinational and are active on the global market, their projects are introduced and managed from headquarters located in Dublin, Ireland showing that management methods become more and more unified and international and practices from other parts of the globe can be successfully implemented in any region of the world.

Surveyed stakeholders belong to a group of international specialist working with multinational teams whose projects are often dispersed through the world. Their work relies on use of communication tools as well as shared drives used for fast and secure data exchange. It shows how important these tools are in nowadays management and the frequency of application of these tools presented with this research confirms that in fast changing economy speed is critical for the success. This can be only achieved by implementation of technology.



## 6 Recommendations

The purpose of this study was to determine the relationship that exists between wide understood technology and its impact on the success. Following the presented analysis the researcher suggests that the following recommendations be considered:

In order to reach higher grade of success in conducting the projects the author suggests wider application of planning and controlling tools available with MS Office Pack. Through utilisation of this tool profits the whole project team and in connection with cloud computing all project stakeholders remain informed about the current situation of the projects, what shortens the reaction time in case of difficulties.

Another recommendation is the increase in general application of collaboration tools. The application of this tool involves all project team members in the project work, encouraging team efforts in achieving the goal.

The study of e-commerce companies located in Dublin, Ireland shows that in order to remain competitive each company is dependent on project management and the results achieved in project success rate are worth implementing in other areas of business.

As this study was conducted only on a small sample of population represented by stakeholders active in the project environment in e-commerce companies active in Dublin, Ireland the researcher recommends utilization of a larger scale study from wider range of e-commerce companies involved. This would allow gaining wider picture on the problem, guaranteeing greater reliability of collected data and would allow greater generalizations that could be made based on such findings. An interesting approach would be to conduct a similar research in two or three different regions and compare and analyse gathered data allowing the deeper investigation on a larger group of respondents.

## 7 Self-Reflection on own Learning and Performance

The researcher moved to Dublin in 2008 in search for new work and life opportunities after finishing Masters Studies in Economics in Berlin, Germany. Working in one of the e-commerce companies in Dublin, Ireland his will to expand the knowledge and extend his area of expertise came after three years of active work on campaigns and projects.

Prior to moving to Dublin, researcher worked in project environment as event and project manager for an advertisement agency where he started collecting knowledge and experience being guided by professionals. Work atmosphere and exposure helped to reveal leadership qualities as well as management and organizational qualities that are used by researcher until now.

Willing to expand his knowledge, looking for new challenges the researcher relocated to Ireland, where he started working in international corporations learning the new environment observing and absorbing new management styles.

Combining his career goals with already possessed skills the researcher started getting an outlook on his possible career shift in the future and becoming a project manager.

The researcher decided to continue education pursuing the International MBA program from the Dublin Business School in order to gain new and improve existing skills that would help to attain his goal. The Course covered interesting subjects such as “Strategic Management”, “Project management tools and techniques” as well as “Planning and Control” which helped gaining new knowledge on the subject and through its implementation observing the theory in practice.

Over the course of the study the researcher completed various test, individual and group assignments, group reports and presentations as well as written and oral exams. The Program offered the researcher an opportunity to interact with international intellectuals during lectures, group projects and assignments. This experience ensured that the researcher acquired practical skill sets by learning from others through written and oral communication, exchanging learning methods and styles.

Thank to feedback sessions and friendly support of classmates the researcher was able to realise and reduce mistakes made in his daily tasks and assignments and felt confident when approaching the dissertation stage.

## 7.1 Skills Development

Through participation in the MBA program the researcher gained theoretical knowledge that is crucial in a real work environment and that contributed to adding value of current knowledge base through practical application of learned methods and techniques.

Kolb defines learning as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience"(Kolb 1984).

Basing on his work, four learning styles could be identified:

1. Diverging - People with this learning style are best at viewing concrete situations from many different points of view.
2. Assimilating - People with this learning style are best at understanding a wide range of information and putting it into concise, logical form.
3. Converging - People with this learning style are best at finding practical uses for ideas and theories.
4. Accommodating - People with this learning style have the ability to learn from primarily "hands-on" experience.

Looking back at the time when the researcher signed up for the MBA program he would qualify himself into the group with diverging and accommodating learning style. Through the course of the MBA program the researchers learning style evaluated, and through practical assignments and tasks given in different modules over the course of time the researcher evolved and would qualify himself into assimilating and converging group at present.

The program has strongly contributed to development of researcher's decision-making skills. Through wide analysis of case studies, practical examples, presentations and "in class" discussions the researcher learned how to make timely and well considered decisions based on limited sets of available information.

Another important skills gained through the participation in the course gained during assignments was group presentations and public speaking. Working with a group of same-minded individuals the researcher developed team-working skills, gained confidence in public speaking and through feedback sessions expanded overall performance abilities. The researcher is convinced that this experience helped him expanding business language and business knowledge that he was lacking.

The MBA program provided many opportunities to develop project management skills. Before enrolling into the course the researcher perceived this skill as a weakness. The opportunity to work in groups developed strategic planning and encouraged implementing time and resource management skills allowing to develop work patterns and improving general management techniques. These skills contributed mostly to on time completion of the presented dissertation.

The dissertation stage also added value to researchers learning. Improvements in personal time management and professional way of overcoming objections are noticeable in researcher's behaviour. Personal discipline and logical approach to projects together with research skills and work evaluation became useful points for the current and future career.

### **7.2.1 Cognitive Skills**

Cognitive skills refer to the abilities to gain meaning and knowledge from experience and information. It is a process of obtaining knowledge through experience and senses (Oxfordlearning, 2013). The researcher has prior academic experience and background thanks to previous studies undertaken in Berlin, Germany in area of economics and management.

Prior to beginning of the MBA program the researcher rarely got difficulties in applying theory in practice nonetheless the course provided by Dublin Business School has thought him new management theories and introduced him to the ways of their application in the present business environment.

Through preparation of the presented paper the researcher gathered experience in data collection. Prior to execution of the survey the researcher has tested various data collection packages and experimented with the pilot questionnaires in order to gain accuracy and experience with software. This contributed to improvement of analysing skills as the researcher had to choose the software that would be most appropriate for conducting his work.

While preparing and formulating the research questions and hypothesis researcher was equipped with knowledge gained during the "Research skills and analysis" classes. These valuable lectures helped to organise and structure the research on the surveyed topic and gave general directions on how to approach the dissertation thesis.

Through the preparation and execution of this dissertation paper, the researcher developed his cognitive skills.

### **7.2.2 Research Skills**

The research approach, strategy and philosophy learned in the MBA program allowed the researcher to enter the dissertation stage with confidence.

The work on the dissertation and thesis helped the researcher to understand and identify own thought processes and expand the general way of viewing the surrounding environment. Through introduction of new analysis methods the researcher expand his analysis in that field by learning new and extending the knowledge of existing software i.e. SPSS Statistics, Microsoft Excel.

### **7.2.3 Critical Analysis Skills**

Work on case studies and other assignments during the MBA program increased the analysing skills. This helped to contrast the work experience brought from Poland with experience collected while working in Germany and Ireland. Case studies contributed to wider understanding of project environment and real life problems through analysis and conclusions and discussions that were part of lectures during the studying time. Through preparation for this paper the researcher reviewed books, journal articles and other resources available online and in libraries, critically analysed them and came to conclusions important for the research.

### **7.2.4 Interpersonal Skills**

Prior to the MBA researcher was involved already in multinational groups, working with different cultures, nonetheless taking part in various group assignments helped to develop further communication skills. The MBA program had given many opportunities to interact and communicate with same-minded community of people focused on same goal with different national backgrounds.

During four semesters, working with groups of 4-5 individuals, the researcher learned how different work approach might be amongst different cultures, how to overcome objectives of single team members and how to express himself more effectively.

Speaking in public, preparation and presentation of multimedia presentations together with discussions about the assigned tasks contributed widely to researchers experience.

During the dissertation stage the researcher remained in constant contact with the dissertation supervisor exercising good written and oral communication. This helped to increase reporting skills, work distribution skills and effectively manage the time.

### **7.2.5 Personal Management Skills**

Prior to begin of the MBA program the researcher approach to planning and organizing his work was much different from that at the end of the dissertation stage. The researcher was not proficient in

organizing his work, what often resulted in completion of the assignments shortly before the submission date. Through the qualification to the MBA program the researcher improved his time management skills and worked on his self-motivation, having in mind past assignments. Thanks to instructions and advice received from the dissertation supervisor, the researcher became more efficient and effective.

The four semesters MBA program allowed practicing new workload distribution techniques, both in business as well as in study time what has yielded good results and now he is able to finish undertaken tasks on time and within scope. Techniques inquired in the “Planning and control” lectures helped understand and implement topics covered.

#### **7.2.6 Management Skills**

The researcher is convinced that strong multinational and multicultural variation of students in the MBA program created great opportunity to gather new experiences.

In the course of the program the researcher learned how to approach and manage projects, introducing fresh skills into the professional life, taking ownership of assignments at work through practical implementation of theories learned in college.

In his current role the researcher implemented gained skills and knowledge and leads small project on behalf of his department.

Working full time the researcher had to be disciplined and focused in order to attend lectures and complete all thought modules with positive results. During the course of the MBA program the researcher learned how to balance work and private life, focusing on both without neglecting quality of any.

#### **7.3 Challenges and Problems Encountered**

During the MBA program and in the dissertation stage the researcher had to face a number of difficulties. The first challenge was with the proper work, study life balance. Researcher is a full time employee, working as a campaign specialist in an e-commerce company located in north Dublin. The researcher introduced weekly planning in order to comply with college and work without harm to personal life. This exercise improved time management skills.

Teamwork is an inseparable element of an MBA program. While working on team assignments the researcher realized the difficulties in coordinating times and locations of meetings suitable for all team members. Experience in multinational teams helped the researcher to manage that challenge and contributed to personal development of people management skills.

The third challenge appeared prior to dissertation stage and was combined with the selection of a suitable topic. This involved wide research and literature analysis proving that selection of a good topic is not an easy task. Cognitive skills developed in during the 4-semester MBA program helped the researcher to overcome this objective.

While working on the dissertation the researcher used various tools and computers. In order to keep all files up to date, a cloud storage space has been arranged and a reliable back up system introduced. This way the researcher avoided data losses experienced in the past.

#### **7.4 Future Applications of Gained Knowledge**

The researcher chose the dissertation subject in order to combine requirements of the MBA in Project Management with his own work. Having done so, the researcher feels more confident in the project environment and is ready to apply gathered skills in the real world.

The MBA program and the dissertation have built a solid foundation on which to build new career goals. The researcher can actively look for new opportunities and feels confident when working with complex tasks, knows how to manage work effectively and distribute it in time in order to complete assigned tasks. The researcher is convinced that these skills will help in following the dream of becoming an efficient project manager.

#### **7.5 Conclusion**

After completion of the MBA program the researcher will become a valuable member of project teams equipped with knowledge and new experiences. Improved problem solving skills, management skills and personal management skills will bring definite change into researchers work and personal life.





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## 10 List of Appendices

### 10.1 The Survey Questionnaire

#### Technology and its influence on Project Success

1. Which category describes your industry
  - Social media
  - Banking
  - IT/communications/ high tech
  - Government
  - Engineering / software development
  - Other
2. What is the number of employees in your organization
  - Less than 100
  - 100 – 300
  - 300 – 600
  - 600 and more
3. How long is your project experience
  - Under 1 year
  - 1-3 years
  - 3-5 years
  - 5 years and more
4. What is your role in Projects
  - Project Sponsor
  - Project manager
  - Project customer
  - Project team member
  - Department manager
  - Contributor
  - Consultant
  - Other project staff
5. Are you certified in Project Management (PMP/CAPM/Education/Other)
  - Yes
  - No
6. What is your current position in the organization
  - Lower management
  - Middle management
  - Upper management
  - Professional staff
  - Employee / contractor
  - Other
  -



7. What is the number of people involved in a project team
  - Less than 10
  - 10-20
  - 20-50
  - 50 and more
8. What is the average project pace in your company
  - Regular (no rush)
  - Fast/competitive (time is money)
  - Time critical (completion is crucial to succeed)
  - Blitz (crisis project)
9. How confident are you using the following tools (1 not confident 5-very confident)
  - Email
  - Cloud computing / Shared drives
  - MS Office Pack (Visio, Project, PowerPoint, Outlook) or similar
  - Instant Messenger / Skype / Lotus Notes / Other
  - Mobile phone / Smart phone / BlackBerry
  - Social Media (Facebook/Twitter/other)
  - Personal conversation / meeting / conference call
  - Cross collaboration tools – Ralley (scrum based)
10. What tools/software do you use in order to manage projects you are involved in (1 – not often – 5 very often)
  1. Email
  2. Cloud computing / Shared drives
  3. MS Office Pack (Visio, Project, PowerPoint, Outlook) or similar
  4. Instant Messenger / Skype / Lotus Notes / Other
  5. Mobile phone / Smart phone / BlackBerry
  6. Social Media (Facebook/Twitter/other)
  7. Personal conversation / meeting / conference call
  8. Cross collaboration tools – Ralley (scrum based)
11. How useful do you personally find the following tools when working with your project team (1-not useful – 5 – very useful)
  - Email
  - Cloud computing / Shared drives
  - MS Office Pack (Visio, Project, PowerPoint, Outlook) or similar
  - Instant Messenger / Skype / Lotus Notes / Other
  - Mobile phone / Smart phone / BlackBerry
  - Social Media (Facebook/Twitter/other)
  - Personal conversation / meeting / conference call
  - Cross collaboration tools – Ralley (scrum based)
12. How effective did you find the following tools used in your last projects, please rate (1 not useful – 5 very useful):

	Project A	Project B	Project C
Email			
Cloud computing			
MS Office Pack or similar			
Instant Messenger / Skype / other			
Mobile Phone / Black Berry			
Social Media (Facebook/Twitter)			
Personal conversation / meeting / conference call			
Cross collaboration tools – Ralley (scrum based)			

13. What was the outcome of the projects mentioned in Q12:

	Project A	Project B	Project C
Successful	Yes / No /	Yes / No /	Yes / No /
Not Successful	Yes / No /	Yes / No /	Yes / No /
Under Budget	Yes / No /	Yes / No /	Yes / No /
Over Budget	Yes / No /	Yes / No /	Yes / No /
Ahead of schedule	Yes / No /	Yes / No /	Yes / No /
Behind the schedule	Yes / No /	Yes / No /	Yes / No /
Met the Project Scope	Yes / No /	Yes / No /	Yes / No /
Didn't meet the Project scope	Yes / No /	Yes / No /	Yes / No /

14. Which of the following tools/software contributed the most to the success of the project (1 not important – 5 very important)

- Email
- Cloud computing / Shared drives
- MS Office Pack (Visio, Project, PowerPoint, Outlook) or similar
- Instant Messenger / Skype / Lotus Notes / Other
- Mobile phone / Smart phone / BlackBerry
- Social Media (Facebook/Twitter/other)
- Personal conversation / meeting / conference call
- Cross collaboration tools – Ralley (scrum based)

If you would like to be updated on the results, please enter your email address below:

□

I would appreciate if you could forward this survey to a member of your company that in your opinion could contribute to my research. Thank you in advance.

## 10.2 The Survey Consent Form

Hi,

My name is Igor Meller and I am a MBA student in Project Management Program at the Dublin Business School.

I am conducting a survey as part of my dissertation.

The survey involves answering general demographics questions and questions about your experience and knowledge of project management related issues.

The survey takes about 10 minutes to complete.

The purpose of the survey is to measure the impact of available technology on project success rate. Your participation is voluntary, and your responses will be completely anonymous. The data I collect will be analyzed only by me. You do not have to answer any question you would rather not answer.

By filling out the survey you are consenting to participate.

To Begin follow: **Survey Igor Meller**

or copy this link into your browser:

<http://www.smart-survey.co.uk/s/83511KHGZC>

Please reply to the survey until Friday 28th June 2013. Thank you.

This project is supervised by John Lamont from the Dublin Business School.

If you have any questions about the assignment, you can contact DBS under +353 (0) 1 4177500

The results of my project will be available after 15th August 2013. If you would like a copy of the results of my project or have any questions, please provide me with your email address in the proper survey section.

Please keep this letter for your records. Thank you for your participation.

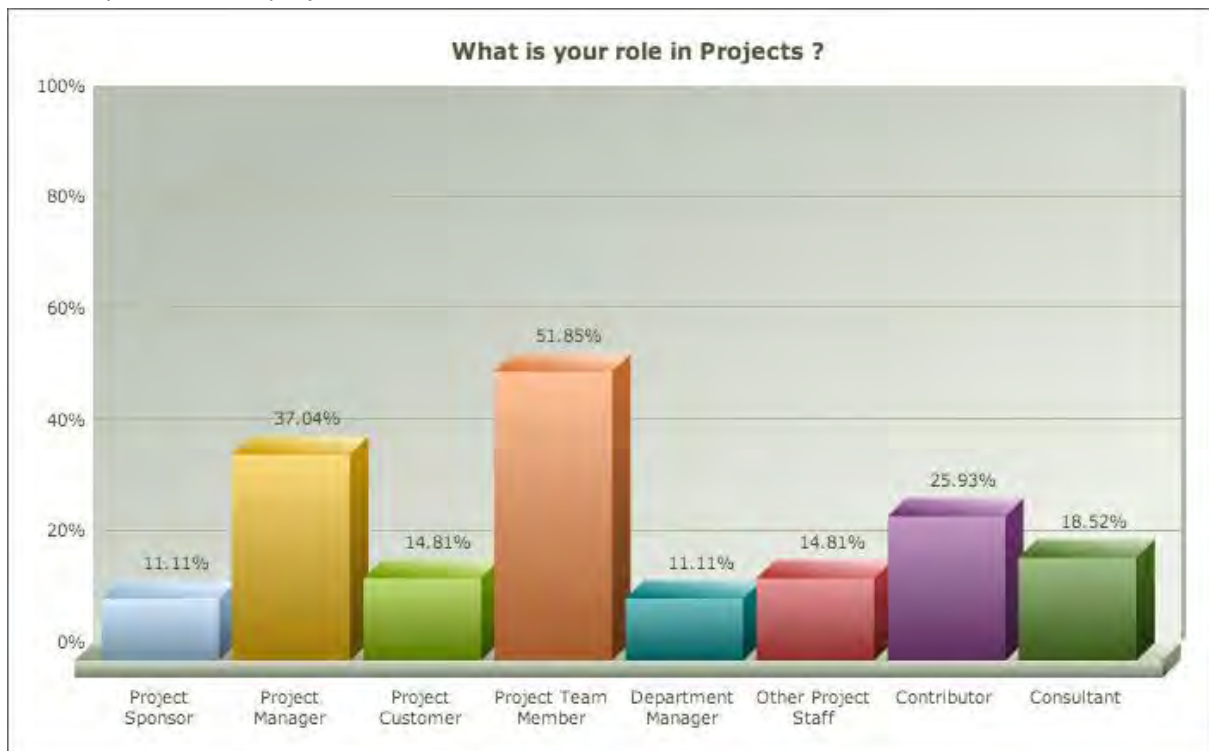
### 10.3 Results Question 3

How long is your project experience?



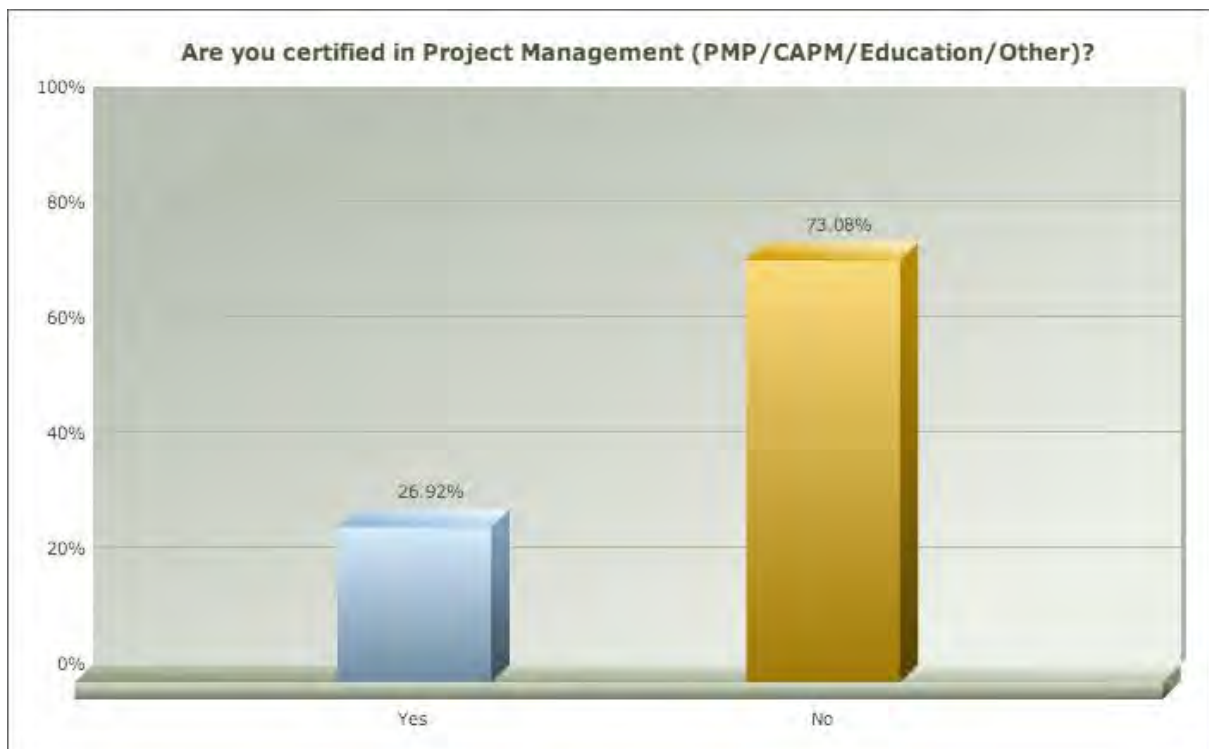
#### 10.4 Results Question 4

What is your role in a project?



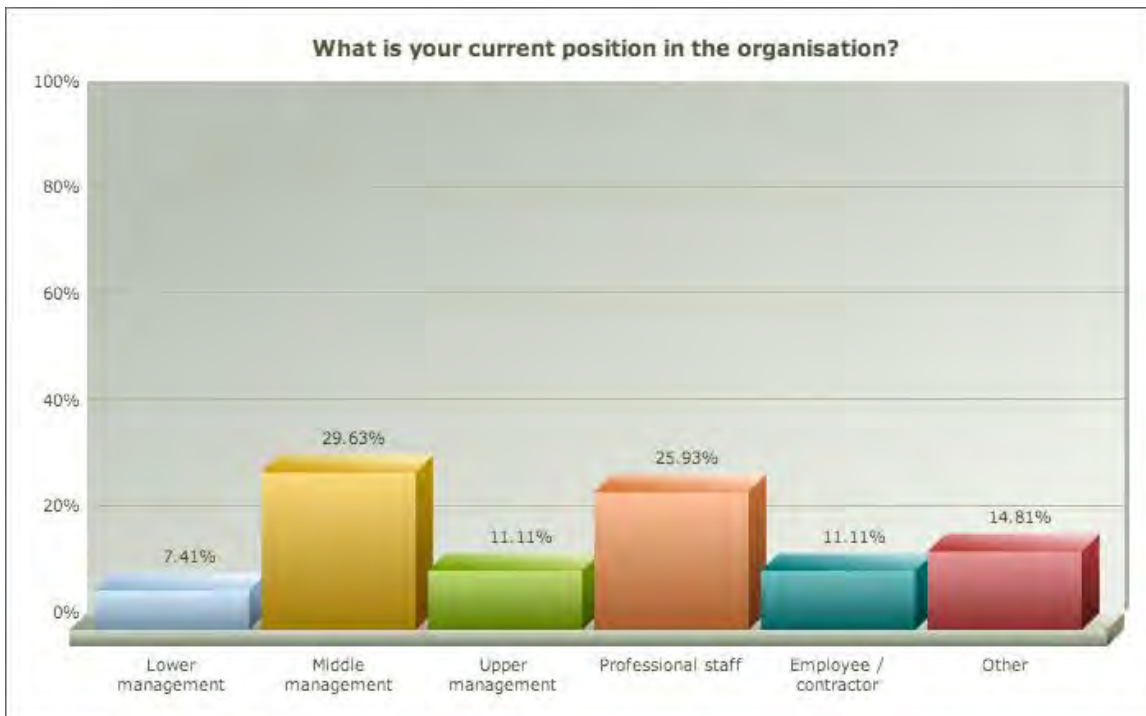
#### 10.5 Results Question 5

Are you certified in Project management?



### 10.6 Results Question 6

What is your current position in the organization?



### 10.7 Results Question 11

How useful do you personally find the following tools when working with project team?

How useful do You personally find the following tools when working with your project team? (1- not useful 5-very useful)					
Question 11:	1	2	3	4	5
Email	0.0%	3.7%	14.8%	22.2%	59.3%
Cloud computing / Shared drives	3.7%	3.7%	29.6%	22.2%	40.7%
MS Office Pack (Visio, Project, PowerPoint, Outlook) or similar	0.0%	3.7%	22.2%	33.3%	40.7%
Instant Messenger / Skype / Lotus Notes / Other	7.4%	11.1%	22.2%	25.9%	33.3%
Mobile phone / Smart phone / BlackBerry	11.1%	14.8%	25.9%	29.6%	18.5%
Social Media (Facebook/Twitter/other)	55.6%	22.2%	7.4%	3.7%	11.1%
Personal conversation / meeting / conference call	0.0%	0.0%	3.7%	22.2%	74.1%
Cross collaboration tools – Ralley (scrum based)	37.0%	7.4%	33.3%	22.2%	0.0%

### 10.8 Results Question 12

How effective did you find the following tools while working your last 3 completed projects?

<b>How effective did you find the following tools while working your last 3 completed projects? (1 not useful – 5 very useful)</b>					
<b>Question 12</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Email</b>					
Project A (recently completed)	0.0%	0.0%	11.5%	19.2%	69.2%
Project B	0.0%	0.0%	5.6%	22.2%	72.2%
Project C	5.9%	0.0%	5.9%	23.5%	64.7%
<b>Cloud computing / Shared drives</b>					
Project A (recently completed)	8.0%	20.0%	20.0%	16.0%	36.0%
Project B	11.1%	27.8%	5.6%	38.9%	16.7%
Project C	5.9%	23.5%	5.9%	47.1%	17.6%
<b>MS Office Pack (Visio, Project, PowerPoint, Outlook) or similar</b>					
Project A (recently completed)	8.0%	4.0%	20.0%	36.0%	32.0%
Project B	5.6%	5.6%	16.7%	27.8%	44.4%
Project C	0.0%	0.0%	17.6%	35.3%	47.1%
<b>Instant Messenger / Skype / Lotus Notes / Other</b>					
Project A (recently completed)	16.7%	25.0%	16.7%	8.3%	33.3%
Project B	16.7%	22.2%	11.1%	11.1%	38.9%
Project C	23.5%	17.6%	17.6%	35.3%	5.9%
<b>Mobile phone / Smart phone / BlackBerry</b>					
Project A (recently completed)	37.5%	12.5%	29.2%	4.2%	16.7%
Project B	27.8%	22.2%	11.1%	22.2%	16.7%
Project C	35.3%	23.5%	11.8%	17.6%	11.8%
<b>Social Media (Facebook/Twitter/other)</b>					
Project A (recently completed)	79.2%	8.3%	0.0%	4.2%	8.3%
Project B	77.8%	16.7%	5.6%	0.0%	0.0%
Project C	76.5%	11.8%	0.0%	11.8%	0.0%
<b>Personal conversation / meeting / conference call</b>					
Project A (recently completed)	0.0%	0.0%	16.7%	25.0%	58.3%
Project B	0.0%	0.0%	33.3%	11.1%	55.6%
Project C	0.0%	0.0%	29.4%	5.9%	64.7%
<b>Cross collaboration tools – Ralley (scrum based)</b>					
Project A (recently completed)	45.5%	4.5%	36.4%	13.6%	0.0%
Project B	44.4%	5.6%	33.3%	0.0%	16.7%
Project C	47.1%	5.9%	23.5%	0.0%	23.5%

### 10.9 Results Question 13

What was the outcome of the three recent projects?

What was the outcome of the projects mentioned in Q12		
Question 13	Yes	No
<b>Project A</b>		
Successful	88.5%	11.5%
Under Budget	52.4%	47.6%
Ahead of schedule	54.5%	45.5%
Met the Project Scope	76.2%	23.8%
<b>Project B</b>		
Successful	78.9%	21.1%
Under Budget	37.5%	62.5%
Ahead of schedule	41.2%	58.8%
Met the Project Scope	81.3%	18.8%
<b>Project C</b>		
Successful	88.9%	11.1%
Under Budget	33.3%	66.7%
Ahead of schedule	37.5%	62.5%
Met the Project Scope	80.0%	20.0%

### 10.10 Cross Tabulation: Question 3 – Question 7

**Q3.How long is your project experience?**

**Q7.What is the number of people involved in a project team**

**Cross tabulation**

	Q7.What is the number of people involved in a project team?				Total
	< 10	10 - 20	20 - 50	50 >	
Q3. Under 1 year	12	0	0	0	12
1-3 years	9	15	0	0	24
3-5 years	3	6	3	0	12
5 years +	15	6	6	3	30
-	3	0	0	0	3
Total	42	27	9	3	81



### 10.11 Cross Tabulation: Question 3 – Question 10

Cross Tabulation: Project experience / use of email in projects

#### Cross tabulation of questions:

**Q3:** How long is your project experience?

**Q10:** What tools/software do you use in order to manage projects you are involved in?

(1 – not often – 5 very often)

#### Cross tabulation: project experience / use of email in projects

	Q10.1.Email			Total
	3	4	5	
-	0	0	3	3
Q3 Under 1 year	0	0	12	12
1-3 years	0	3	21	24
3-5 years	0	3	9	12
5 years +	3	3	24	30
Total	3	9	69	81

#### Cross tabulation: project experience / use of cloud computing

	Q10.2.Cloud computing					Total
	1	2	3	4	5	
-	0	0	0	3	0	3
Q3. Under 1 year	0	0	3	6	3	12
1-3 years	0	3	9	9	3	24
3-5 years	0	3	0	3	6	12
5 years +	3	3	3	3	15	27
Total	3	9	15	24	27	78

#### Cross tabulation: project experience / use of MS Office pack or similar

	Q10.3.MS Office Pack / or similar					Total
	1	2	3	4	5	
-	0	0	0	0	3	3
Q3 Under 1 year	0	3	0	3	6	12
1-3 years	0	0	9	3	12	24
3-5 years	0	0	0	3	9	12
5 years +	3	0	3	9	15	30
Total	3	3	12	18	45	81

**Cross tabulation: project experience / use of instant messenger**

	Q10.4.Instant Messenger / Other					Total
	1	2	3	4	5	
-	0	0	0	0	3	3
Q3. Under 1 year	0	0	0	6	6	12
1-3 years	0	0	0	15	9	24
3-5 years	0	0	0	6	6	12
5 years +	3	6	6	3	12	30
Total	3	6	6	30	36	81

**Cross tabulation: project experience / use of mobile phones**

	Q10.5.Mobile phone / Smartphone					Total
	1	2	3	4	5	
-	0	0	0	0	3	3
Q3 Under 1 year	3	0	3	3	3	12
1-3 years	3	3	9	3	6	24
3-5 years	3	0	3	3	3	12
5 years +	3	3	6	0	18	30
Total	12	6	21	9	33	81

**Cross tabulation: project experience /use of social media**

	Q10.6.Social Media					Total
	1	2	3	4	5	
-	0	3	0	0	0	3
Q3. Under 1 year	6	3	0	0	3	12
1-3 years	6	12	0	3	3	24
3-5 years	6	3	0	3	0	12
5 years +	21	6	3	0	0	30
Total	39	27	3	6	6	81

**Cross tabulation: project experience / use of personal communication**

	Q10.7.Personal conversation /meeting				Total
	2	3	4	5	
-	0	0	0	3	3
Q3. Under 1 year	0	3	3	6	12
1-3 years	0	0	6	18	24
3-5 years	0	0	9	3	12
5 years +	3	6	0	21	30
Total	3	9	18	51	81

**Cross tabulation: project experience / use of collaboration tools**

	Q10.8.Cross collaboration tools					Total
	1	2	3	4	5	
-	0	0	0	0	3	3
Under 1 year	9	0	3	0	0	12
Q3. 1-3 years	6	6	12	0	0	24
3-5 years	0	6	0	3	3	12
5 years +	12	6	6	6	0	30
Total	27	18	21	9	6	81

**10.12 Cross Tabulation: Question 3 – Question 14**

**Cross tabulation of questions:**

**Q3:** How long is your project experience?

**Q14:** Which of the following tools/software contributed the most to the success of the project? (1 not important – 5 very important)

**Cross tabulation: project experience / email contribution to project**

	Q14.1.Email						Total
	-	1	3	4	5		
-	0	0	0	3	0	3	
Under 1 year	0	3	3	0	0	6	
Q3. 1-3 years	3	0	0	0	0	21	
3-5 years	0	0	0	3	3	6	
5 years and	0	0	0	3	12	15	
Total	3	3	3	6	18	48	

**Cross tabulation: project experience / cloud computing contribution to project**

	Q14.2.Cloud computing						Total
	-	1	2	3	4	5	
-	0	0	0	0	0	3	
Under 1 year	3	3	3	3	0	0	
Q3. 1-3 years	0	3	0	9	3	9	
3-5 years	0	0	0	0	9	3	
5 years and	0	6	6	3	3	12	
Total	3	12	9	15	15	27	

**Cross tabulation: project experience / MS office or other contribution to project**

	Q14.3.MS Office / other					Total
	-	1	3	4	5	
-	0	3	0	0	0	3
Under 1 year	3	3	6	0	0	12
Q3. 1-3 years	0	0	12	6	6	24
3-5 years	0	0	0	3	9	12
5 years and	0	0	15	6	9	30
Total	3	6	33	15	24	81

**Cross tabulation: project experience / instant messenger contribution to project**

	Q14.4.Instant Messenger/ Other						Total
	-	1	2	3	4	5	
-	0	0	3	0	0	0	3
Under 1 year	3	0	0	3	3	3	12
Q3. 1-3 years	0	0	0	6	6	12	24
3-5 years	0	3	0	0	6	3	12
5 years and	0	9	6	3	6	6	30
Total	3	12	9	12	21	24	81

**Cross tabulation: project experience / mobile phone contribution to project**

	Q14.5.Mobile phone							Total
	-	1	2	3	4	5		
-	0	0	0	3	0	0	0	3
Under 1 year	0	3	6	0	0	3	0	12
Q3. 1-3 years	3	0	0	6	6	9	0	24
3-5 years	0	0	3	0	6	0	3	12
5 years and	0	0	6	3	9	3	9	30
Total	3	3	15	12	21	15	12	81

**Cross tabulation: project experience / social media contribution to project**

	Q14.6.Social Media						Total
	-	1	2	3	5		
-	0	0	0	3	0	0	3
Under 1 year	0	3	6	0	3	0	12
Q3. 1-3 years	0	0	15	3	0	6	24
3-5 years	0	0	12	0	0	0	12
5 years and	3	0	18	9	0	0	30
Total	3	3	51	15	3	6	81

**Cross tabulation: project experience / personal meeting contribution to project**

	Q14.7.Personal meeting					Total
	-	2	3	4	5	
-	0	0	0	0	3	3
Under 1 year	3	0	0	3	6	12
Q3. 1-3 years	0	0	0	3	21	24
3-5 years	0	3	3	3	3	12
5 years and	0	0	3	6	21	30
Total	3	3	6	15	54	81

**Cross tabulation: project experience / cross collaboration contribution**

	Q14.8.Cross collaboration tools					Total
	-	1	2	3	4	
-	0	0	0	0	3	3
Under 1 year	3	9	0	0	0	12
Q3. 1-3 years	0	6	9	9	0	24
3-5 years	0	3	3	3	3	12
5 years and	0	15	3	12	0	30
Total	3	33	15	24	6	81

**10.13 Cross Tabulation: Question 5 – Question 9**

**Q5: Are you certified PM Q9: How confident are you using tools**

	Q9.1.Email		Total
	4	5	
-	0	3	3
Q5. No	6	51	57
Yes	0	21	21
Total	6	75	81

**Q5: Are you certified PM Q9: How confident are you using tools**

	Q9.2.Cloud computing				Total
	2	3	4	5	
-	0	0	3	0	3
Q5. No	3	15	15	24	57
Yes	0	3	9	9	21
Total	3	18	27	33	81

**Q5: Are you certified PM Q9: How confident are you using tools**

	Q9.3.MSOffice Pack / other			Total
	3	4	5	
-	0	0	3	3
Q5. No	6	21	30	57
Yes	6	6	9	21
Total	12	27	42	81

**Q5: Are you certified PM Q9: How confident are you using tools**

	Q9.4.Instant Messenger			Total
	3	4	5	
-	0	0	3	3
Q5. No	3	12	42	57
Yes	3	6	12	21
Total	6	18	57	81

**Q5: Are you certified PM Q9: How confident are you using tools**

		Q9.5.Mobile phone				Total
		1	3	4	5	
Q5.	-	0	0	0	3	3
	No	3	3	9	42	57
	Yes	0	6	3	12	21
Total		3	9	12	57	81

**Q5: Are you certified PM Q9: How confident are you using tools**

		Q9.6.Social Media				Total
		2	3	4	5	
Q5.	-	0	0	0	3	3
	No	6	6	21	24	57
	Yes	6	9	0	6	21
Total		12	15	21	33	81

**Q5: Are you certified PM Q9: How confident are you using tools**

		Q9.7.Personal conversation			Total
		3	4	5	
Q5.	-	0	0	3	3
	No	0	12	45	57
	Yes	3	3	15	21
Total		3	15	63	81

**Q5: Are you certified PM Q9: How confident are you using tools**

		Q9.8.Cross collaboration tools					Total
		1	2	3	4	5	
Q5.	-	0	0	3	0	0	3
	No	9	9	24	6	9	57
	Yes	3	3	9	6	0	21
Total		12	12	36	12	9	81

**10.14 Cross Tabulation: Question 5 – Question 14**

**Cross tabulation of questions:**

**Q5:** Are you certified in Project Management (PMP/CAPM/Education/Other)?

**Q10:** Which of the following tools/software contributed the most to the success of the project? (1 not important – 5 very important)

**Q5: Are you certified PM Q14: What tools contributed the most to success**

	Q14.1.Email						Total
	-	1	3	4	5		
Q5 -	0	0	0	0	3	0	3
No	3	3	3	3	9	36	57
Yes	0	0	0	3	6	12	21
Total	3	3	3	6	18	48	81

**Q5: Are you certified PM Q14: What tools contributed the most to success**

	Q14.2.Cloud computing						Total
	-	1	2	3	4	5	
Q5 -	0	0	0	0	0	3	3
No	3	6	9	9	15	15	57
Yes	0	6	0	6	0	9	21
Total	3	12	9	15	15	27	81

**Q5: Are you certified PM Q14: What tools contributed the most to success**

	Q14.3.MSOffice Pack / other					Total
	-	1	3	4	5	
Q5 -	0	3	0	0	0	3
No	3	3	15	15	21	57
Yes	0	0	18	0	3	21
Total	3	6	33	15	24	81

**Q5: Are you certified PM Q14: What tools contributed the most to success**

	Q14.4.Instant Messenger						Total
	-	1	2	3	4	5	
Q5 -	0	0	3	0	0	0	3
No	3	6	3	12	18	15	57
Yes	0	6	3	0	3	9	21
Total	3	12	9	12	21	24	81

**Q5: Are you certified PM Q14: What tools contributed the most to success**

	Q14.5.Mobile phone							Total
	-	1	2	3	4	5		
Q5 -	0	0	3	0	0	0	3	
No	3	3	12	6	15	12	57	
Yes	0	0	3	3	6	3	21	
Total	3	3	15	12	21	15	81	

**Q5: Are you certified PM Q14: What tools contributed the most to success**

	Q14.6.Social Media						Total
	-	1	2	3	5		
Q5 -	0	0	3	0	0	3	
No	3	3	36	6	3	57	
Yes	0	0	15	6	0	21	
Total	3	3	51	15	3	81	

**Q5: Are you certified PM Q14: What tools contributed the most to success**

	Q14.7.Personal conversation					Total
	-	2	3	4	5	
Q5 -	0	0	0	0	3	3
No	3	3	3	12	36	57
Yes	0	0	3	3	15	21
Total	3	3	6	15	54	81

**Q5: Are you certified PM Q14: What tools contributed the most to success**

	Q14.8.Cross collaboration tools					Total
	-	1	2	3	4	
Q5 -	0	0	0	0	3	3
No	3	21	12	18	3	57
Yes	0	12	3	6	0	21
Total	3	33	15	24	6	81



### 10.15 Cross Tabulation: Question 9 – Question 10

Cross tabulation: Confidence with email / use of email

#### Cross tabulation of questions:

**Q9:** How confident are you using the following tools? (1 not confident 5-very confident)

**Q10:** What tools/software do you use in order to manage projects you are involved in?

(1 – not often – 5 very often)

#### Cross tabulation: Confidence with email / use of email

		Q10.1.Email			Total
		3	4	5	
Q9.1.	4	0	3	3	6
	5	3	6	66	75
Total		3	9	69	81

#### Cross tabulation: Confidence with cloud computing / use of cloud computing

		Q10.2.Cloud computing					Total
		1	2	3	4	5	
Q9.2.	2	0	0	3	0	0	3
	3	0	6	3	0	6	15
	4	3	3	6	12	3	27
	5	0	0	3	12	18	33
Total		3	9	15	24	27	78

#### Cross tabulation: Confidence with MS Office / use of MS office

		Q10.3.MSOffice Pack /other					Total
		1	2	3	4	5	
Q9.3.	3	3	3	0	3	3	12
	4	0	0	9	3	15	27
	5	0	0	3	12	27	42
Total		3	3	12	18	45	81

#### Cross tabulation: Confidence with instant messenger / use of messenger

		Q10.4.Instant Messenger /Other					Total
		1	2	3	4	5	
Q9.4.	3	0	0	0	3	3	6
	4	3	3	0	6	6	18
	5	0	3	6	21	27	57
Total		3	6	6	30	36	81

**Cross tabulation: confidence with mobile phone / use of mobile phone**

		Q10.5.Mobile phone /Smartphone					Total
		1	2	3	4	5	
Q9.5.	1	3	0	0	0	0	3
	3	0	3	3	0	3	9
	4	0	0	6	0	6	12
	5	9	3	12	9	24	57
Total		12	6	21	9	33	81

**Cross tabulation: Confidence with social media / use of social media**

		Q10.6.Social Media					Total
		1	2	3	4	5	
Q9.6.	2	12	0	0	0	0	12
	3	9	6	0	0	0	15
	4	9	9	0	3	0	21
	5	9	12	3	3	6	33
Total		39	27	3	6	6	81

**Cross tabulation: Confidence with personal communication / use of personal communication**

		Q10.7.Personal conversation /meeting				Total
		2	3	4	5	
Q9.7.	3	0	0	3	0	3
	4	0	0	6	9	15
	5	3	9	9	42	63
Total		3	9	18	51	81

**Cross tabulation: Confidence with cross collaboration / use of cross collaboration**

		Q10.8.Cross collaboration tools					Total
		1	2	3	4	5	
Q9.8.	1	9	3	0	0	0	12
	2	6	3	3	0	0	12
	3	12	9	9	3	3	36
	4	0	0	3	6	3	12
	5	0	3	6	0	0	9
Total		27	18	21	9	6	81