IDENTIFYING MANAGEMENT ERRORS THAT LEAD TO FAILURE IN IT PROJECTS AND RECOMMENDATIONS FOR PROJECT MANAGERS

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ABSTRACT

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Master of Science in Information Technologies

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Information technology (IT) projects bring significant benefits to organizations if they are successful, but some IT projects face setbacks before or after delivery and fail. IT projects can fail for many reasons. This study reveals that most IT projects fail due to various reasons, including mismanagement of projects by IT project managers, lack of customers' knowledge of technical details, and lack of communication between the project owner and the project team. This study presents a literature review on the causes of failure in IT projects by examining online resources, which are scientifically accepted databases such as ProQuest and EBSCOhost, at the first stage. Afterward, a survey was conducted for people working in the IT sector to reveal the reasons for the failure of IT projects. This survey also tried to determine the management mistakes of IT project managers in their IT projects and other factors that lead them to failure. Finally, it was tried to make suggestions to the project managers to carry out their IT projects with minimum failure by identifying the issues that caused the failure of the IT projects and the management errors.

Keywords: Information technology, Project management errors, Project management

ÖZ

IT PROJELERİNDE BAŞARISIZLIĞA YOL AÇAN YÖNETİM HATALARININ BELİRLENMESİ VE PROJE YÖNETİCİLERİ İÇİN ÖNERİLER

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Aralık 2021,71 sayfa

Bilgi teknolojisi (BT) projeleri, başarılı oldukları takdirde kuruluşlara önemli faydalar sağlarlar, ancak bazı BT projeleri, teslimattan önce veya sonra aksiliklerle karşı karşıya kalır ve başarısız olurlar. BT projeleri birçok nedenden dolayı başarısız olabilir. Bu çalışmada, çoğu BT projesinin, BT proje yöneticileri tarafından projelerin yanlış yönetilmesi, müşterilerin teknik detaylara ilişkin bilgi eksikliği ve proje sahibi ile proje ekibi arasındaki iletişim eksikliği gibi çeşitli nedenlerden dolayı başarısız olduğu ortaya konmaktadır. Bu çalışma, ilk aşamada ProQuest ve EBSCOhost gibi bilimsel olarak kabul görmüş veritabanları olan çevrimiçi kaynakları inceleyerek BT projelerinde başarısızlık nedenleri hakkında bir literatür taraması sunmaktadır. Sonrasında, BT sektöründe çalışan kişilere yönelik IT projelerinin başarısızlık nedenlerini ortaya çıkarmaya yönelik bir anket yapılmıştır. Bu anket ile ayrıca BT proje yöneticilerinin BT projelerindeki yönetim hataları ve onları başarısızlığa götüren diğer faktörler belirlenmeye çalışılmıştır. Son olarak, BT projelerinde başarısızlığa neden olan hususlar ve yönetim hataları belirlenerek, proje yöneticilerine BT projelerini minimum başarısızlıkla yürütmeleri için önerilerde bulunulmaya çalışılmıştır.

Anahtar Kelimeler: Bilgi Teknolojileri, Proje yönetim hataları, Proje yönetimi.

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LIST OF SYMBOLS AND ABBREVIATIONS

ABBREVIATIONS

STD	STANDARD
STR	STRONGLY
IT	INFORMATION TECHNOLOGY
N.A.N.D	NEITHER AGREE nor DISAGREE

CHAPTER I

INTRODUCTION

Information technologies (IT) have become a vital part of success in almost every industry today. Businesses should implement technological and advanced systems to cope with their competitors. Technological developments and an increase in meeting human needs using technology have led IT projects to increase considerably. Faragasan et al. also support this idea by claiming that the IT industry is "continually growing and expanding, forcing the people who work in this domain to enhance their workflow and improve the software delivery methods, even those considered to be well-known within the industry constantly adapting through learning." (Fagarasan, Popa, Pisla, & Cristea, 2021, p. 1). Gartner estimates that spending on the IT industry will rise enormously in 2021 from around $3.6 trillion to $3.8 trillion in general (Gagliordi, 2020). In 2021, the most significant growth in the IT industry was predicted to be in enterprise software with an 8.8% annual growth rate (CRN, 2021). Furthermore, the global IT market is estimated to reach $11.8 trillion by 2025, according to Information Technology Global Market Report 2021: COVID-19 Impact and Recovery to 2030 (The Business Research Company, 2021).

Today, organizations use IT to reduce costs, increase performance and develop traditional producing systems. With IT projects, it is aimed that institutions and businesses complete their work faster, more effectively, and efficiently. Examples of IT projects are creating a website, renewing network infrastructure, buying new hardware products, or developing new software. The budgets allocated by states, institutions, and individuals for IT expenses have increased to carry out such projects. However, despite the rise in technological developments and investments, the success of IT projects has not increased at the same rate.

"Even though progress has been made in project management practices and methodologies, the high ratio of failure in IT projects continues" (Iriarte & Bayona,

2020, p. 50). Business leaders in IT projects expect success to drive their business processes, but strategies for successful IT projects still fail at an alarming rate (Lai, C., & Li, 2018). According to Westfall, since many businesses in most industries are based on an IT infrastructure, any failure in an IT project has a dynamo effect on the other industries (Westfall, 2020). It is stated that more than 70% of the IT projects experience fail either due to over budget or not being completed on time, both of which are mainly due to the lack of adequate IT strategies (Mohamed & Kaur, 2012). They claim that the failures are outcomes of mismanagement of IT projects. Project Management Institute (PMI) published a report in 2017 on this issue and found that 14% of projects in the IT industry fail. However, this optimistic percentage only shows total failures (Greene, The top 9 reasons for IT project failure: Is your project at risk?, n.d.). Among these projects, 31% did not meet the original goals and business intent, 43% did not finish within their initial budgets, and 49% did not complete their initially scheduled times (Project Management Institute, 2017). Again, these are all about IT project management errors. According to the 2018 IT Project Success Rates Survey Results, which has more optimistic results, the perceived IT project success rates are as follows: 52% of them were successful, 40% of them were challenged, 8% of them failed (Ambler, 2018). The last updated scientific data could be reached from this report published in 2018. Although there is much literature about project success, there are not many literature reviews (Iriarte & Bayona, 2020). The literature reviewed shows us that failure rates in IT projects are high, and one of the primary reasons for this failure is management-related factors. In other words, the IT projects that are managed better have higher achievements (Sánchez-Morcilio & Quiles-Torres, 2016).

In this study, failure reasons and management errors that lead to failure in IT projects are identified, and recommendations for project managers to conduct IT projects with minimum failure are made. An online survey was conducted to analyze these failure reasons with 450 IT sector employees living in Ankara and Istanbul. Among them, 161 participated in the survey who worked in the IT industry. These participants were reached via e-mail sent by Türkiye Bilişim Derneği.

As stated above, failures in IT projects are widespread in the industry. Since IT projects are very complicated and unique, different solutions can be implemented to prevent these failures. In other words, there is no single formula to succeed in IT

projects. Similarly, on the reasons for failures of IT projects, there have been several studies and research with different results in the literature. This study also identifies the obstacles that stand in the way of success in IT projects.

Moreover, recommendations to IT project managers were made considering the survey results conducted among IT employees. In short, this study aims to specify the reasons for IT project failures and IT project managers' role in these failures so that these failures can be prevented by avoiding the factors that lead to unsuccessful IT projects. Failures can happen in any project, but the main thing is to detect these errors in advance and prevent them with the proper methods. It is expected that this study will contribute to the prevention of failures in IT projects by detecting the reasons for failures.

CHAPTER II

LITERATURE REVIEW

In this study, it is argued that most IT projects fail because of various reasons such as mismanagement of IT project managers, lack of knowledge of technical details, and miscommunication between the project owner and project team. Literature review about causes of failures in IT projects researched by examining online sources that are scientifically accepted databases like ProQuest and EBSCOhost. Also, people working in the IT industry were surveyed about these reasons for failures. An attempt was made to identify IT project managers' management errors in IT projects and other factors that lead them to fail. Moreover, failure reasons and management errors that lead to failure in IT projects are identified, and recommendations for project managers to conduct IT projects with minimum failure are attempted to make

This chapter covers some of the essential general project elements and IT projects to understand IT projects intensely. Definitions of concepts are provided from different perspectives, and literature was reviewed on the topic of this study. A hierarchical approach was followed in this chapter. The chapter presents the terminology from general to specific.

First, IT projects were introduced, and then the terms "project", "project management", "IT", and "IT project" were defined. Finally, the importance of IT, benefits of IT, IT project management, duties and roles of IT project managers, standard project cycle in IT projects, IT project failures are mentioned by reviewing the literature.

2.1 WHAT IS A PROJECT?

To identify management errors that lead to failure in IT projects, it is necessary to start from the beginning, which is the definition of the project and how it works in general. A project is defined as a planned work or activity completed within a certain period, and it aims to achieve a specific purpose (Cambridge Dictionary, n.d.) in the Cambridge Dictionary as its most straightforward definition. According to Project Management Institute, "a project is a temporary endeavor undertaken to create a unique product or service" (2000, p. 170). They are temporary because projects have a specific date from the beginning to the end that is pre-determined. They are unique because each project is planned, designed, and conducted according to the customer's needs. This customer could be a person, a firm, an organization, or an institution.

Projects have common characteristics. These characteristics are as follows: they are operated by people, have limited resources, are executed according to a particular plan, and are controlled in every process (Project Management Institute, 2000). Projects are human-made endeavors serving human or company needs and requirements. They have limited resources basically because they have a specific lifetime. They are executed in line with a particular plan since they meticulously aim to meet people's needs. Finally, they are controlled in every phase and process because any mistake in any stage and process can easily lead that project to failure.

2.2 WHAT IS PROJECT MANAGEMENT?

It can be said that history is full of great projects, and there is a management process behind those great projects. For example, the Great Pyramid of Giza was one of those projects completed in 2570 BC, although how the Pharaohs built the pyramids in Egypt is still a mystery. According to ancient records, several managers worked before and during the building. It proves that there was a degree of planning, execution, and control involved in the management of this project (Haughey, 2010).

In today's era of technology, more and more firms, public institutions, organizations, and individuals are investing in projects, especially research and development and IT projects, which are dealt with in detail in the following sections. This, in turn, increases the importance of project management. Project management is now regarded as a new paradigm because human knowledge, increasing demand for

customized products, growing global marketplace for manufacturing, and increasing consumption of goods and services have been developing increasingly (Meredith & Mantel, 2006).

In general, project management uses all the necessary tools and techniques to do a project. It includes defining, categorizing, and materializing a project. More specifically, project management can be defined as applying knowledge, skills, tools, and techniques to project activities to meet the necessities of projects. For a successful project, initiative, plan, execution, control, and closure are requirements of project management (Project Management Institute, 2000). As a result, project management is a job that should not be done unsystematically. It is a job that seems simple but must be carried out regularly and planned from beginning to end.

2.3 WHAT ARE INFORMATION TECHNOLOGIES (IT)?

IT is an acronym of Information Technologies. Information here should not be confused with data. Instead, information refers to the information that comes out of measurement, experiment, observation, research, and intelligence. In general, information technologies mean technologies, applications, and services that collect, store, process, access, distribute, and preserve information or provide access to this information from anywhere. It is applying technology to solve problems in terms of business and organization (Slyter, 2019).

As Castagna and Bigelow state, "IT includes several layers of physical equipment (hardware), virtualization, management systems, automation tools, operating systems, other system software and applications used to perform essential functions" (2021, p. 1). To understand IT layers, it is necessary to define them very briefly:

- Hardware is the name given to visible devices in computer systems. Computers, servers, storages, routers, switches, and all other equipment are examples of hardware.
- Virtualization is converting existing physical resources into multiple logical units through software.
- Management Systems are responsible for continuous monitoring of the IT environment and necessary updates and operations.

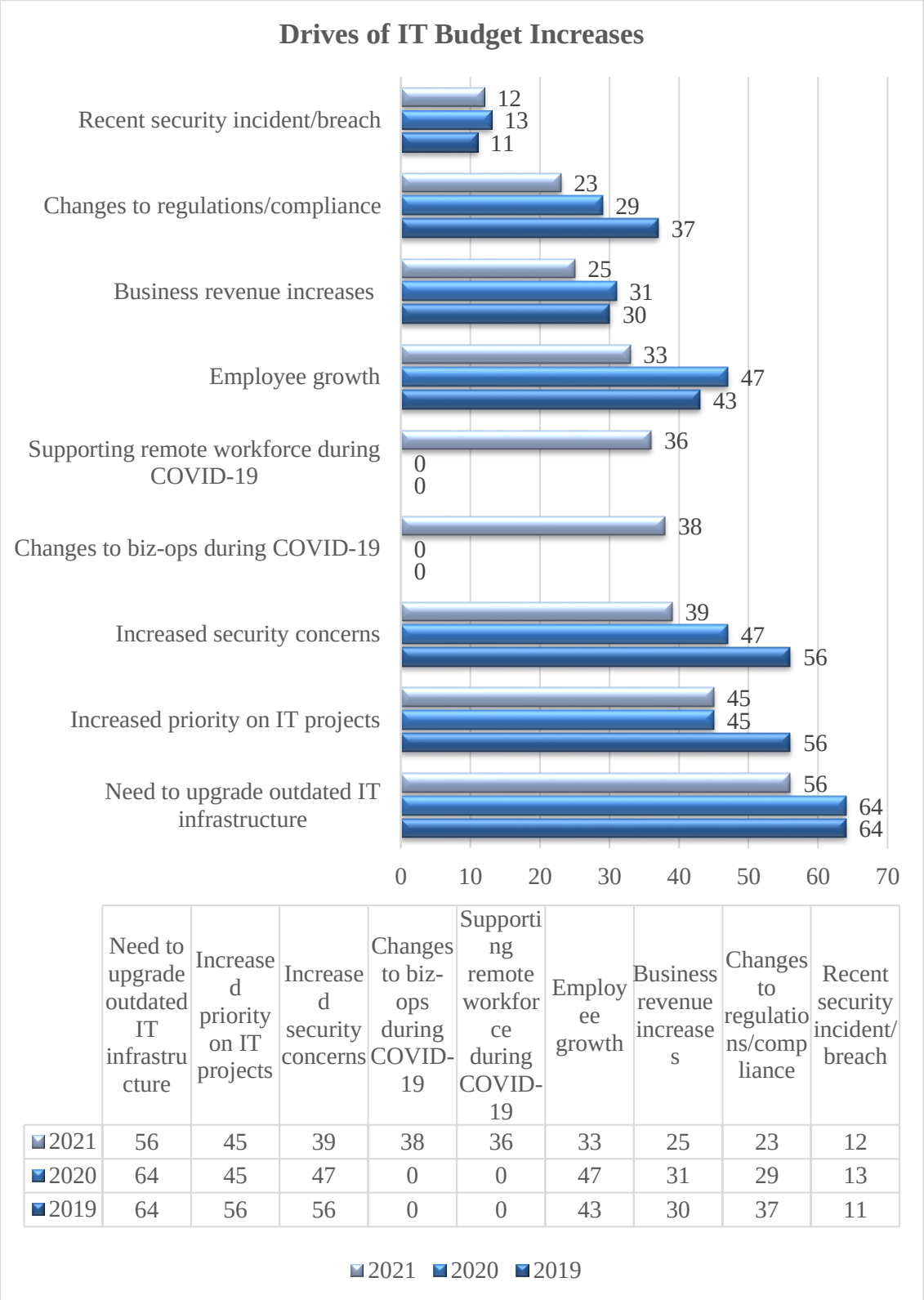
- Automation tools are being used to facilitate repeated processes and decrease manual interventions by a human.
- An operating system is a collection of programs that control the working of the application programs and the relationship between the user of a computer and the hardware of the computer.
- Software is divided into application software and system software. Application software is a type of software that communicates with the user through interfaces. System software communicates with computer hardware through codes that the machine can understand. As evident, IT is a very complex field consisting of different layers. Each layer is a whole other comprehensive area. That is why it requires more than one specialty for anyone to be in this industry.

2.4 WHY IT IS IMPORTANT?

IT (Information Technologies) covers the configuration, processing, creation, protection, and modification of digital data using any computer, storage tool, network, and other physical devices. It is often needed in the field of large organizations and commercial activities. Nowadays, it is very difficult, or even almost impossible, to find businesses that do not rely on computers and networks, which require information technologies (Slyter, 2019). Moreover, collecting data is very significant for industries. For businesses in different sectors, persisting competitively means collecting data and beneficially using that data. At this point, IT is something that enables businesses both to collect data and turn that data into useful information. Increasing the amount of data because there is unnecessary data and disinformation everywhere have made the need to process, analyze, and filter the valuable data. Businesses that can do these are the ones that are successful in competing with their rivals today. Therefore, without using IT efficiently, most organizations fail to remain competitive. In short, it can be said that IT is a determinant for the success of businesses today if used efficiently and productively.

Moreover, IT enables businesses to save their time in the short term and to use their resources effectively in the long term. That is why the budget companies spare for IT is increasing day by day in line with the success of these businesses. Spiceworks

defines nine drivers of IT budget increases for the years 2019, 2020, and 2021 as in the table below (Spiceworks Ziff Davis, 2020, pp. 5-6).



	Need to upgrade outdated IT infrastructure	Increased priority on IT projects	Increased security concerns	Changes to biz-ops during COVID-19	Supporting remote workforce during COVID-19	Employee growth	Business revenue increases	Changes to regulations/compliance	Recent security incident/breach
2021	56	45	39	38	36	33	25	23	12
2020	64	45	47	0	0	47	31	29	13
2019	64	56	56	0	0	43	30	37	11

Figure 2.1: SPICEWORKS, The 2021 State of IT: The Annual Report on IT Budgets and Tech Trends, Drivers of IT Budget Increases.

2.5 BENEFITS OF IT

Using information technologies come with benefits that increase the success of organizations. These can be sorted as follows (Boğaziçi Enstitüsü, 2020),

-Accelerating decision-making process: IT enables this process to progress faster and more accurately with the use of suitable and safe technology.

-Enabling to store valuable information quickly and safely: Access authorization to information is a precious factor for organizations, and storing that information enables both.

-Increasing strategic thinking ability: In a highly competitive environment, organizations, firms, institutions, etc., value strategic-thinking mechanisms to survive. Using IT paves the way for strategic thinking and thus success and increase in revenue.

-Increasing productivity: IT enables work to be done quickly, practically, and less costly.

-Enabling fast communication: The fact that data is processed and stored makes communication faster, primarily through electronic platforms.

-Decreasing costs: With the use of IT, productivity increases, and the decision-making mechanism accelerates. Moreover, since the transactions will be made with less error margin throughout the whole process, it also reduces the costs in terms of time and therefore labor.

2.6 WHAT IS IT PROJECT?

Information Technology projects can be of various types contrary to other projects in other industries. Mainly, IT projects are hardware or software-based. According to Schwalbe, some "involve a small number of people installing off-the-shelf hardware and associated software. Others involve hundreds of people analyzing several organizations' business processes and then developing new software in a collaborative effort with users to meet business needs. Even for small hardware-oriented projects, there is a wide diversity in the types of hardware that could be involved–personal computer, mainframe computers, network equipment, kiosks, or small mobile devices, to name a few" (Schwalbe, 2010, p. 63). Naturally, software-based information technology projects are more diverse than hardware-based

information technologies projects. They can be tailor-made according to the needs and requirements of that IT projects; thus, they can be developed in many different types.

With IT projects, starting with electricity and continuing with cabling, network continuity, server clustering, it is aimed to configure these clustered technologies to serve the required software or application. This means high availability. It can be reached 24 hours a day, seven days a week. As a result, if we classify these projects, types of projects are software or hardware-based, and both can be used together.

2.7 IT PROJECT MANAGEMENT

Cole defines IT project management as the process which includes "planning, organizing, and delineating responsibility for the completion of an organizations' specific information technology (IT) goals. IT project management includes overseeing projects for software development, hardware installations, network upgrades, cloud computing and virtualization rollouts, business analytics, and data management projects, and implementing IT services" (Cole, 2015, p. 1).

Managing an IT project has disadvantages as much as it has advantages. For example, it is disadvantageous because every IT project may have its unique steps to follow in managing it. Correspondingly, it becomes more challenging to measure risks since they may also be diverse and unique. Another disadvantage is that technology is expensive. IT projects are also costly for this reason. This means that the costs of the failures will also have financially high outcomes, which will lead to an extra burden on the shoulders of project managers. It is advantageous because institutions, firms, organizations, and NGOs demand/need IT projects to support their activities or business. This, in turn, increases the need for IT project managers in various fields.

However, since IT projects can be unique and diverse, IT project managers should know multiple areas to complete IT projects with fewer errors. Moreover, it is vital to find best practices or steps to follow while managing IT projects (Schwalbe, 2010).

2.8 DUTIES and ROLES OF IT PROJECT MANAGERS

IT project managers are the people who are responsible and authorized to manage a project. They conduct the project from the beginning until the end. This process includes planning, executing, monitoring, controlling, and concluding projects. Their role can be identified as a leading one. In other words, they lead every phase of a project. Inevitably, they must have some skills and qualifications to fulfill their duties and roles in IT project management. As stated in previous sections, when we consider "project", it includes many important details for its success. Thus, project management is vital for both project managers and their project teams. However, since every IT project is different, it is not an easy task nor a right thing to draw a general framework for IT managers' job descriptions. It can change according to projects and programs.

Because IT project managers have meetings before, during, and after the projects with the customers, they should have some skills. We can categorize these skills: communication skills, professional skills, and skills specific to the customers' project.

IT project managers need communication skills in several areas. They should know persuasion during the first meeting with the customer to get that project. Moreover, project managers should build trust between themselves and customers. In this way, the project management process can continue smoothly by keeping in touch with the customer more often. During the project, the project managers should motivate their team to show better performance. However, what is important is the success of the IT project and achieving the end that meets the end-user needs effectively and efficiently.

As stated in the previous sections, IT projects are different from other projects for several reasons. Firstly, they require knowledge of various fields simultaneously, such as hardware, software, network, virtualization, and other types of technology. In other words, many parameters should be considered to achieve success at the end of projects. Secondly and correspondingly, team members are generally of different backgrounds and have different skills and abilities, making IT projects more complex and more extensive than other projects. Thirdly, IT project managers should generally be the ones who have comprehensive knowledge of all the areas that are related to the

project. This is because organization and management skills in IT projects are not enough to complete successfully. They must understand the technical steps of each process because the result is either 1 or 0. Systems work or do not work; there is no other way.

2.9 PROJECT CYCLE IN IT PROJECTS

In general, a project life cycle consists of a set of phases in a specific project. According to Schwalbe, "Some organizations specify a set of life cycles for use on all of their projects, while others follow common industry practices based on the types of projects involved. In general, project life cycles what work will be performed in each phase, what deliverables will be produced and when, who is involved in each phase and how management will control and approve work produced in each phase" (Schwalbe, 2010, p. 57).

Small IT firms generally conduct projects relatively informally by applying their ways of completing IT projects. However, larger IT firms, follow a more formal way to proceed in IT projects, which led to a relative standardization in the IT project cycle. It is not to say that there is one way of conducting IT projects. On the contrary, IT projects completed in a standard project cycle are tailor-made since they are developed according to the needs and requirements of customers. The outcome of that IT project is always different, even unique. Green states that IT has brought a new and unprecedented dimension to the usual project management field (1989). Therefore, it is a challenge to standardize IT projects' life cycle.

2.10 IT PROJECT FAILURES

Kozak-Holland divides IT project failures into three categories as follows (Titanic Lessons for IT Projects, 2005, pp. 11-12):

1. Some projects are apparent failures, particularly those canceled or aborted during the project.
2. More critical failures are those projects that fail on or around implementation. The solution is already built and has undergone testing but fails while deployed.
3. The most critical failures occur weeks or months after the project is assumed to be complete. These are unpredictable, unexpected, and by far the costliest.

Some examples of IT project failures are specified below,

-Shared Services Transformation Program

This program was an IT project made for the Department of Transport in the UK. The result of this project was a failure because of its late delivery and high costs, which decreased the savings of the Department. "Because of poor project management, a project designed to save the department £57 million ended up costing it £80 million" (Greene, The top 9 reasons for IT project failure: Is your project at risk?, 2018, p. 1).

-Sydney Water

IBM Australia did a project for Sydney Water; however, the project's budget increased from 38 billion dollars to 138 billion dollars. Therefore, the project fails. The failure was attributed to the project's management team because "the board of Sydney Water and its senior executives had failed to effectively oversee or even 'understand the complexity of the project" (The Sidney Morning Herald, 2003). After the examinations, it was decided that the failure was mainly due to the institutional project management errors in IBM. In other words, the project failed because of management failures.

-FBI Virtual Case File

American Federal Bureau of Investigation wanted its case files to be virtualized with a project undertaken by Science Application International Corporation (SAIC). According to the contractor, they delivered the project before the due time; however, customers' demands changed often, and it caused the project to fail. However, according to the FBI, the project could not be completed on time due to budget. Moreover, it did not have the features that were designed to be. As a result, 170 million dollars were wasted (Marchewka, 2010).

CHAPTER III

METHODOLOGY

This study aims to specify the IT project failure causes and determine whether there is a relationship between management errors and failures. This study examined articles, reports, essays, recent studies, statistics, and analyzes. In this process, mainly IT projects that failed because of management errors have been analyzed. While research questions were prepared, similar surveys and sources were benefited. No survey questions were used directly. The resources used are indicated in the table below. Also, to give recommendations to IT projects managers, problems caused by their management were focused on, and questions were made accordingly. This chapter includes research questions, survey questions, research questions matrix, sampling design, and research design.

The research questions for this study are stated below:

Research Question 1: How do the project manager's competence and management skills affect the project's success?

H0: The project manager's competence and management skills directly impact the project's success.

H1: The project manager's competence and management skills do not directly impact the project's success.

Research Question 2: What are the most critical factors affecting the project failures?

Survey Questions	Research Question 1	Research Question 2
According to my experience, IT projects are generally delivered on time.		X
According to my experience, IT projects generally meet customer expectations.		X
Change in customers' demands affects IT projects' failure.		X
Unclear goals and objectives affect IT projects' failure.		X
Poor communication between customers and project team affect IT projects' failure.	X	X
Inexperienced project managers affect IT projects' failure.	X	X
Unwilling project team members affect IT projects' failure.		X
The most important role in an IT project belongs to the project manager.	X	
A good IT project manager can finish a project successfully no matter how bad his team is.	X	
IT projects fail due to the lack of knowledge of project owners.		X

Table 3.1: Survey Questions vs Research Questions Matrix

	Survey Questions	References
8	Have you ever been an IT Project Manager?	(Kendrick, 2009)
9	Have you ever been a Team Leader?	(Kendrick, 2009)
11	According to my experience, IT projects are generally delivered on time.	(Kendrick, 2009)
13	According to my experience, IT projects generally add value.	(Kendrick, 2009)
14.1	Please specify how much does change in customers' demands affects IT projects' failure.	(Project Management Institute, 2017)
14.3	Please specify how much does poor communication between customers and project team affects IT projects' failure.	(Project Management Institute, 2017)
14.4	Please specify how much-inexperienced project managers affect IT projects' failure.	(Project Management Institute, 2017)
14.5	Please specify how unwilling project team members affect IT projects' failure.	(Project Management Institute, 2017)

Table 3.2: Survey Questions vs References Matrix

3.1 PARTICIPANTS

This survey is developed for IT professionals only. Therefore, all participants were from the IT sector. Firstly, a pilot study of the questionnaire was conducted. 23 IT sector employees were selected purposefully to test the understandability of survey questions. These chosen people are involved in different departments, in various job titles. The participants agreed on the questions of the pilot study. Therefore, no questions have been changed. Thus, IT sector employees living in Ankara and Istanbul were selected as the target group. The survey's target group included male and female employers and employees working in the IT industry, both private and public. This population has been selected because they are the best target group to respond to this thesis's research questions. Turkish Informatics Association's administration sent invitation e-mails to its members in Ankara and Istanbul. We reached 450 participants. Among them, 161 participants participated in the survey. The survey was conducted online via Google Forms.

3.2 RESEARCH DESIGN

This study uses a descriptive research design with a quantitative approach by surveying employees and employers working in the IT industry. According to Gay, descriptive research design requires collecting data to test the accuracy of hypotheses or find answers to questions about the existing situation (Gay & Diehl, 1992). It is aimed to reveal the factors that affect the success of IT projects. The researcher designed the survey instrument in a structured way. In this process, questionnaires used in similar studies were used. In addition, new questions have been added to help answer the research questions. In this survey, an internet-based electronic survey was used. Thus, the data collected from the survey was used by describing the key features of common failures in IT projects. Descriptive research was used in this study to "describe systematically and accurately the facts and characteristics of" (Dulock, 1993, p. 154) the reasons for failures in IT projects

CHAPTER IV

RESULTS

4.1 ANSWERS TO THE SURVEY QUESTIONS

In this section, answers of 161 participants to the 25 survey questions are provided, and each question is analyzed according to these answers. The first nine questions are demographic questions and others are the questions aimed at understanding the causes of failures in IT projects. Tables showing the answers for each question are provided below.

4.1.1 Question 1

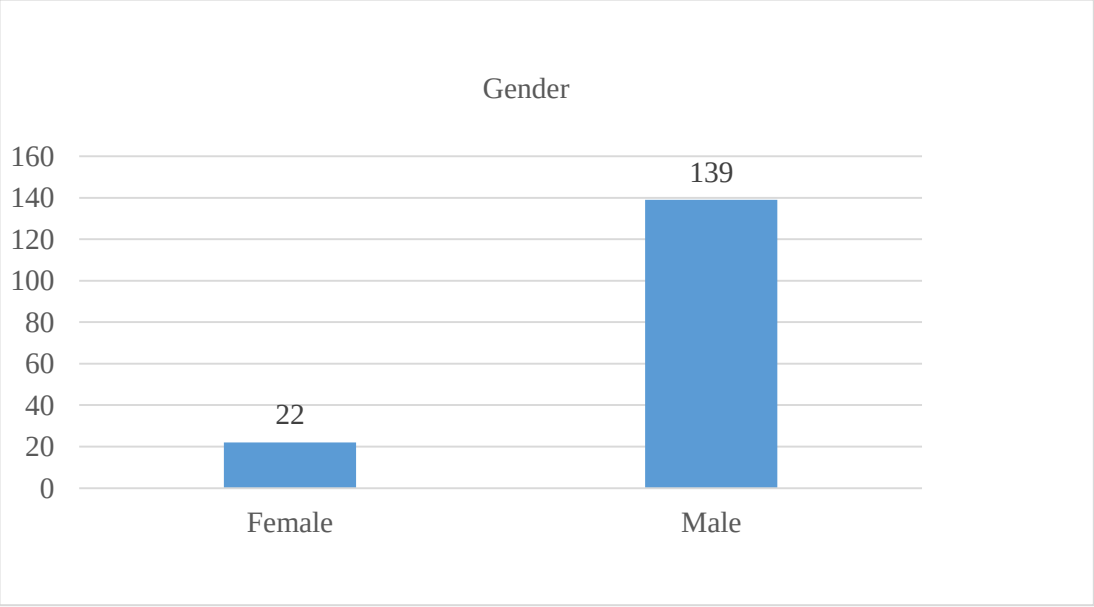


Figure 4.1: Gender of the participants

Among the participants, 22 of them are female, 139 are male.

4.1.2 Question 2

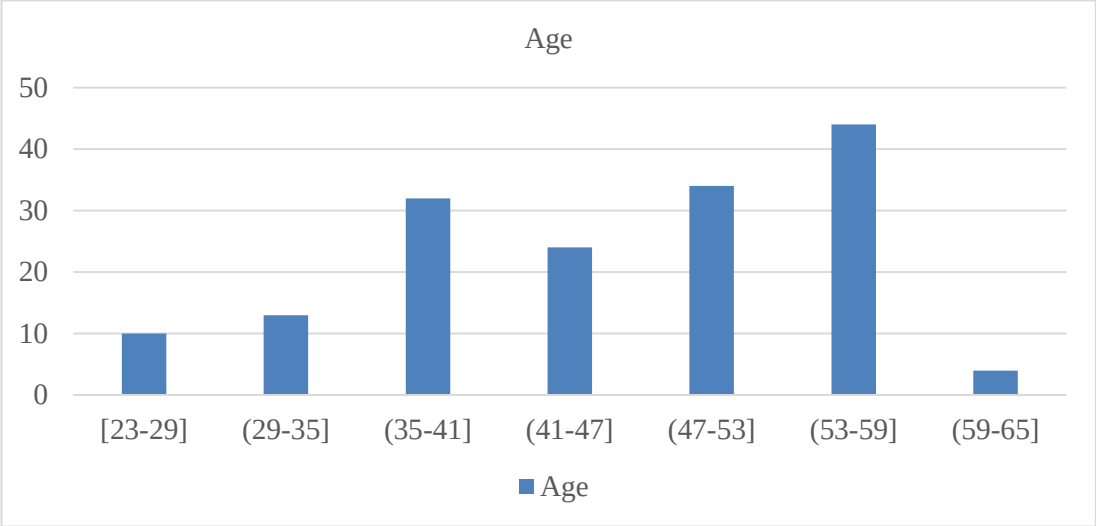


Figure 4.2: Age of the participants.

10 of the 161 participants are aged 23-29; 13 are 30-35, 32 are 36-41; 24 are 42-47, 34 are 48-53; 44 are 54.59; and 4 are in the age range of 60-65.

4.1.3 Question 3

Figure 4.3: Type of ownership of the organization the participants are working/worked.

Of the 161 participants, 118 work in private institutions, 17 work in mixed enterprises, 15 work in public institutions, and 11 work in foreign capital enterprises.

4.1.4 Question 4

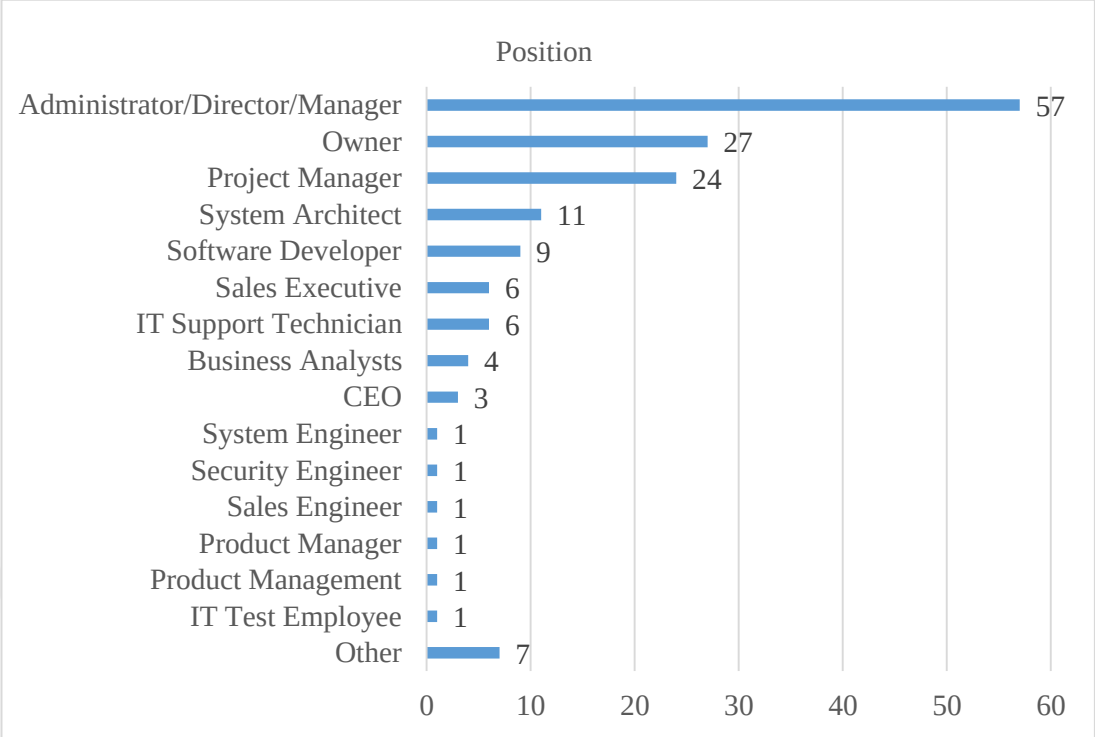


Figure 4.4: Participants' positions at IT industry.

When 161 participants were asked about their position at work, it is found out that there are 57 Administrator/Director/Manager, 27 owners, 24 Project Manager, 11 System Architect, 9 Software Developer, 6 sales executives, 6 IT Support Technician, 4 Business Analyst, 3 CEO, 1 system engineer, 1 Security Engineer, 1 Sales Engineer, 1 Product Manager, 1, Product Management, 1 IT Test Employee, 7 Other among the participants.

4.1.5 Question 5

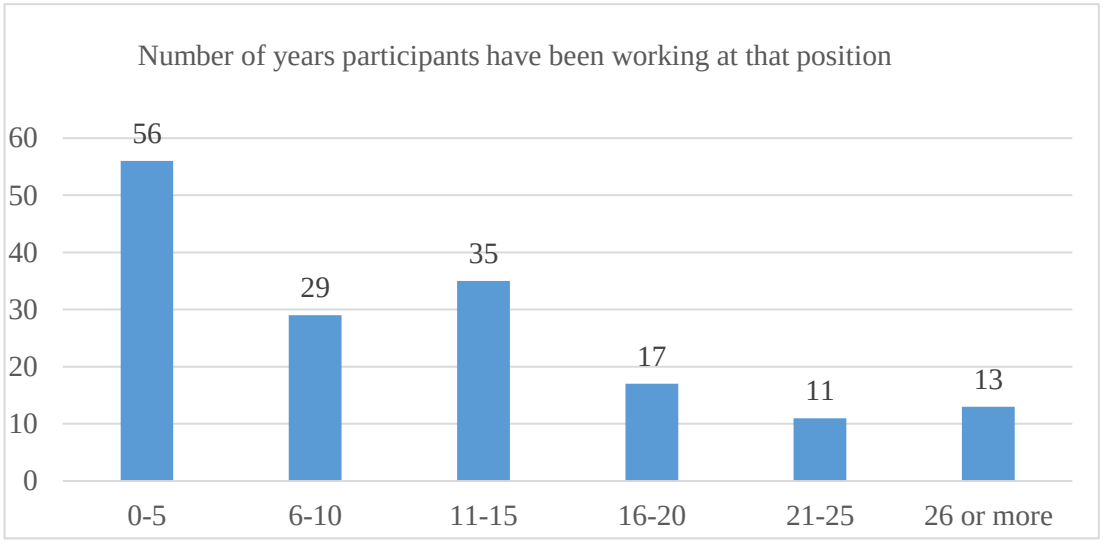


Figure 4.5: Number of years participants have been working at that position.

When 161 participants were asked how many years they had been working in the position mentioned above, 56 people answered that they had been working for 0-5, 29 people for 6-10, 35 people for 11-15, 17 people for 16-20, 11 people for 21-25, and 13 people for 26 or more years.

4.1.6 Question 6

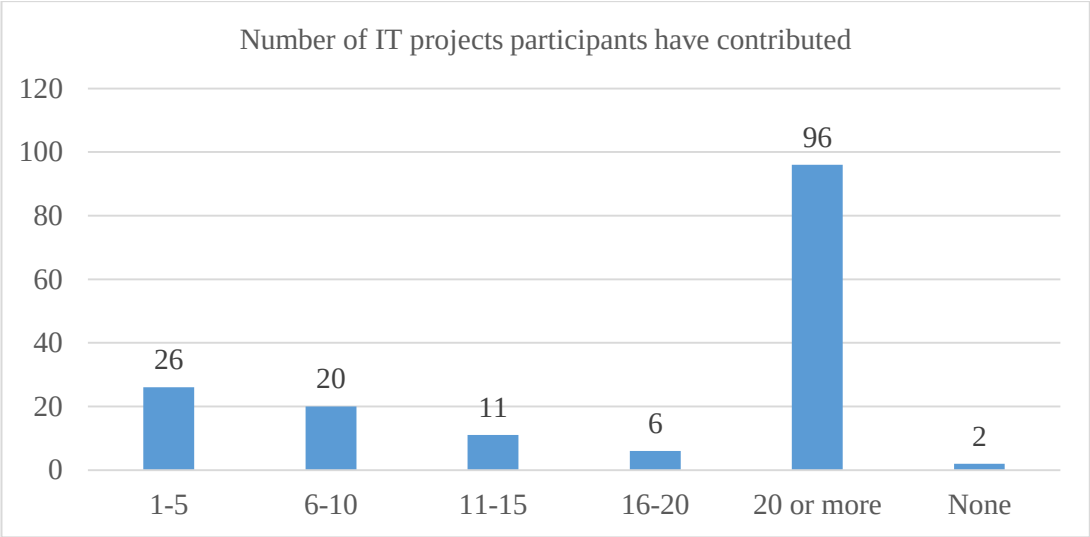


Figure 4.6: Number of IT projects participants have contributed.

161 participants were asked about the number of projects they contributed to, 26 people said that they contributed to 0-5, 20 people to 6-10, 11 people to 11-15, 6 people to 16-20, 11 people to 21-25, 96 people to 20 or more projects, and 2 people specified they did not contribute to any project.

4.1.7 Question 7

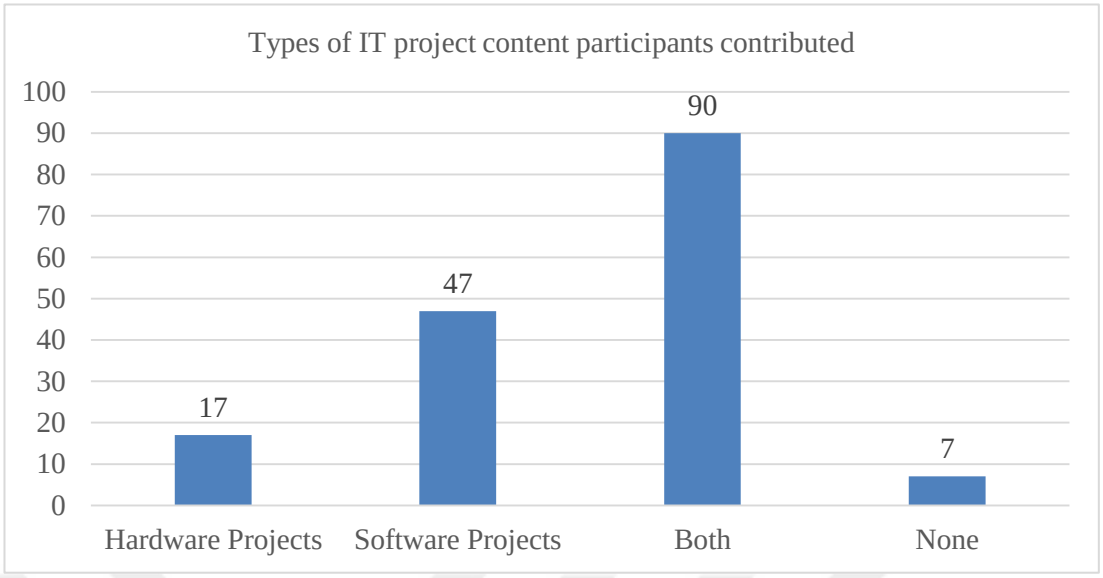


Figure 4.7: Types of IT project content participants contributed.

When 161 participants were asked about the project content they contributed to, 17 of them stated that they contributed to hardware projects, 47 to software projects, 90 to both, and 7 of them stated that they did not contribute to any of them.

4.1.8 Question 8

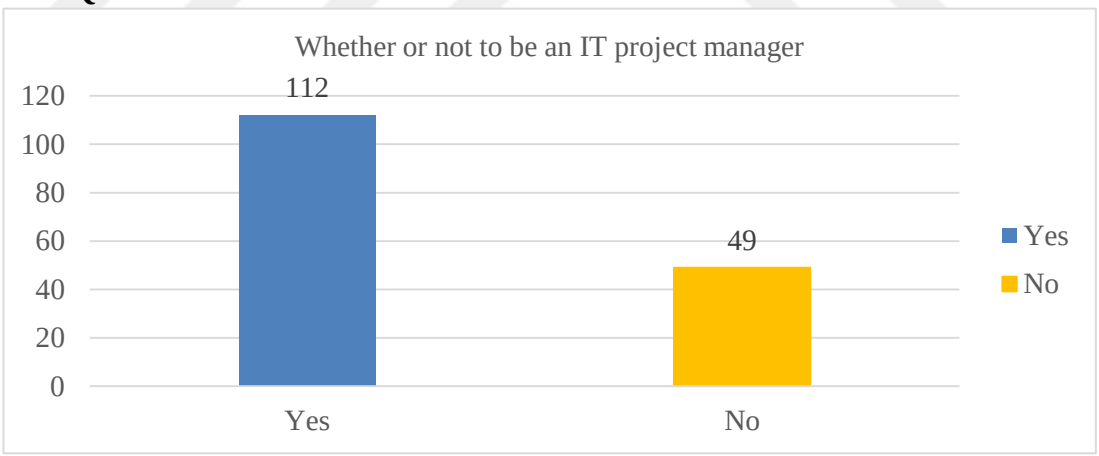


Figure 4.8: The situation of being a project manager.

112 of the 161 participants stated that they worked as a project manager while 49 stated that they did not work as an IT project manager.

4.1.9 Question 9

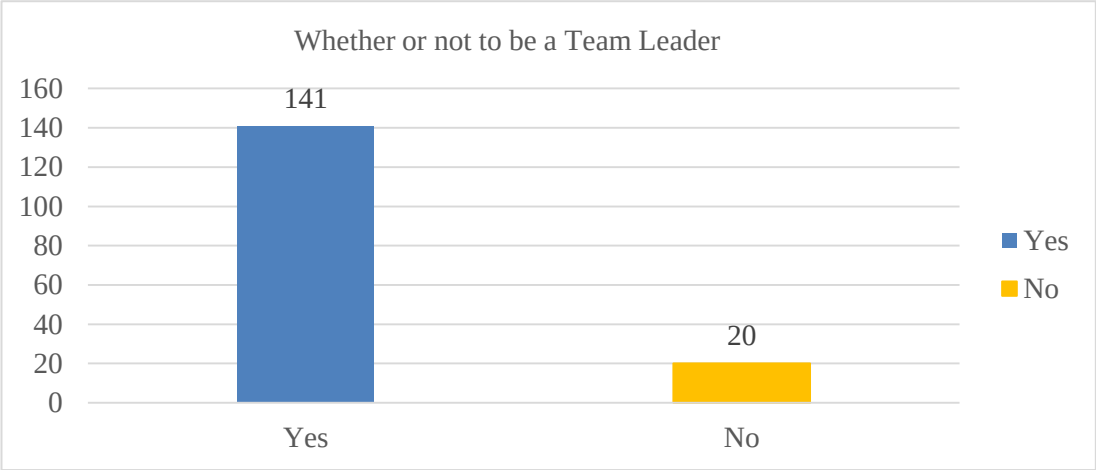


Figure 4.9: The situation of being a team leader.

141 of the 161 participants stated that they worked as a team leader while 20 stated that they did not.

4.1.10 Question 10

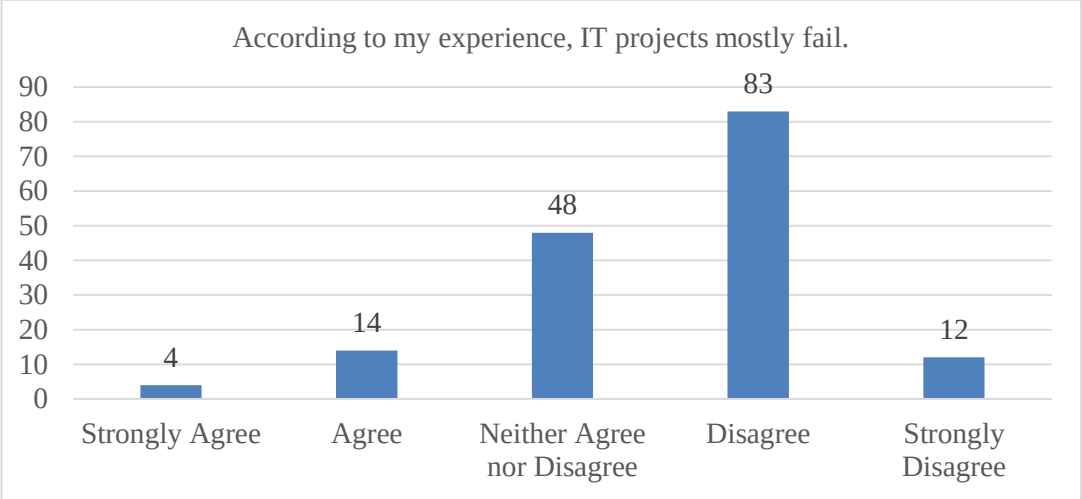


Figure 4.10: According to my experience, IT projects mostly fail.

Descriptive Statistic	N	Minimum	Maximum	Mean	Std. Deviation
According to my experience, IT projects mostly fail.	161	1.0	5.0	**2.472**	.8519

Table 4.10: Result of according to my experience, IT projects mostly fail.

1.0= Str Disagree **2.0= Disagree 3.0= N.A.N.D** 4.0= Agree 5.0= Str. Agree

Out of 161 participants, 4 strongly agree that IT projects mostly fail, 14 agree, 48 are undecided, 83 disagree, 12 strongly disagree.

4.1.11 Question 11

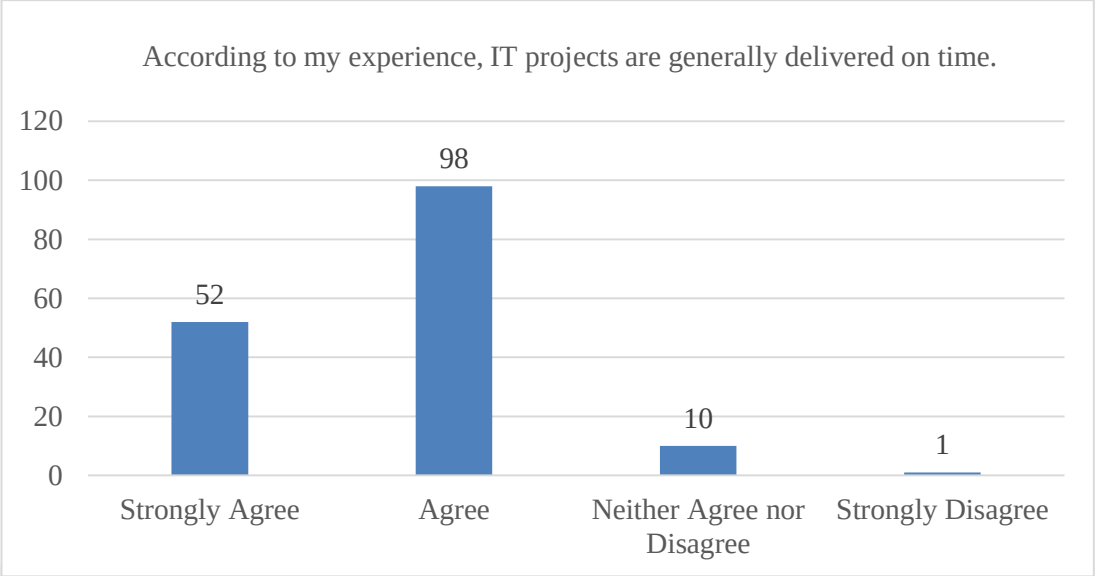


Figure 4.11: According to my experience, IT projects are generally delivered on time.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
According to my experience, IT projects are generally delivered on time.	161	1.0	5.0	**2.602**	.9571

Table 4.11: Result of IT projects are generally delivered on time.

1.0= Str Disagree **2.0= Disagree 3.0= N.A.N.D** 4.0= Agree 5.0= Str. Agree

Out of 161 participants, 52 strongly agree that IT projects are generally delivered on time, 98 agree, 10 are undecided, 1 strongly disagree..

4.1.12 Question 12

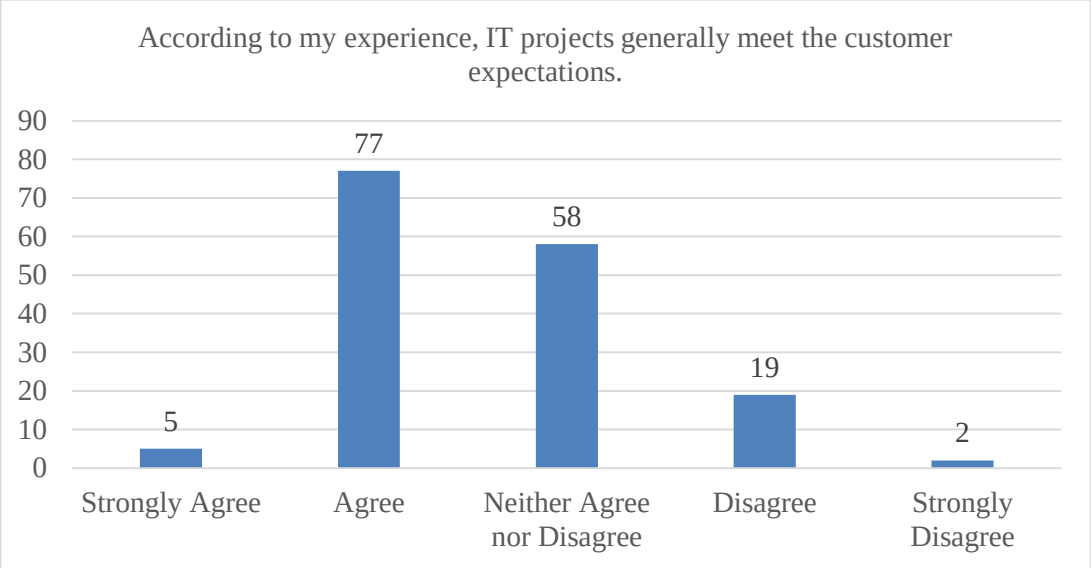


Figure 4.12: According to my experience, IT projects generally meet the customer expectations.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
According to my experience, IT projects generally meet customer expectations.	161	1.0	5.0	**3.398**	.7849

Table 4.12: Result of IT projects generally meet the customer expectations.

1.0= Str. Disagree 2.0= Disagree **3.0= N.A.N.D 4.0= Agree** 5.0= Str. Agree

Out of 161 participants, 5 strongly agree that IT projects generally meet the customer expectations, 77 agree, 58 are undecided, 19 disagree, 1 strongly disagrees.

4.1.13 Question 13

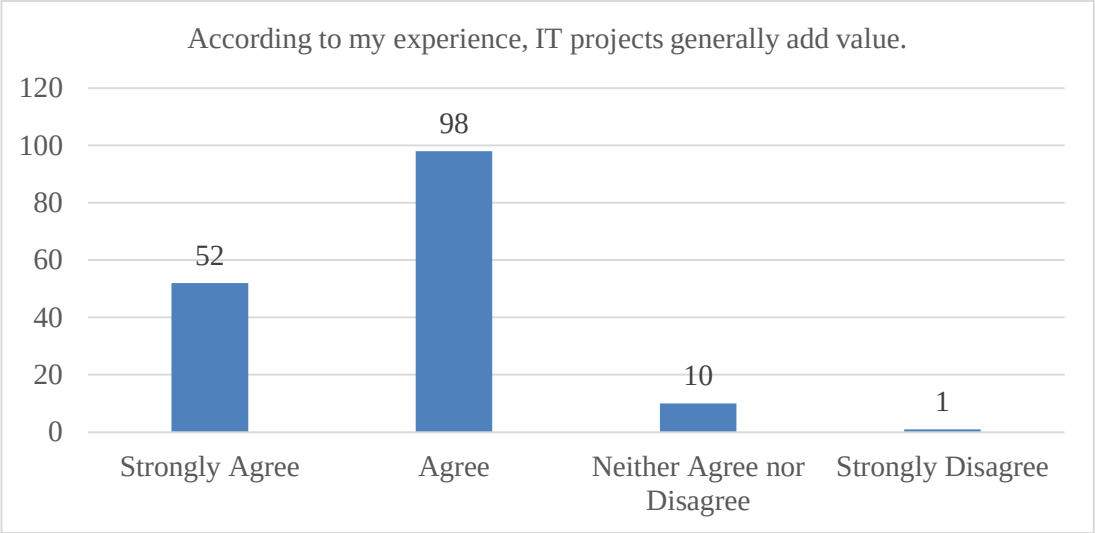


Figure 4.13: According to my experience, IT projects generally add value.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
According to my experience, IT projects generally add value.	161	1.0	5.0	**4.242**	.6202

Table 4.13: Result of IT projects generally add value.

1.0= Str. Disagree 2.0= Disagree 3.0= N.A.N.D **4.0= Agree 5.0= Str. Agree**

Out of 161 participants, 52 strongly agree that IT projects generally add value, 98 agree, 10 are undecided, 1 strongly disagree.

4.1.14 Question 14

This question consists of 5 different items.

4.1.14.1 Question 14.1

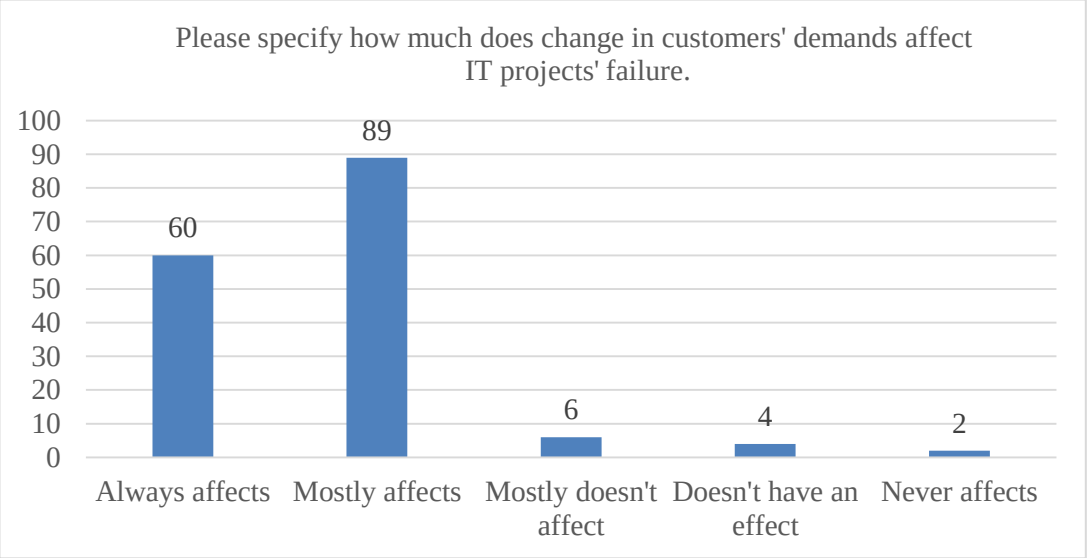


Figure 4.14: Change in customers' demands affect IT projects' failure.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Please specify how much do the following reasons affect IT projects' failure. [Change in customers' demands]	161	1.0	5.0	**4.236**	.7787

Table 4.14: Result of change in customers' demands affect IT projects' failure.

1.0= Str. Disagree 2.0= Disagree 3.0= N.A.N.D **4.0= Agree 5.0= Str. Agree**

Out of 161 participants, 60 think that the change in customers' demands always affects IT projects' failure, 89 think it mostly affects, 6 think it mostly does not affect, 4 think that it does not have an effect and 2 think that it never affects

4.1.14.2 Question 14.2

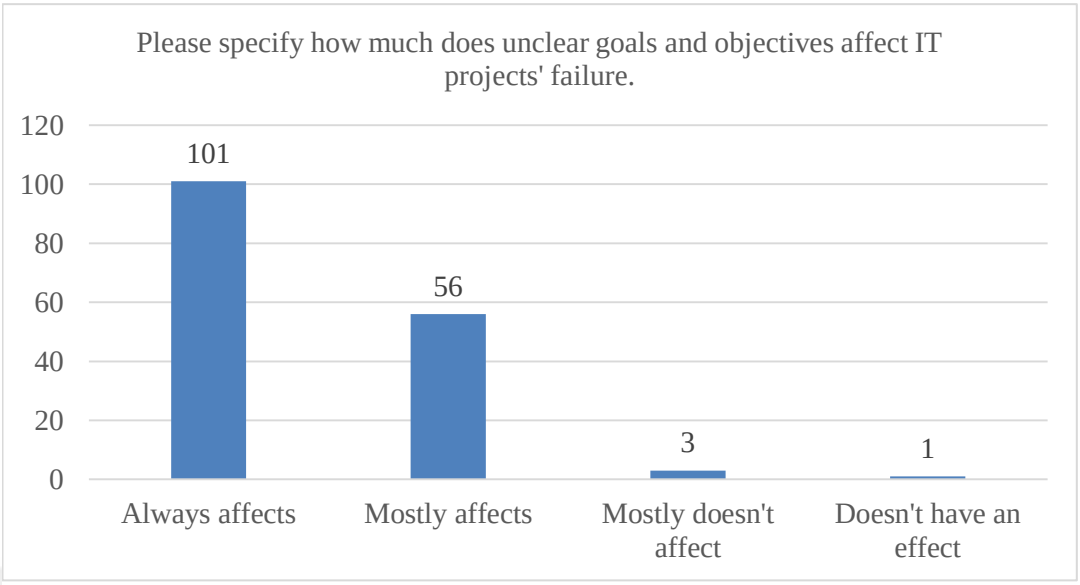


Figure 4.15: Unclear goals and objectives affect IT projects' failure.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Please specify how much do the following reasons affect IT projects' failure. [Unclear goals and objectives]	161	2.0	5.0	**4.584**	.6079

Table 4.15: Result of unclear goals and objectives affect IT projects' failure.

1.0= Str. Disagree 2.0= Disagree 3.0= N.A.N.D **4.0= Agree 5.0= Str. Agree**

Out of 161 participants, 101 think that unclear goals and objectives always affects IT projects' failure, 56 think it mostly affects, 3 think it mostly does not affect, 1 thinks that it does not have an effect.

4.1.14.3 Question 14.3

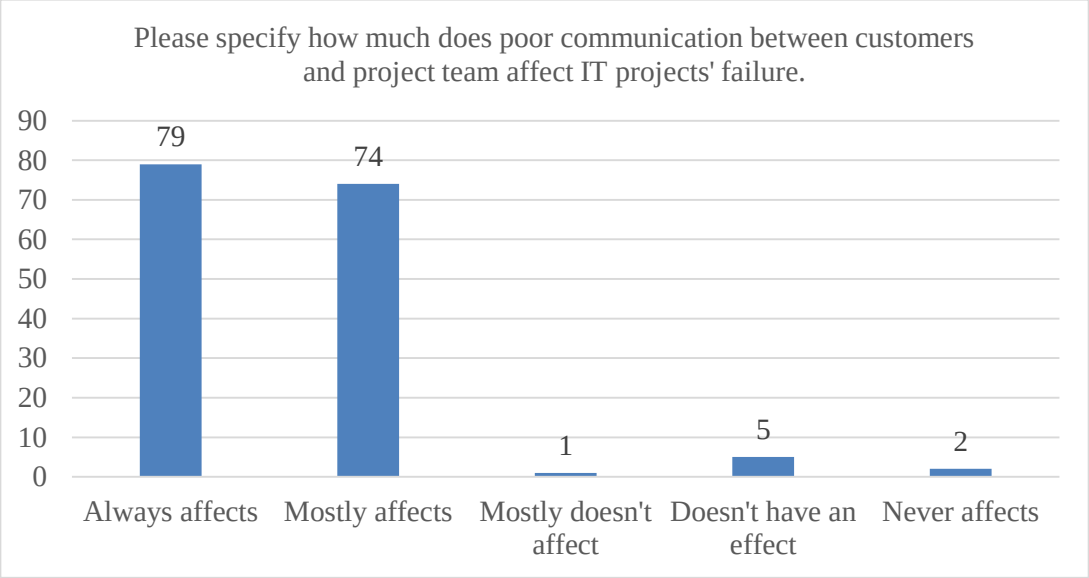


Figure 4.16: Poor communication between customers and project team affect IT projects' failure.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Please specify how much do the following reasons affect IT projects' failure. [Poor communication between customers and project team]	161	1.0	5.0	**4.410**	.7024

Table 4.16: Result of poor communication between customers and project team affect IT projects' failure.

1.0= Str. Disagree 2.0= Disagree 3.0= N.A.N.D **4.0= Agree 5.0= Str. Agree**

Out of 161participants, 79 think that poor communication between customers and project team always affects IT projects' failure, 74 think it mostly affects, 1 think it mostly does not affect, 5 think that it does not have an effect and 2 think that it never affects.

4.1.14.4 Question 14.4

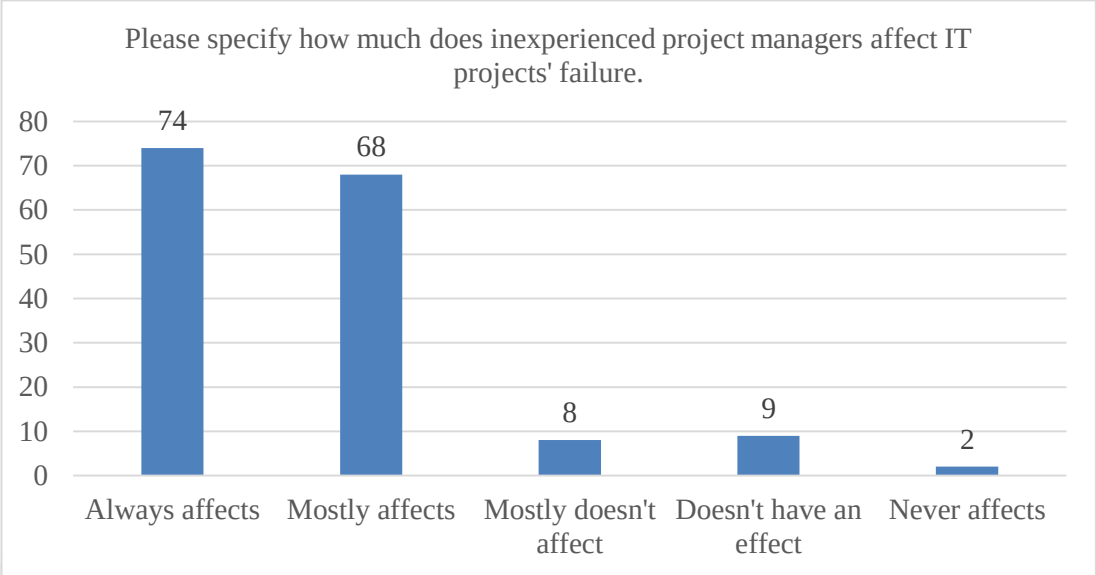


Figure 4.17: Inexperienced project managers affect IT projects' failure.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Please specify how much do the following reasons affect IT projects' failure. [Inexperienced project managers]	161	1.0	5.0	**4.267**	.8715

Table 4.17: Result of inexperienced project managers affect IT projects' failure.

1.0= Str. Disagree 2.0= Disagree 3.0= N.A.N.D **4.0= Agree 5.0= Str. Agree**

Out of 161 participants, 74 think that inexperienced project managers always affect IT projects' failure, 68 think it mostly affects, 8 think it mostly does not affect, 9 think that it does not have an effect and 2 think that it never affects.

4.1.14.5 Question 14.5

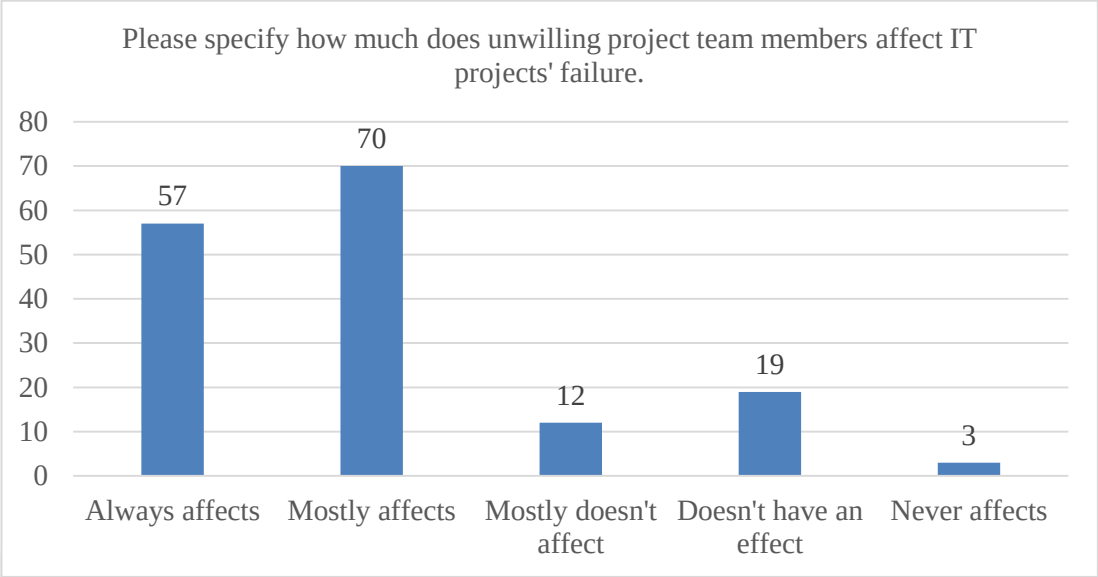


Figure 4.18: Unwilling project team members affect project's failure.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Please specify how much do the following reasons affect IT projects' failure. [Unwilling project team members]	161	1.0	5.0	**4.031**	.9710

Table 4.18: Result of unwilling project team members affect project's failure.

1.0= Str. Disagree 2.0= Disagree 3.0= N.A.N.D **4.0= Agree 5.0= Str. Agree**

Out of 161 participants, 57 think that unwilling project team members always affect IT projects' failure, 70 think that it mostly affects, 12 think that it mostly does not affect, 19 think that it does not have an effect and 3 think that it never affects

4.1.15 Question 15

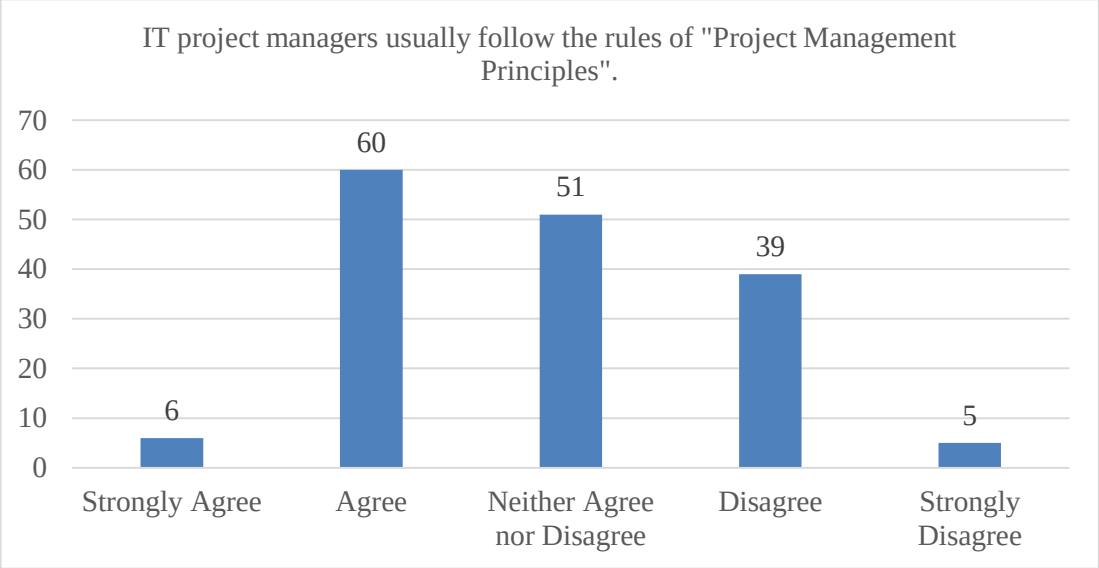


Figure 4.19: IT project managers usually follow the rules of "Project Management Principles"

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
IT project managers usually follow the rules of "Project Management Principles".	161	1.0	5.0	**3.143**	.9345

Table 4.19: Result of IT project managers usually follow the rules of "Project Management Principles"

1.0= Str. Disagree 2.0= Disagree **3.0= N.A.N.D 4.0= Agree** 5.0= Str. Agree

Out of 161 participants, 6 strongly agree that IT project managers usually follow the rules of "Project Management Principles", 60 agree, 51 are undecided, 39 disagree, and 5 strongly disagree.

4.1.16 Question 16

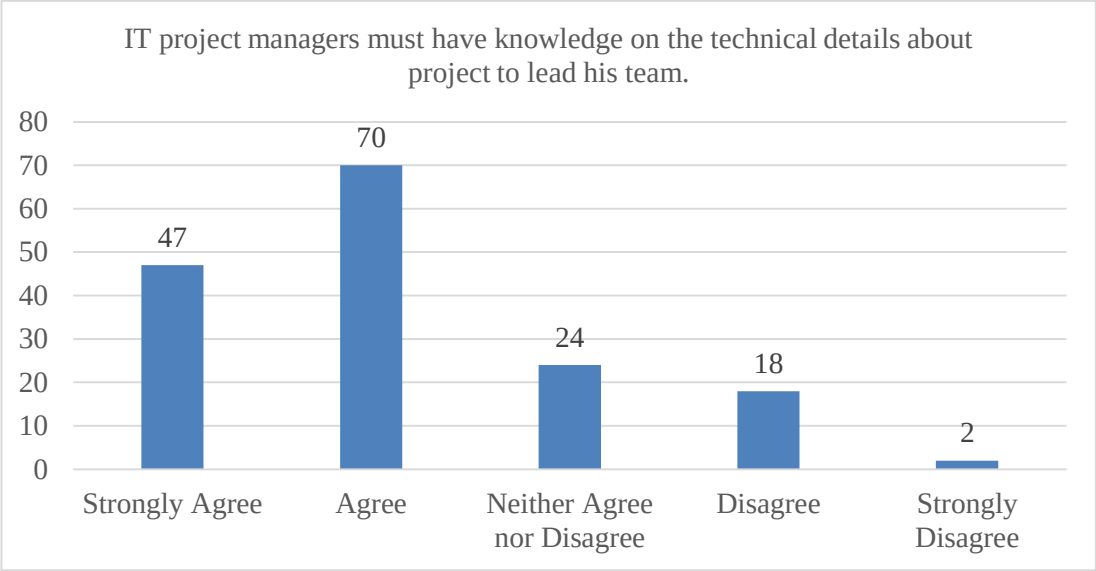


Figure 4.20: IT project managers must have knowledge on the technical details about project to lead his team.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
IT project managers must know the technical details of the project to lead their team.	161	1.0	5.0	**3.882**	.9961

Table 4.20:Result of IT project managers must have knowledge on the technical details about project to lead his team.

1.0= Str. Disagree 2.0= Disagree **3.0= N.A.N.D 4.0= Agree** 5.0= Str. Agree

Out of 161 participants, 47 strongly agree that IT project managers must know the technical details about the project to lead their team, 70 agree, 24 are undecided, 18 disagree, and 2 strongly disagree.

4.1.17 Question 17

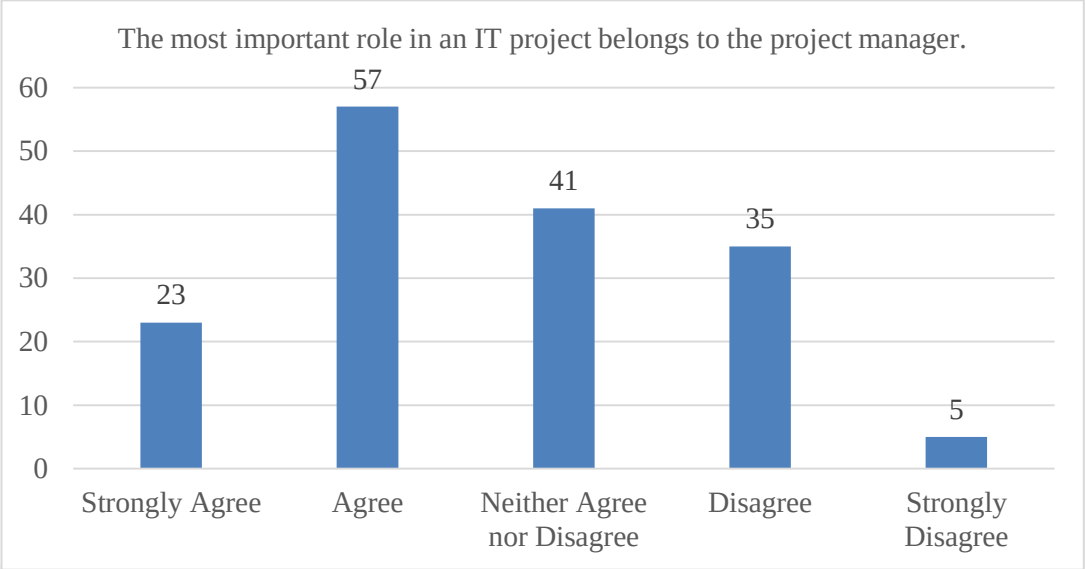


Figure 4.21: The most important role in an IT project belongs to the project manager.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
The most important role in an IT project belongs to the project manager.	161	1.0	5.0	**3.360**	1.0698

Table 4.21: Result of the most important role in an IT project belongs to the project manager.

1.0= Str. Disagree 2.0= Disagree **3.0= N.A.N.D 4.0= Agree** 5.0= Str. Agree

Out of 161 participants, 23 strongly agree that the most important role in an IT project belongs to the project manager, 57 agree, 41 are undecided, 35 disagree, and 5 strongly disagree.

4.1.18 Question 18

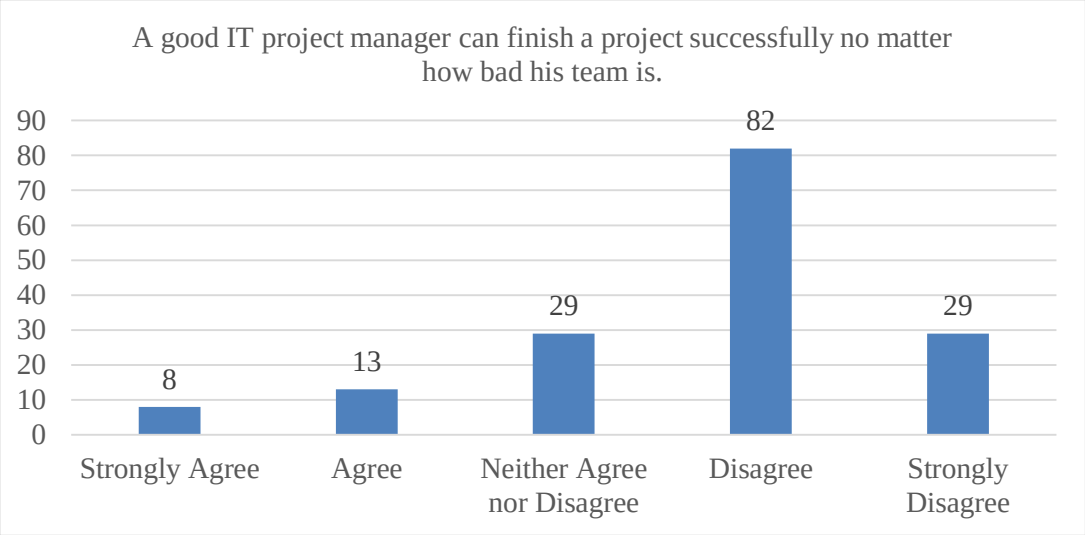


Figure 4.22: A good IT project manager can finish a project successfully no matter how bad his team is.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
A good IT project manager can finish a project successfully, no matter how bad his team is.	161	1.0	5.0	**2.311**	1.0200

Table 4.22: Result of a good IT project manager can finish a project successfully no matter how bad his team is.

1.0= Str Disagree **2.0= Disagree 3.0= N.A.N.D** 4.0= Agree 5.0= Str. Agree

Out of 161 participants, 8 strongly agree that a good IT project manager can finish a project successfully no matter how bad his team is, 13 agree, 29 are undecided, 4 disagree, and 29 strongly disagree.

4.1.19 Question 19

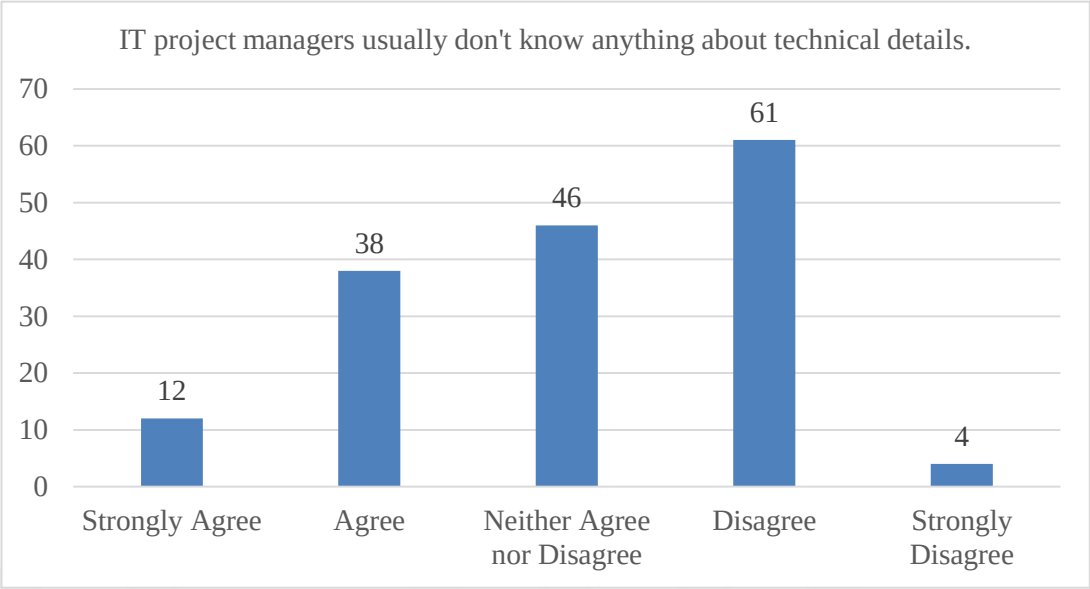


Figure 4.23: IT project managers usually don't know anything about technical details.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
IT project managers usually don't know anything about technical details.	161	1.0	5.0	**2.957**	1.0084

Table 4.23: Result of IT project managers usually don't know anything about technical details.

1.0= Str Disagree **2.0= Disagree 3.0= N.A.N.D** 4.0= Agree 5.0= Str. Agree

Out of 161 participants, 12 strongly agree that IT project managers usually don't know anything about technical details, 38 agree, 46 are undecided, 61 disagree, and 4 strongly disagree.

4.1.20 Question 20

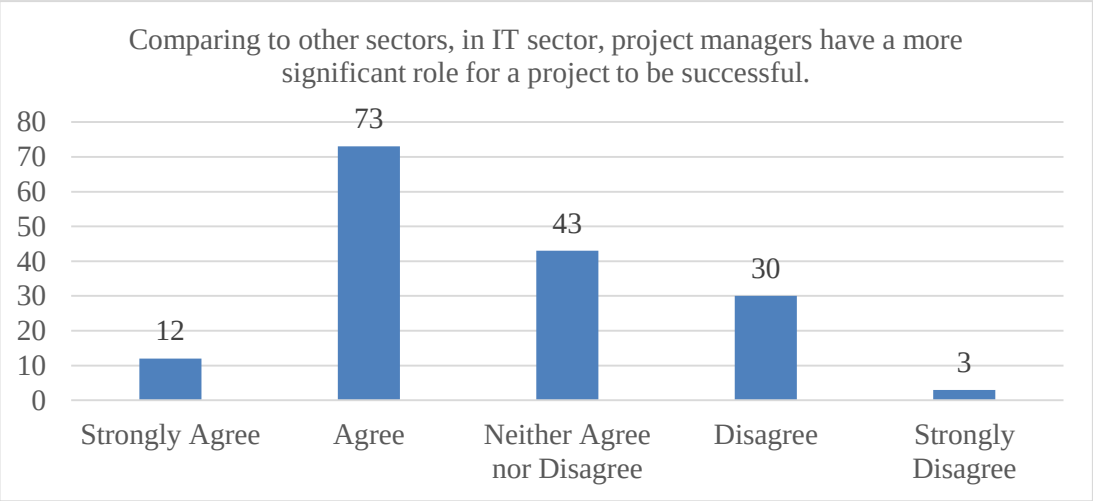


Figure 4.24: Comparing to other sectors, in IT sector, project managers have a more significant role for a project to be successful.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Compared to other sectors, in the IT sector, project managers have a more significant role for a project to be successful.	161	1.0	5.0	**3.379**	.9350

Table 4.24: Result of project managers have a more significant role for a project to be successful.

1.0= Str. Disagree 2.0= Disagree **3.0= N.A.N.D 4.0= Agree** 5.0= Str. Agree

Out of 161 participants, 12 strongly agree that IT project managers usually don't know anything about technical details, 38 agree, 46 are undecided, 61 disagree, and 4 strongly disagree.

4.1.21 Question 21

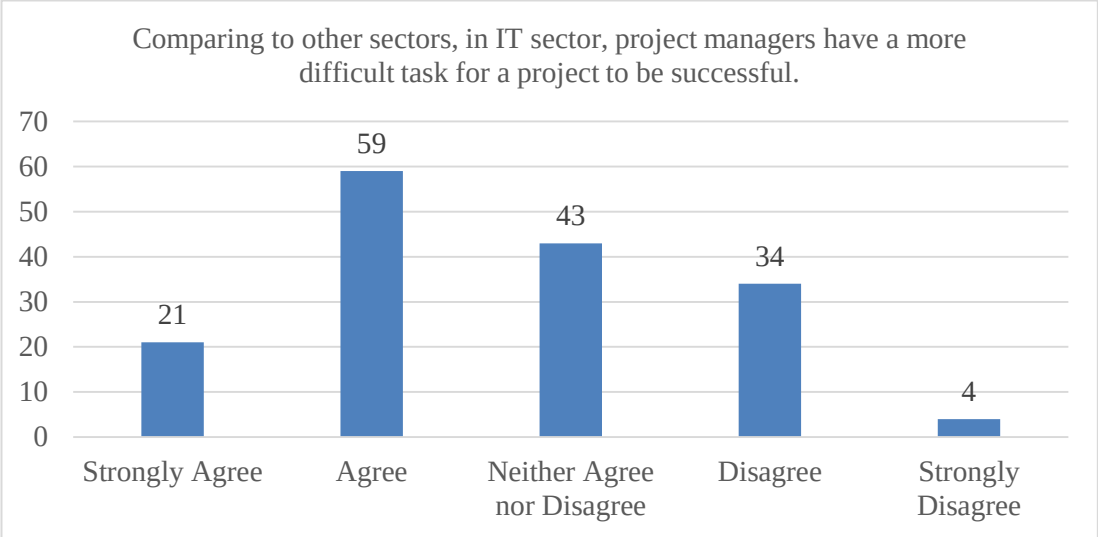


Figure 4.25: Comparing to other sectors, in IT sector, project managers have a more difficult task for a project to be successful.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Compared to other sectors, in the IT sector, project managers have a more difficult task for a project to be successful.	161	1.0	5.0	**3.366**	1.0349

Table 4.25: Result of project managers have a more difficult task for a project to be successful.

1.0= Str. Disagree 2.0= Disagree **3.0= N.A.N.D 4.0= Agree** 5.0= Str. Agree

Out of 161 participants, 21 strongly agree that compared to other sectors, in the IT sector, project managers have a more difficult task for a project to be successful, 59 agree, 43 are undecided, 34 disagree, and 4 strongly disagree.

4.1.22 Question 22

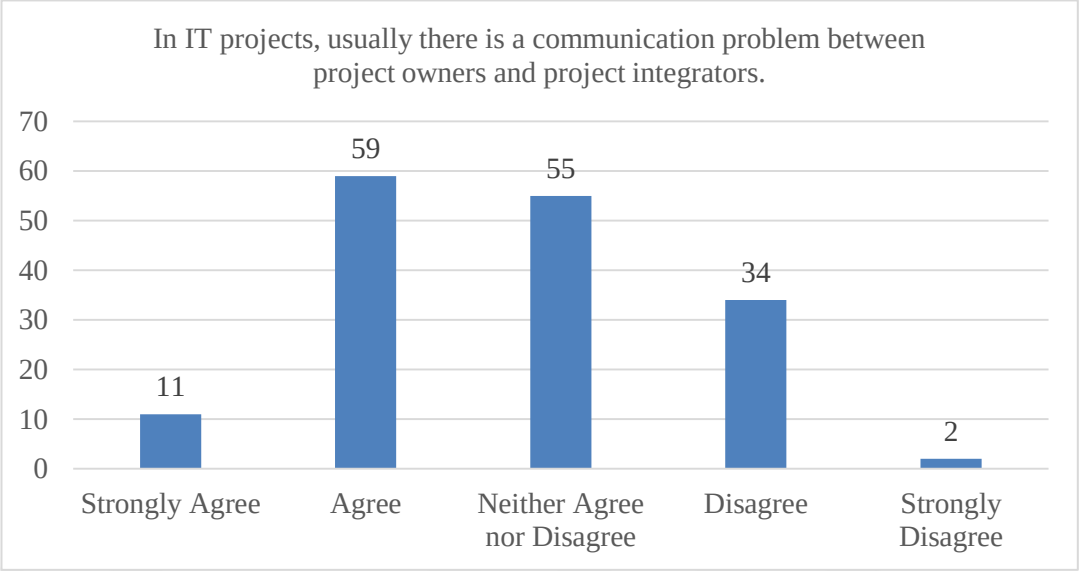


Figure 4.26: In IT projects, usually there is a communication problem between project owners and project integrators.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
In IT projects, usually, there is a communication problem between project owners and project integrators.	161	1.0	5.0	**3.267**	.9135

Table 4.26: Result of usually there is a communication problem between project owners and project integrators.

1.0= Str. Disagree 2.0= Disagree **3.0= N.A.N.D 4.0= Agree** 5.0= Str. Agree

Out of 161 participants, 11 strongly agree that in IT projects, usually there is a communication problem between project owners and project integrators, 59 agree, 55 are undecided, 34 disagree, and 2 strongly disagree.

4.1.23 Question 23

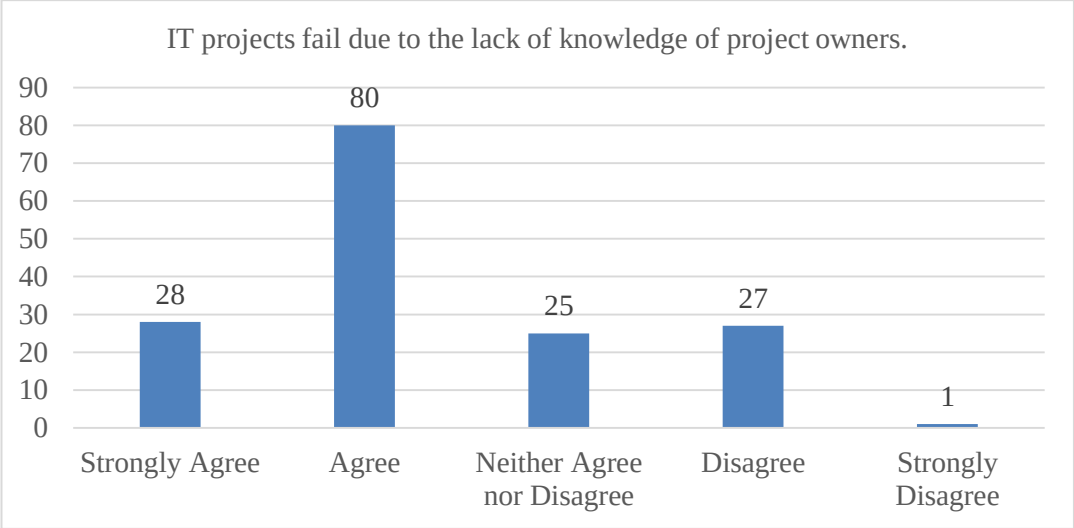


Figure 4.27: IT projects fail due to the lack of knowledge of project owners.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
IT projects fail due to the lack of knowledge of project owners.	161	1.0	5.0	**3.665**	.9743

Table 4.27: Result of IT projects fail due to the lack of knowledge of project owners.

1.0= Str. Disagree 2.0= Disagree **3.0= N.A.N.D 4.0= Agree** 5.0= Str. Agree

Out of 161 participants, 28 strongly agree that IT projects fail due to the lack of knowledge of project owners, 80 agree, 25 are undecided, 27 disagree, and 1 strongly disagree.

CHAPTER V

DISCUSSION

This study has been prepared to determine the factors that cause IT project failure and offer suggestions to project managers. In this study, first, a literature review was conducted. Then, a survey was applied to participants who have worked in the IT industry before and who have experienced IT project integration processes.

The first nine questions within the survey are about demographic information, which included gender, age, the ownership of organization the participants are working at, department, position, years of experience in the industry, the number of IT projects that contributed, IT content that contributed, and status of being an IT project manager and team leader. Out of 450 IT sector workers reached, 161 workers participated in the survey. 86% of the participants are men, and 14% are women. The average age of respondents is 42. These people have been working or have worked in the IT industry for an average of 23.1 years. Among the respondents, 27 are company owners, 3 are CEOs, 58 are managers, 24 are project managers, and the rest are working in other IT-related positions.

The job roles/positions included in this research are outlined below,

1. Boss, CEO
2. Administrator, Director, Manager
3. Project Manager
4. Programmer
5. IT support technician
6. Software developer
7. Sales Executive
8. Business analysts
9. Other

All these people listed above were engaged in at least one phase in an IT project.

73% of the participants work in private companies, 7% in foreign capital companies, 9% in public institutions, 11% in public-private mixed companies. Most of the participants are work in several different departments. When we examine the department-based participation ranking, we can see the following ranking,

1. Project management
2. Software development
3. Network and system management
4. Cybersecurity
5. Telecommunications
6. Technical support
7. Cloud computing
8. Hardware engineering
9. Database management
10 .Web development

60% of the respondents participated in more than 20 IT projects; the rest participated in less than 20 projects. Of these participating projects, 29% are software, 11% are hardware, and 56% are software and hardware projects. 70% of the participants were IT project managers, 30% did not. 88% of the participants became team leaders, 12% did not. Since the first nine questions are demographic questions, they are excluded from the discussion section.

Question 10: According to my experience, IT projects mostly fail.

When the answers are examined, most of the participants support the idea of "IT projects mostly succeed".

Question 11: According to my experience, IT projects are generally delivered on time.

When we examine question 10 in the survey, it is seen that the respondents do not think that IT projects are generally unsuccessful. However, in Question 11, it is seen that the majority of those who believe that IT projects are not delivered in the promised time. We can deduct from this that IT projects are delivered later, even if they are not finished at the specified time. Besides, many people have no idea about it.

Question 12: According to my experience, IT projects generally meet customer expectations.

When the answers given to the 12th question of the survey are examined, it is seen that IT projects are thought to meet the expectations of the customers in general. In addition, many people are indecisive about it.

Question 13: According to my experience, IT projects generally add value.

When the answers to the 13th question are examined, only one person thinks that IT projects do not add any value. According to the participants, this means that IT projects that are completed can add value.

Question 14:

Question 14 was asked in several items, and it was asked to what extent each item affected IT projects. The following five charts contain the answers to each item in this question.

Question 14.1: Please specify how much does change in customers' demands affects IT projects' failure. When we look at the 1st item of our 14th question, it is seen that the constant change in the expectations and wishes of the customer directly affects the success of the project.

Question 14.2: Please specify how much does unclear goals and objectives affect IT projects' failure.

Looking at item 2 of question 14, it is seen that the lack of clear indication of goals and objectives directly impacts the success of the project.

Question 14.3: Please specify how much poor communication between customers and project team affects IT projects' failure.

Looking at item 3 of question 14, it can be said that the poor communication between the customer and the project team is thought to have led to the project's failure. The project manager is the person who should provide communication between the customer and the project team. Here, the importance of the project manager is indirectly revealed, and it is seen that the project managers who cannot communicate can cause the failure of the project.

Question 14.4: Please specify how much-inexperienced project managers affect IT projects' failure.

Looking at item 4 of question 14, inexperienced project managers likewise directly affect the failure of the project.

Question 14.5: Please specify how unwilling project team members affect IT projects' failure.

When we examine the last item of our 14th question, we see that it is experienced that unwilling teammates also affect the project's failure.

In summary, the answers to Question 14 showed that the following are among the factors that affect the failure of IT projects,

• Constant change in the customer's expectations,

• Goals and objectives are not clearly stated,

• Miscommunication between the customer and the project team,

• Inexperienced project managers,

• Reluctant teammates.

Question 15: IT project managers usually follow the rules of "Project Management Principles".

When we ask whether IT project managers apply Project Management Principles, we see that the answers differ. Accurate analysis cannot be made for the 15th question, as most of the answers cannot be obtained.

Question 16: IT project managers must know the technical details about the project to lead their team.

When the answers to the 16th question are examined, it is seen that the majority of the participants think that the project managers must know the technical details about the project to lead their team.

Question 17: The most important role in an IT project belongs to the project manager.

Looking at the answers to question 17, it is seen that most of the respondents think that the most important role in the IT project is the IT project manager.

Question 18: A good IT project manager can finish a project successfully no matter how bad his team is.

In question 18, the majority do not think that the project manager can make the project successful despite his bad team.

Question 19: IT project managers usually don't know anything about technical details.

When we look at the answers given to the 19th question, it is seen that IT project managers are generally not thought to be knowledgeable about the technical details.

Question 20: Compared to other sectors, in the IT sector, project managers have a more significant role for a project to be successful.

Looking at the answers to question 20, it is seen that project managers in the IT sector are thought to have a more critical role in the success of the project when compared to other sectors.

Question 21: Compared to other sectors, in the IT sector, project managers have a more difficult task for a project to be successful.

In the answers to question 21, project managers in the IT sector are considered to have a more difficult task when compared to other sectors.

Question 22: In IT projects, usually, there is a communication problem between project owners and project integrators.

In question 22, it is understood that there is generally a miscommunication between project owners and project integrators in IT projects. The person who should provide the communication between the customer and the project integrator is the Project manager. Here, the importance of the project manager is revealed indirectly, and the impact of the project managers who cannot communicate on the failure of the project appears.

Question 23: IT projects fail due to the lack of knowledge of project owners.

It is understood from the answers given to question 23 that, according to the participants, the lack of knowledge of the project owners causes IT projects to fail.

Survey Questions	**Research Question 1** How do the project manager's competence and management skills affect the project's success?	**Research Question 2** What are the most critical factors affecting the project failures?
According to my experience, IT projects are generally delivered on time.		2.602/5
According to my experience, IT projects generally meet customer expectations.		3.398/5
Change in customers' demands affects IT projects' failure.		4.236/5
Unclear goals and objectives affect IT projects' failure.		4.584/5
Poor communication between customers and project team affect IT projects' failure.	4.410/5	4.410/5
Inexperienced project managers affect IT projects' failure.	4.267/5	4.267/5
Unwilling project team members affect IT projects' failure.		4.031/5
The most important role in an IT project belongs to the project manager.	3.360/5	
A good IT project manager can finish a project successfully no matter how bad his team is.	2.311/5	
IT projects fail due to the lack of knowledge of project owners.		3.665/5

To conclude, survey results showed that failure could be interpreted in different ways. According to the participants:

- IT projects are not generally delivered on time.
- IT projects generally meet the customer expectations, but a considerable number of participants are also hesitant about that.
- IT projects generally add value.
- Change in customers' demands always affects IT projects' failures.
- Unclear goals and objectives have always an effect on IT projects' failure.
- Poor communication between customers and project team affects IT projects' failure.
- Inexperienced project managers always affect IT projects' failure.
- Unwilling project team members mostly affects IT projects' failure.
- IT project managers usually follow the rules of project management principles.
- IT project managers must know technical details.
- IT project managers have the most important role in an IT project, but a considerable number of participants are also hesitant about that.
- Most of the participants do not think that a good IT project manager can finish a project successfully no matter how bad his team is.
- Participants are generally hesitant about the question about IT project managers usually do not know anything about technical details.
- Most of the participants agree on the question "comparing to other sectors, in IT sector, project managers have a more significant role for a project to be successful".
- Most of the participants agree on the question "comparing to other sectors, in IT sector, project managers have a more difficult task for a project to be successful".
- Most of the participants agree that in IT projects, usually there is a communication problem between project owners and project integrators, but a considerable number of participants are also hesitant about that.
- Most of the participants agree on the question "IT projects fail due to the lack of knowledge of project owners".

Table 5.1: Survey Questions vs Research Questions Matrix Results

This study has two research questions as stated above. Results are sorted by their mean values.

Research Question 1 (RQ1): How do the project manager's competence and management skills affect the project's success?

H0: The project manager's competence and management skills directly impact the project's success.

H1: The project manager's competence and management skills do not directly impact the project's success.

When we analyze the results according to the research questions, we conclude the study as follows;

- Poor communication between customers and project team affects IT projects' failure. Since the IT project manager is the one who maintains this communication, his/her communication skills are vital for the project's success. This result directly supports the **h0**, which is project manager's competence and management skills directly impact the project's success. (4.410/5)
- Inexperienced project managers always affect IT projects' failure; therefore, he/they should be experienced in the IT project field. Again, this result supports the **h0**, which is project manager's competence and management skills directly impact the project's success. (4.267/5)
- IT project managers must know technical details so that project to be successful. Once again, this result supports the **h0**, which is project manager's competence and management skills directly impact the project's success. (3.882/5)
- Most of the participants agree on the question "comparing to other sectors, in IT sector, project managers have a more significant role for a project to be successful". Likewise, this result supports the **h0**, which is project manager's competence and management skills directly impact the project's success. (3.379/5)
- According to the survey results, IT project managers have the most important role in an IT project, but a considerable number of participants are also hesitant about that. Still, it can be said that they should have a leading role which comes with leadership skills. (3.360/5)

When we examine the results above, we can clearly say that the project manager's competence and management skills directly impact the project's success. Therefore, h0 is accepted and h1 is rejected.

Research Question 2 (RQ2): What are the most critical factors affecting the project failures?

For the RQ2, the most critical factors affecting IT project failures can be sorted as follows. Results are sorted by their mean values.

- Unclear goals and objectives have always an effect on IT projects' failure (4.584/5).
- Poor communication between customers and project team affects IT projects' failure (4.410/5).
- Inexperienced project managers always affect IT projects' failure (4.27/5).
- Change in customers' demands affects IT project failures (4.24/5).
- Unwilling project team members mostly affects IT projects' failure (4.03/5).
- The lack of knowledge of project owners is a factor of IT projects' failure (3.67/5).
- Most of the participants agree that in IT projects, usually there is a communication problem between project owners and project integrators, but a considerable number of participants are also hesitant about that. So, it can be said that communication problems may affect IT projects' success (3.27/5).

A summary of the literature review on the reasons for IT project failures are stated below:

Fagih, Abuleil, and Khanfar provide the 10 signs of IT project failure as follows: "project managers don't understand users' needs; the project's scope is ill-defined; project changes are managed poorly; the chosen technology changes; business needs change; deadlines are unrealistic; users are resistant; sponsorship is lost; the project lacks people with appropriate skills; managers ignore best practices and lessons learned" (Fagih, Abuleil, & Khanfar, 2009, as cited in Field, 1997). Project managers' ineffectiveness to lead the project team and miscommunication with the customers and project managers do not have good training on the project's content are among the top reasons why projects fail according to Schmidt, Lyytinen, Keil, and Cule (Schmidt, Lyytinen, Keil, & Cule, 2001). Al Neimat also attributes the reasons for IT project failures to similar reasons as stated in this study. These are "poor planning, unclear goals and objectives, objectives changing during the project, unrealistic time or resource estimates, lack of executive support and user involvement, failure to communicate and act as a team, inappropriate skill" (Al Neimat, 2005). Moreover, Glaser attributes to different reasons for IT project failures. Some of these are unclear

goals and objectives in projects and changes in project objectives (Glaser, 2004) as similarly found in our survey results. Morris, however, specifies “communication amongst all members of the project” as a reason for failure in IT projects (Morris, 2020, p. 77). This is also one of the findings we have because of the answers given to the survey questions. The literature also supports the findings of the survey.

CHAPTER VI

CONCLUSION

This study aims to specify the reasons for failures in IT projects. In this study, a literature review on the topic was conducted; the general framework of projects and IT projects was examined; a survey was conducted to find out the reasons for IT projects' failures. These results were analyzed according to research questions comparing them with the literature review.

Survey results showed us that IT project managers' competence and management skills directly impact the project's success, and the most important role belongs to the IT project managers. According to these results, h0 is accepted and h1 is rejected. Suggestions to project managers in the light of the survey results are stated below.

- Focus on delivering the projects on the promised time
- Try to understand customer's demands clearly to prevent changing demands
- Specify goals and objectives of the projects clearly
- Develop your and your team's communication skills to avoid poor communication between customers and the project team
- Improve your technical and managerial skills and update your knowledge
- Remember that the most critical role and the most challenging task is yours but also remember that if your project team is unwilling, your efforts are not enough
- Choose your project team meticulously because their failure means the project's failure
- Determine milestones in the project and get confirmation from the project owner when each milestone is reached before moving to the next step
- Take on a bridge role by being in constant communication with the project owners and project integrators

- Keep the project owner and project team connected at every stage of the project
- Have enough technical dominance to manage the uninformed customer well
- There may be a lack of knowledge by the project owner, to avoid that, own the project as your own after mastering all the details.

These survey findings are generally compatible with the findings in the literature review. However, the lack of customer knowledge's effect is not one of the critical reasons for IT project failures in the literature, although it is an essential factor according to the survey results. Therefore, while the findings of this research are considered, it should be considered whether it is something specific to Turkey or not.

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APPENDIX

APPENDIX A – SURVEY QUESTIONS IN ENGLISH

1.Please provide your gender.

- Male
- Female
- Prefer not to say

2.Please provide your birth date.

3.Please provide the type of ownership of your organization.

- Private institutions
- Public institutions
- Mixed enterprises (public-private partnership)
- Foreign capital enterprises

4. Please select the position that best describes yours in the organization.

- Owner
- CEO
- Administrator/director/manager
- Project manager
- IT programmer
- IT support technician
- Software developer
- Sales executive
- Business analyst
- System architect
- IT test employee
- Other

5. Please provide the date you started to work in that position.

6. How many IT projects you have contributed to until now

- 1-5
- 6-10
- 11-15
- 16-20
- 20 or more
- None

7. Please provide the IT project content that you contributed.

- Software projects
- Hardware projects
- Both
- None

8. Have you ever been an IT Project Manager?

- Yes
- No

9. Have you ever been a Team Leader?

- Yes
- No

10. According to my experience, IT projects mostly fail.

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

11. According to my experience, IT projects are generally delivered on time.

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

12. According to my experience, IT projects generally meet customer expectations.

- Strongly agree

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

13.According to my experience, IT projects generally add value.

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

14.Please specify how much do the following reasons affect IT projects' failure.

	Never affects	Mostly doesn't affect	Doesn't have an effect	Mostly affects	Always affects
Change in customers' demands	○	○	○	○	○
Unclear goals and objectives	○	○	○	○	○
Poor communication between customers and project team	○	○	○	○	○
Inexperienced project managers	○	○	○	○	○
Unwilling project team members	○	○	○	○	○

15.IT project managers usually follow the rules of “Project Management Principles”.

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

16. IT project managers must know the technical details about the project to lead their team.

- Strongly agree

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

17.The most important role in an IT project belongs to the project manager.

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

18.A good IT project manager can finish a project successfully, no matter how bad his team is.

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

19.IT project managers usually don’t know anything about technical details.

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

20.Compared to other sectors, in the IT sector, project managers have a more significant role for a project to be successful.

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

21.Compared to other sectors, in the IT sector, project managers have a more difficult task for a project to be successful.

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

22.In IT projects, usually there is a communication problem between project owners and project integrators.

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

23.IT projects fail due to the lack of knowledge of project owners.

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

24.Please provide your comments and recommendations about other reasons for failures in unsuccessful IT projects.

Appendix B - Survey Questions in TURKISH

1.Lütfen cinsiyetinizi belirtiniz.

- Erkek
- Kadın
- Belirtmek istemiyorum

2.Lütfen doğum yılınızı belirtiniz.

3.Lütfen çalışmakta olduğunuz işletmenin tipini belirtiniz.

- Özel İşletme
- Kamu İşletmesi
- Karma İşletme (Kamu-Özel Ortaklık)
- Yabancı Sermayeli İşletme

4.Lütfen çalışmakta olduğunuz pozisyonu belirtiniz.

- Şirket Sahibi
- CEO
- Yönetici/Direktör/Müdür
- Proje Yöneticisi
- Programlamacı
- Teknik Destek
- Yazılım Geliştirici
- Satış Personeli
- İş Analisti
- Sistem Mimarı
- Test Elemanı
- Diğer

5.Lütfen bu pozisyonda çalışmaya başladığınız yılı belirtiniz.

6.Şimdiye kadar kaç tane IT projesinde görev aldınız?

- 1-5
- 6-10
- 11-15
- 16-20
- 20 ya da daha fazla

- Hiç görev almadım

7.Lütfen katkı sağladığınız IT projelerinin içeriğini belirtiniz.

- Yazılım Projeleri
- Donanım Projeleri
- İkisi de
- Hiçbiri

8.IT Proje Yöneticiliği yaptınız mı?

- Evet
- Hayır

9.Takım Liderliği yaptınız mı?

- Evet
- Hayır

10.Deneyimlerime göre, IT projeleri genelde başarısız olur.

- Kesinlikle katılıyorum
- Katılıyorum
- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

11.Deneyimlerime göre, IT projeleri genelde zamanında teslim edilir.

- Kesinlikle katılıyorum
- Katılıyorum
- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

12.Deneyimlerime göre, IT projeleri genelde müşterinin beklentisini karşılar.

- Kesinlikle katılıyorum
- Katılıyorum
- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

13.Deneyimlerime göre, IT projeleri genelde bir değer katar.

- Kesinlikle katılıyorum
- Katılıyorum
- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

14.Lütfen IT projelerinin başarısız olmasına etki eden faktörleri derecelendiriniz.

	Hiç etki etmez	Genelde etki etmez	Bir etkisi yoktur	Genelde etki eder	Her zaman etki eder
Müşterinin beklentilerinin değişmesi	○	○	○	○	○
Amaç ve hedeflerin net olarak belirtilmemesi	○	○	○	○	○
Müşteri ve proje ekibi arasındaki iletişimsizlik	○	○	○	○	○
Deneyimsiz proje yöneticileri	○	○	○	○	○
Özverisiz takım arkadaşları	○	○	○	○	○

15.IT proje yöneticileri genelde "Proje Yönetim Esasları"nı uygularlar.

- Kesinlikle katılıyorum
- Katılıyorum
- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

16.IT Proje yöneticisi, takımını yönetebilmek için, teknik detaylar hakkında bilgi sahibi olmak zorundadır.

- Kesinlikle katılıyorum
- Katılıyorum

- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

17.IT projesindeki en önemli rol proje yöneticisinindir.

- Kesinlikle katılıyorum
- Katılıyorum
- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

18.İyi bir IT proje yöneticisi, takımı ne kadar kötü olursa olsun projeyi başarıyla sonuçlandırabilir.

- Kesinlikle katılıyorum
- Katılıyorum
- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

19.IT proje yöneticileri genelde teknik detaylar hakkında bilgi sahibi değillerdir.

- Kesinlikle katılıyorum
- Katılıyorum
- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

20.Diğer sektörlerle kıyaslandığında, IT sektöründe proje yöneticisinin rolü, projenin başarısı için daha fazla önem arz etmektedir.

- Kesinlikle katılıyorum
- Katılıyorum
- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

21.Diğer sektörlerle kıyaslandığında, IT sektöründeki proje yöneticisinin çok daha zor bir görevi vardır.

- Kesinlikle katılıyorum
- Katılıyorum
- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

22.Genel olarak IT projelerinde, proje sahipleri ile proje entegratörleri arasında bir iletişimsizlik vardır.

- Kesinlikle katılıyorum
- Katılıyorum
- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

23.Proje sahiplerinin bilgi eksikliği, IT projelerinin başarısız olmasına neden olur.

- Kesinlikle katılıyorum
- Katılıyorum
- Ne katılıyorum ne katılmıyorum
- Katılmıyorum
- Kesinlikle katılmıyorum

24.Lütfen IT projelerinin başarısız olmasına etki eden diğer sebeplere dair yorum ve önerilerinizi belirtiniz.