

**UNDERSTANDING THE PERCEIVED INFLUENCE OF CRITICAL SUCCESS  
FACTORS AND PROJECT MANAGEMENT PERFORMANCE ON PERCEIVED  
OVERALL PROJECT PERFORMANCE:  
THE CASE OF TURKISH FINTECH SECTOR**



**GÖRKEM EYNÜR**

**JUNE, 2021**

**UNDERSTANDING THE PERCEIVED INFLUENCE OF CRITICAL SUCCESS  
FACTORS AND PROJECT MANAGEMENT PERFORMANCE ON PERCEIVED  
OVERALL PROJECT PERFORMANCE:  
THE CASE OF TURKISH FINTECH SECTOR**

**BY**

**GÖRKEM EYNÜR**

**DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR  
THE DEGREE OF DOCTOR OF PHILISOPHY  
IN THE DEPARTMENT OF BUSINESS ADMINISTATION**

**YEDITEPE UNIVERSITY**

**JUNE, 2021**

## **PLAGIARISM**

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Date: 28.06.2021

Name/Surname: G rkem EYN R

## ABSTRACT

Financial technologies that can offer faster transactions and more transaction diversity with lower costs, have managed to get a high share from the world economy market with the adaptation to the digital age. This situation triggered a serious increase in the number of customers and caused financial institutions to update their service quality in shorter periods.

Project management is one of the most accepted approaches to pioneer such radical changes and address interdisciplinary, complex and less predictable activities with a holistic perspective. Since this situation has increased the importance attached to the project performances by the senior management at the point of adapting corporate strategies, the issues affecting the project performances have started to be closely monitored.

With this study, it is intended to present the effects of critical success factors and project management performance to the overall project performance in Turkey financial technology sector. In addition, the moderator effect of the project duration on the relationship between project management performance and overall project performance was aimed to be determined. The study involved 284 white-collar employees who participated in financial technology projects in Turkey.

The results of the study indicate that there is a positive correlation between critical success factors and overall project performance. Similarly, a positive correlation has been found between project management performance and overall project performance. Furthermore, the results show that project duration affects the relationship between project management performance and overall project performance. According to the research, project duration negatively affects the overall project performance and the longer the project duration, the lower the overall project performance.

During the literature review, any study examining project performance specific to the financial technology sector in Turkey is not detected. Thus, this study has potential to fill this gap and provide a significant contribution to Turkish academic literature and business life.

*Keywords: Project performance, critical success factors, project management performance, project duration*

## ÖZET

Daha düşük maliyetlerle daha hızlı işlem ve daha fazla işlem çeşitliliği sunabilen finansal teknolojiler, dijital çağa uyum ile birlikte dünya ekonomi pazarından da yüksek oranda pay almayı başarmıştır. Bu durum müşteri sayılarında ciddi bir artışı tetiklemekle birlikte, finansal kurumların hizmet kalitelerini de daha kısa periyodlarla güncellemelerine neden olmuştur.

Proje yönetimi, bu tarz köklü değişimlere öncülük etme, disiplinler arası, karmaşık ve daha az öngörülebilir faaliyetleri bütüncül bir bakış açısı ile ele alma hususunda en fazla kabul gören yaklaşımlardan biridir. Bu durum kurumsal stratejilerin uyarlanması noktasında proje performanslarına üst yönetim nezdinde verilen önemi artırdığından, proje performanslarına etki eden hususlar da yakından takip edilmeye başlanmıştır.

Bu çalışma ile Türkiye finansal teknoloji sektöründe kritik başarı faktörlerinin ve proje yönetim performansının genel proje performansına etkilerinin sunulması amaçlanmıştır. Ek olarak, proje süresinin proje yönetim performansı ile genel proje performansı arasındaki ilişkiye olan moderatör etkisi tespit edilmek istenmiştir. Çalışmaya, Türkiye’de finansal teknoloji projelerinde görev alan 284 beyaz yaka çalışan katılmıştır.

Çalışmanın sonuçları kritik başarı faktörleri ile genel proje performansı arasında pozitif korelasyon olduğu yönündedir. Benzer şekilde, proje yönetim performansı ile genel proje performansı arasında da pozitif yönde korelasyon tespit edilmiştir. Ayrıca sonuçlar, proje süresinin proje yönetim performansı ile genel proje performansı arasındaki ilişkiyi etkilediğini göstermektedir. Araştırmaya göre proje süresi genel proje performansını negatif yönde etkilemekte olup, proje süresi uzadıkça genel proje performansı azalmaktadır.

Literatür taraması esnasında, Türkiye’de finansal teknolojilere özgü proje performansını inceleyen bir çalışma tespit edilememiş olup, bu çalışma ile belirtilen boşluğun doldurulabileceği ve Türkiye akademik literatürü ile iş hayatına önemli bir katkı sağlanacağı düşünülmektedir.

*Anahtar Kelimeler: Proje performansı, kritik başarı faktörleri, proje yönetim performansı, proje süresi*

## ACKNOWLEDGEMENTS

First of all, I would like to express my sincere gratitude to my supervisor Asst. Prof. Dr. Orçun TÜREGÜN for his encouragement, guidance and valuable contributions to my dissertation that would not have been possible without his backing.

Secondly, I am also greatly thankful to Prof. Dr. Özlem KUNDAY and Assoc. Prof. Dr. Alper ALTINANAHTAR for their valuable feedback and assistance as the members of thesis committee.

Next, I want to express my special thanks to Barış DALAN who has never withheld his moral support and encouragement throughout all my university life, and also led me to mature personally and professionally as well.

Also, the academic content of this dissertation would never have found a chance to be applied and analyzed widely in financial technology sector without direct and indirect contributions of my colleagues. I am grateful for having the privilege to work with them.

Finally and most importantly, I would also like to extend my thanks to my father Halil EYNÜR, my mother Beyhan EYNÜR and my grandmother Fatma ALGAN for being with me all the time despite all the difficulties. I am glad to feel their faith in me while making vital and irreversible decisions throughout of my life. My work would be totally meaningless without their lifelong support, patience and encouragement.

Görkem EYNÜR

## TABLE OF CONTENTS

|                                                                                     |      |
|-------------------------------------------------------------------------------------|------|
| PLAGIARISM .....                                                                    | i    |
| ABSTRACT.....                                                                       | ii   |
| ÖZET .....                                                                          | iii  |
| ACKNOWLEDGEMENTS.....                                                               | iv   |
| TABLE OF CONTENTS.....                                                              | v    |
| LIST OF FIGURES .....                                                               | vii  |
| LIST OF TABLES .....                                                                | viii |
| 1. INTRODUCTION .....                                                               | 1    |
| 2. LITERATURE REVIEW .....                                                          | 3    |
| 2.1. The History of Project Management .....                                        | 3    |
| 2.2. Definition of Project and Project Management.....                              | 4    |
| 2.3. Project Performance and Success Perception .....                               | 6    |
| 2.4. Critical Success Factors (CSFs) .....                                          | 8    |
| 2.5. Project Management Performance (PMP) .....                                     | 13   |
| 2.6. Critical Success Factors and Its Relationship with Project Performance .....   | 15   |
| 2.7. Project Management Performance and Its Relationship with Project Performance . | 18   |
| 2.8. Project Duration and Its Relationship with Project Performance .....           | 22   |
| 3. RESEARCH MODEL AND HYPOTHESIS .....                                              | 27   |
| 3.1. Research Model.....                                                            | 27   |
| 3.2. Hypothesis.....                                                                | 28   |
| 4. RESEARCH DESIGN AND METHODOLOGY .....                                            | 29   |
| 4.1. Research Design.....                                                           | 29   |
| 4.2. Research Methodology.....                                                      | 29   |
| 4.2.1. Data Collection and Analysis .....                                           | 29   |
| 4.2.2. Measurement .....                                                            | 30   |
| 5. PILOT STUDY AND RESEARCH FINDINGS.....                                           | 31   |
| 5.1. Descriptive Statistics of the Pilot Study.....                                 | 32   |
| 5.2. Reliability Analysis of the Pilot Study.....                                   | 33   |
| 5.3. Factor Analysis of the Pilot Study .....                                       | 34   |

|                                                     |     |
|-----------------------------------------------------|-----|
| 6. RESEARCH FINDINGS OF THE MAIN STUDY .....        | 39  |
| 6.1. Descriptive Statistics of the Main Study ..... | 39  |
| 6.2. Reliability Analysis of the Main Study .....   | 42  |
| 6.3. Factor Analysis of the Main Study .....        | 43  |
| 6.4. Measurement Validity .....                     | 47  |
| 6.5. Hypothesis Testing .....                       | 48  |
| 6.5.1. Hypothesis 1 .....                           | 50  |
| 6.5.2. Hypothesis 2 .....                           | 52  |
| 6.5.3. Hypothesis 3 .....                           | 55  |
| 6.5.4. Summary of the Hypothesis Testing .....      | 58  |
| 6.6. Additional Work .....                          | 58  |
| 6.6.1. Total Tenure Difference Analysis .....       | 59  |
| 6.6.1.1 Total Tenure More Than 10 Years .....       | 59  |
| 6.6.1.2 Total Tenure Less Than 10 Years .....       | 65  |
| 6.6.2. Gender Difference Analysis .....             | 70  |
| 6.6.2.1 Female Participants .....                   | 70  |
| 6.6.2.2 Male Participants .....                     | 76  |
| 6.6.3. Summary of Additional Work .....             | 82  |
| 7. CONCLUSION & DISCUSSION .....                    | 83  |
| 7.1. Discussion .....                               | 83  |
| 7.2. Implications for Management .....              | 87  |
| 7.3. Limitations of the Study .....                 | 92  |
| 7.4. Suggestions for Future Research .....          | 93  |
| 8. REFERENCES .....                                 | 94  |
| 9. APPENDICES .....                                 | 100 |
| Appendix A. Survey in English .....                 | 100 |
| Appendix B. Survey in Turkish .....                 | 109 |

**LIST OF FIGURES**

|                                                            |    |
|------------------------------------------------------------|----|
| Figure 1 Project Duration and Team Size Relationship ..... | 24 |
| Figure 2 Proposed Research Model .....                     | 27 |



## LIST OF TABLES

|                                                                                        |    |
|----------------------------------------------------------------------------------------|----|
| Table 1 CSF Importance Rankings in Project Implementation Profile (Hyvari, 2006) ..... | 13 |
| Table 2 Measuring Success across Time (Ika, 2009) .....                                | 17 |
| Table 3 Descriptive Statistics of the Pilot Study (n=50) .....                         | 32 |
| Table 4 Reliability Results of the Measurement Instruments in the Pilot Study .....    | 34 |
| Table 5 Factor Analysis of CSFs in the Pilot Study .....                               | 36 |
| Table 6 Factor Analysis of PMP in the Pilot Study .....                                | 37 |
| Table 7 Factor Analysis of Overall PP in the Pilot Study .....                         | 38 |
| Table 8 Descriptive Statistics of the Main Study (n=284).....                          | 40 |
| Table 9 Distrubition of the Companies that Respondents Work With .....                 | 42 |
| Table 10 Reliability Results of the Measurement Instruments in the Main Study .....    | 43 |
| Table 11 Factor Analysis of CSFs in the Main Study .....                               | 44 |
| Table 12 Factor Analysis of PMP in the Main Study .....                                | 46 |
| Table 13 Factor Analysis of Overall PP in the Main Study.....                          | 47 |
| Table 14 Correlation Analysis between Variables .....                                  | 49 |
| Table 15 Summary of the Hypothesis Testing.....                                        | 58 |
| Table 16 Summary of the Additional Work .....                                          | 82 |

## 1. INTRODUCTION

Financial technology sector which has started to change in shorter periods, to be more dynamic and complex compared to previous years, is increasingly dominating all aspects of business life. The increasing importance of the sector is combined with major concerns of today's organizations including more and faster decision making, bringing new projects on stream and into the market.

In order to handle these kind of novel or complex activities together with unique and unfamiliar undertakings, project management is an efficient tool compared to other traditional methods of management (Munns & Bjeirmi, 1996).

The subject of project success or higher performance, is at the heart of project management, has interested academics and practitioners for decades and continues to be a vibrant school of thought today. In terms of project context, our understanding of success, continues to have different meanings for different stakeholders, has evolved over the years (Müller & Jugdev, 2012).

Critical success factors are used as independent variables to predict project success and increase the likelihood of project performance when influenced (Müller & Jugdev, 2012). They are the limited number of multidimensional concepts in which constant and careful attention should be paid in order to take satisfactory performance results and flourish business (Fortune & White, 2006).

One construct on project performance that has paid remarkable attention is project management performance, which is concerned with on-time delivery, within-budget and appropriate performance of project (Munns & Bjeirmi, 1996). Consequently, the success of project management has often been associated with the final outcome of the project.

Since both of them are heavily orientated towards to the achievement of the project, these two may appear to overlap. Confusion have arisen between the two in practice based on three factors including inseperable time frame, intertwined objectives and ease of measurement by means of readily identifiable measures (Munns & Bjeirmi, 1996). Even though there have been too many factors outside the direct control of the project managers, they are the key pins to all activities as well as relationships and contributes significantly to the success or failure of projects.

Based on all of these, this research aimed to focus on examining the relationship of both critical success factors and project management performance with overall project performance among financial technology professionals, as well as paying particular attention to the moderating role of project duration between these factors.

The financial technology sector, unsettling every corner of global finance, rapidly displacing old-fashioned financial products, rendering it possible to lower costs and greater access for all. The dramatic upheaval compels organizations to react in a very short time to instant changes, keep pace with competitive project-oriented world and devise disruptive innovations which could be achieved via successful implementation of numerous projects. In order to capture market in a profitable manner, companies focus more on sustainable and successful accomplishment of projects.

Following the way highlighted in these objectives, this paper reviews the existing literature of main constructs to reveal what other scholars have examined and which relationships they have uncovered.

The paper proceeds further with investigating the relationship between suggested variables as well as the moderating role of project duration and proposes hypotheses among them. The research model and research methodology are then suggested and concluded with data collection, analysis and measurement for future research.

## 2. LITERATURE REVIEW

### 2.1. The History of Project Management

The roots of fundamental project management starts with large-scale construction needs of mankind. Project management was used for organizing tasks, coordinating different groups of people having various skill sets and maintaining relationships towards a common goal. Evidence for project management methodology usage could be seen in Egyptian pyramids, Roman aqueducts, Great Wall of China, Taj Mahal and other great artifacts (Shenhar & Dvir, 2007; Frame, 2003).

Together with the introduction of scientific management by Frederick Taylor, project management started to be accepted as a recognized discipline in the 20<sup>th</sup> century. Gantt chart, which is a graphical technique used for planning and scheduling, was developed by Henry Gantt for U.S. Navy ships during World War I (Murch, 2001). The Program Evaluation Review Technique (PERT), which is a method for determining minimum time requirement to finish total project by means of dividing it into smaller tasks together with their durations, was developed to manage aerospace projects in 1950s and 1960s (Uluocak, 2014). The Critical Path Method (CPM) was an another technique developed for planning of U.S. Navy, calculates the longest path of activities together with their earliest/latest time where each activity can start and finish (Uluocak, 2014).

As a result of successive developments in technology, size and complexity of projects began to increase and made it a necessity to formalize project management processes for companies (Kerzner, 2010). Based on these kind of organizational changes, researchers developed theories, established standards and published papers related to project-based organizations in the early 1980s (Alfi, 2002). By the 1990s, organizations realized that implementing formal project management was not a choice, but a necessity (Uluocak, 2014). Based on the technological, economic and social driving forces, hierarchical, highly centralized top down structures are forced to evolve towards decentralized project based organizational structures (Alfi, 2002).

And today, projects are used as a tool to turn corporate/business/functional strategies into reality (Crawford & Pennypacker 2002). Since strategic plans are composed of large and small projects, every single project is a vehicle to deploy critical plans aiming to save or make money as a final purpose (Heerkens, 2002).

## 2.2. Definition of Project and Project Management

The roots of the project term comes from the Latin word *projectum*, which is the past principle of *proicere*, having a meaning to throw forward. The original word means something that comes before anything else is done (Uluocak, 2014).

Project is defined as “*a temporary endeavor undertaken to create a unique product, service or result*” in Project Management Institutes’s Project Management Body of Knowledge (PMBOK). International Project Management Association (IPMA) defines project as “*time and cost constrained operation to realize a set of defined deliverables up to quality standards and requirements*”. As can be understood from widely accepted definitions, a project can be defined with the following characteristics (Pinto & Slevin, 1988):

- Specified time to completion: A defined beginning together with a defined end
- A series of interrelated or complex activities
- Performance expectations: Specific set of goals
- A certain budget

More specifically, an information technology project could be defined as a temporary effort undertaken to reveal unique and value added results. These outputs might be achieved in the form of a product or service including web site design, mobile application development, test automation, enhancement of infrastructure and migration of a database (Varajao et al., 2018). Because many sectors today focus on rapid access and proper use of information, organizations have been trying to grow their awareness of how to address and trade on from technology.

From another point of view, agile project management, whose roots could be found in software development, is accepted as an organizational change. It is an iterative, fast, flexible and effective type of project management desgined to attain significant value quickly and continuously add on throughout the project (Rasnacis & Berzisa, 2016). While in traditional waterfall projects, the predetermined plan is followed and minimal changes are made, agile projects embrace inevitable changes and adapt them successfully. Agile project management mainly focus on two areas including the adoption to substantial change during implementation and augmented collaboration between employees (Pareliya, 2019; Garoushi et al, 2018).

Information systems projects, no matter of their type, paving the way for higher technology use and digitalization, become the key to success in such sectors. The transition from routine operations which are based on current knowledge base and clear definitions of future goals to unstable, flexible and innovation-oriented ones require the development new knowledge creation and sharing (Davies & Brady, 2016). Information systems projects associated with these practices, thus, need to be goal oriented and staged.

Overcoming the difficulties of building a new road and moving forward requires not only vertical specialization in technic but also t-shaped skills for wider analyses. Based on the interdependent and thus complicated nature of information systems projects, activities performed through the project life cycle are not free of failure. According to a report released by PMI in 2017, it is stated that 19% of all projects fail and nearly half of them have shown scope creep or budget exceeding (Sanchez et al., 2017).

According to the research conducted by Deloitte in 2017, financial service industry or in other words fintech sector is accountable for 13% of the total investments made in information technology area all over the world. Based on the awareness and development level of each country, this ratio shows variation in parallel. For instance, in Brazil, Central Bank enforces fintech industry to adopt specific project management practices in order to minimize and mitigate possible risks as well as maximizing nenefits of information technology projects (Terlizzi et al., 2017).

On the other hand, project management is defined as a combination of planning, organizing, directing, and controlling organizational resources in order to complete relatively short term objectives (Kerzner, 2006). Job description is not only related to planning, monitoring and control aspects of project, but also comprises activate motivation of all members to achieve common goals on safe manner (Radujkovic & Sjekavica, 2017).

PMBOK makes the definition of project management as “*the application of knowledge, skills, tools and techniques to project activities to meet the project requirements*”. It can be clearly seen from the definition that, project management is heavily concentrated on project performance regarding time, cost and quality criteria. These short-term dimensions composing the “iron triangle” was accepted as the very first model of project management success, which later proven to be only a crucial part of overall project performance (De Wit, 1988).

Project manager is not accountable only for time, cost and quality management, but also stakeholder, communication, scope, resource, risk and vendor management. Taking the wider area of responsibility into consideration, it could be conveniently stated that project manager is the most liable person for overall project performance (Radujkovic & Sjekavica, 2017).

Project management is one of the crucial strategies in today's world in order to adapt from a stable environment into a more dynamic and turbulent one. The continuously changing open environment of business widens the range of activities need to be completed by project management. Project management needs to be much more adaptive than ever in order to respond changing characteristics.

### **2.3. Project Performance and Success Perception**

Based on the differentiation in complexity, uniqueness and size of projects; it is not possible to specify and agree upon a universal set of criteria for measuring success, thus the success criteria alters from project to project (Westerveld, 2003; Müller and Turner, 2007). Even for a particular project, performance and success perception varies among individuals and stakeholders (Cleland and Ireland, 2006). In other words, a project which is accepted as a successful project by an individual or group, may be considered as an unfruitful one for others. Since there is not a standard or general agreement on both the definition and measurement of project success, wide variety of studies were conducted on the related topic (Culler, 2009).

According to the literature, performance and success perception is a networked and multi-dimensional construct evolving over time (Garoushi et al, 2018; Joslin & Müller, 2016; Müller and Jugdev, 2012). Müller and Jugdev's study states that success perception and the relative importance of success dimensions differ by personality, nationality and project type. As an inevitable consequence of high differentiation, various frameworks are developed to measure project performance and success over time. Murphy, Baker and Fisher (1974) state that, it is pointless to deal with complete success in project management, since, there is only the perceived success of projects and evaluation criteria changes over time. Pinto and Mantel (1990) proposed to measure the following three dimensions; the success in the implementation process, the perceived value of the project and client satisfaction with

the results. Lipovetsky et al. (1997) recommended measuring across four dimensions; design and planning target coverage, customer and organizational benefits and advantages for the national infrastructure. Whereas, Atkinson (1999) divided project success into three different parts: completing the process right, getting the system right and capturing right advantages.

Radujkovic and Sjekavica (2017) states that projects can culminate with success even though unsuccessful project management and vice versa. It might be formed based on achieving long term or wider set of outcomes, no matter short-term orientation.

Project success is grouped with the use of macro and micro criteria. It is also proposed that, it is not quite possible for all project stakeholders to have the same point of view on project success. Particularly in fintech sector, a project which is deployed on time and budget might be accepted as a success at first. On the other hand, the perception about the project might start to change and result in as a failure after experiencing any quality problems over time (Uluocak, 2014). Furthermore, Baccarni (1999) advocated that project success and failure are not a black and white issue and they are not necessarily contradictory or opposite terms.

Shenhar et al. (2001) stated a four dimensional comprehensive framework for measuring project success that is cited in too many project management studies (Bryde, 2008; Dvir et al., 2006; Jugdev and Müller, 2005). They advocated that all projects are strategically important and based on this viewpoint, project failure and success should be assessed according to both short and long term targets. Their four dimensional model includes concepts such as efficiency (meeting time and cost objectives), impact on customers (meeting customer needs in terms of performance), business success (gaining commercial value and higher market share) and preparation for the future (creating new technologic or market opportunities) (Mir & Pinnington, 2014). All of these dimensions are dependent on time and the technological uncertainty. Furthermore, too many studies stated that teamwork effectiveness should also be considered as a component of project success (El-Saboni et al., 2009; Bryde, 2008).

Critical success factors are the inputs to project management practice which can directly or indirectly influence and contribute to project performance and results (Fortune & White, 2006). Early studies related to critical success factors were focused on the reasons of project failure instead of project success. Lack of support from top management, wrong

choice of the project manager, improper planning and limited communication are the fundamental reasons for project failure (Uluocak, 2014).

Since understanding failure does not guarantee future success, critical success factors had started to focus on improving project performance and results. And consequently, the subject of project success drew attention and took its place at the heart of project management. The literature refers to two components of project success (Müller & Jugdev, 2012; Turner, 1999):

- Project success factors, which are independent variables that make success more likely, are the elements of a project which influences the likelihood of success.
- Project success criteria, which are dependent variables that measure success, are the measures used to judge on the success or failure of a project.

The interest in project success was evident in the streams of project management research that identify widely accepted perspectives or schools. In 1995, the field was became prominent with two streams of research – one was the optimization school and the other one was critical success factors (Packendorf, 1995). While optimisation school is dealing with work breakdown structures and network planning techniques for integrating tasks, CSF school examines generic factors related to project success. CSF school was still one of the dominant schools of thought in the field even though the number of schools was expanded to seven schools in 2002 and nine schools in 2010 (Turner et al., 2010).

#### **2.4. Critical Success Factors (CSFs)**

Majority of the CSF school focused on the traditional iron triangle which are cost, quality and schedule for measuring project success (Walker & Shen, 2002). Prior to renowned articles by Pinto, Slevin and Prescott in the late 1980s, different studies have addressed different critical success factors, project success was defined diffusely and a lack of consensus on the criteria for judging project success emerged (Fortune & White, 2006). Since the researchers captured the diversity in how success is defined and measured, critical success factors were varied according to project life cycle phases, project types, industries, nationalities and organizations (Müller & Jugdev, 2012).

Even though Pinto, Slevin and Prescott were not the first to address the issue of success factors, they were pioneers of addressing success as a multidimensional concept instead of using a single measure (Müller & Jugdev, 2012). They defined project success at the outset, took a broad and systematic approach and weighed different factors throughout the project life cycle. They also created a tool to assess the status of their projects and compare them with a database including more than 400 projects. They contributed to the field through a holistic approach and further extended our critical success factor understanding by project stage, planning categories and project manager's influence.

Even though there have been valuable contributions to project success and critical success factors, it is understood that it is impossible to generate a single complete list that will suit all types of projects (Joslin & Müller, 2016; Uluocak, 2014). This is because the fact that success definition and factors differ greatly from one project to another due to variables including scope and complexity (Wateridge, 1998).

In addition to the lack of agreement described above, two different criticisms related to critical success factor approach emerged from the literature (Müller & Jugdev, 2012). First one states that factor inter-relationships are as important as each and every factor but the factor approach does not provide a mechanism for measuring it. The second one asserts that factor approach accepts project implementation as a static process ignoring both the dynamic nature of process and the potential for a factor to have varying levels for different stages.

Even though different researchers have proposed multifarious factor lists and frameworks, Pinto, Slevin and Prescott laid the foundation and advanced our evolving understanding of project success (Müller & Jugdev, 2012). Based on their multi-dimensional and networked construct, Project Implementation Profile (PIP), which was proposed by Slevin and Pinto, is used to identify and measure critical success factors in this study. It includes ten key success factors as project mission, project team, client acceptance, communications, client consultation, monitoring and feedback, troubleshooting, top management support, technical tasks and project schedules/plan.

Pinto and Slevin (1987) categorized these success factors as strategic or tactical. For instance, strategic ones include project mission, top management support and like, whereas tactical factors consist of project team and client consultation. The detailed information related to the ten critical success factors in Project Implementation Profile is given below:

1. **Project Mission:** Project mission, which relates to the main purpose of the project, consist of setting up clear definition of not only goals and directions but also outputs derived from the project and declaring to all project stakeholders. PMI states that project charter is applied in project scope statement in order to describe product or service characteristics. Project scope statement elaborates overall project objectives and the extent of functionality. The project mission also includes conducting a feasibility study in which goals of the project is correspondent with organizational ones (Pinto & Slevin, 1987).

2. **Top Management Support:** Management support includes aspects regarding allocation of resources (personnel, budget, time, etc.) and in case of any risk, authorizing power to provide more resources for the project. Project teams through project managers will receive support and guidance with respect to the authority. Moreover, management support means giving project managers the assurance that they will continue to be promoted in case of a crisis. According to PMI, this success factor is supported and also shared as a best practice in the PMBOK.

3. **Project Schedule/Plan:** Project schedule/plan is associated with the development of detailed task requirements and phase categorization that is necessary for the implementation of a project. It is important to bear in mind that necessary tasks related to project planning is different from project schedule or timesheet (Rankovic et al., 2019). Planning, as the first step in the development of a project implementation, includes scope and goal determination, creation of work breakdown structure, allocation of resources and activity assignment. Scheduling, on the other hand, refers to designing a timetable in which deadlines for each activity of the project is given. According to PMI, plan and schedule together forms a hierarchy of required tasks to achieve deliverables of the project. Sum of these deliverables forms the product or service delivery which presents benefit to stakeholders (Uluocak, 2014).

4. **Client Consultation:** Client consultation, in which client is referred to as anyone who will use the product either inside from or outside the company, consists of involving clients in the implementation process, giving ear to all stakeholders and ensuring continuous communcaition with them (Slevin & Pinto, 1986). The term is highly related to the project activities ensuring quality of a product. Therefore, it is accepted that client support is directly related to the level to which clients are involved in the project. According to PMI, it is important to take continuous feedback from clients throughout the project life cycles,

controlling whether their needs have been met or not in order to increase product usage and acceptance.

5. **Project Team:** Project team implies selecting, recruiting and training of team members who will participate in the same project. It is one of the most significant but often overlooked aspect of project implementation, concerning the nature of the human resources (Rankovic et al., 2019). According to PMI, human resource planning refers to preparing a staffing plan and filling the positions with a full insight into the skills needed for an active contribution.

6. **Technical Tasks:** Technical tasks refers to not only having the available technology support and procedures to perform technical objectives but also talented and competent number of human resources for the implementation. From this point of view, it is critical that project managers should have the comprehensive knowledge of appropriate technology that will be used in the project. Projects could be disintegrated and transformed into a series of technical mistakes in the absence of necessary technology and technical skills (Rankovic et al., 2019). According to PMI, planning activities should be noted together with the technology and resources applied.

7. **Client Acceptance:** Client acceptance, which is the ultimate step in the project implementation, is different from client consultation and generally deals with general efficiency of the project. It is important to attain approval together with product or service acceptance from the client who have given consultation throughout the earlier phases of the project (Slevin & Pinto, 1986). Project managers are frequently mistaken that the client will accept the project if other phases of the implementation are performed well. On the contrary, client acceptance should be managed studiously from the beginning to the end of the project. According to PMI, the sense of project ownership and acceptance at the end of the process fortifies the perceived project success (Uluocak, 2014).

8. **Monitoring and Feedback:** Monitoring and feedback, which is related to the project control process at the end of each single phase, helps to provide detailed information to the stakeholders. It is also beneficial to make a comparison between what is planned in initial predictions and what is actually happened. Supervision mechanisms enable project managers to predict problems, give feedback to employees, and even escalate to take precautions to ensure success (Rankovic et al., 2019). According to PMI, it is quite important in terms of process improvement evaluations and risk identification.

9. **Communication:** Communication is not only important for project team members themselves, but also crucial to ensure a connection with stakeholders and the rest of the organization as well as clients. It is associated with the establishment of essential information and communication channels through which team members, stakeholders, clients and other related teams correspond. From another point of view, it provides the necessary infrastructure for the feedback mechanism and exchange of information (Rankovic et al., 2019).

10. **Troubleshooting:** Troubleshooting, in other words problem solving, implies that problems might occur in every project no matter how carefully the planning is done. Project success is not measured via problem avoidance, rather it is measured by the appropriate amendments carried out once a problem has occurred. Therefore, project managers ought to have mechanisms to recognize problems earlier, prevent issues from growing further and negotiate with team members to make necessary arrangements (Slevin & Pinto, 1986). According to PMBOK, monitor and control category consists of processes to recognize potential issues and trigger corrective actions.

The importance attached to the critical success factors stated in the Project Implementation Profile varies among studies. Table 1 presents the importance rankings for each factor in which 1 represents the most and 10 represents the least significant factor.

Table 1 CSF Importance Rankings in Project Implementation Profile (Hyvari, 2006)

|                                    | <b>Hyvari<br/>(2006)</b> | <b>Finch<br/>(2003)</b> | <b>Dehisle &amp;<br/>Thomas<br/>(2002)</b> | <b>Pinto &amp;<br/>Presscott<br/>(1988)</b> | <b>Pinto &amp;<br/>Slevin<br/>(1987)</b> |
|------------------------------------|--------------------------|-------------------------|--------------------------------------------|---------------------------------------------|------------------------------------------|
| <b>Project Mission</b>             | 6                        | 7                       | 1                                          | 1                                           | 1                                        |
| <b>Top Management<br/>Support</b>  | 4                        | 6                       | 9                                          | 7                                           | 2                                        |
| <b>Project Schedule/Plan</b>       | 5                        | 5                       | 5                                          | 9                                           | 9                                        |
| <b>Client Consultation</b>         | 2                        | 1                       | 2                                          | 2                                           | 4                                        |
| <b>Project Team</b>                | 9                        | 10                      | 10                                         | 10                                          | 5                                        |
| <b>Technical Tasks</b>             | 7                        | 9                       | 4                                          | 3                                           | 6                                        |
| <b>Client Acceptance</b>           | 3                        | 4                       | 6                                          | 4                                           | 7                                        |
| <b>Monitoring and<br/>Feedback</b> | 10                       | 3                       | 3                                          | 5                                           | 8                                        |
| <b>Communication</b>               | 1                        | 2                       | 8                                          | 6                                           | 9                                        |
| <b>Troubleshooting</b>             | 7                        | 8                       | 7                                          | 8                                           | 10                                       |

## 2.5. Project Management Performance (PMP)

The strategic goal of a project is generally confused with objectives of project management, which actually includes control of time, cost and progress (Munns & Bjeirmi, 1996). It is possible to both come up with a successful project even project management is failed and vice versa. Since both of the terms are heavily orientated towards project success, it is necessary to develop distinct definitions for the terms. Project can be considered as the achievement of a set of particular objectives involving a series of activities, each having pre-defined start and end dates together with cost constraints. On the other hand, project management can be considered as the process of monitoring and controlling the achievement of project objectives by applying a collection of tools and techniques.

Project management plays a crucial role in overall project performance but their role is affected by many other factors that are not under direct control of the project manager (Gewanlal & Bekker, 2015; Munns & Bjeirmi, 1996). Tools and techniques used within project management will contribute to the achievement of projects, but project management itself will not stop a project from failing (Müller & Turner, 2007). If the project itself is right, it will succeed almost without the success of project management. If the right project is combined with successful project management, the success ratio is further increased (Gewanlal & Bekker, 2015).

As stated in the definitions above, project management deals with more specific, short term and narrow subset of objectives for success. In contrast, a project deals with long term and larger set of objectives for success. These comparisons would indicate that project management is purely a subset of the wider context of project as a whole (Morris & Hugh, 1986).

Based on the overlap that exists between a project and project management, the confusion could have arisen because of three factors (Munns & Bjeirmi, 1996):

1. **Time Frame:** Since the schedule, budget and quality criteria can be measured at the end of project management phase, it is convenient to compare original data to what is achieved and judge success. But in reality, long term indicators of the project would not be realized yet and would not be able to measure at that point. Based on this problem, project management success is accepted as the project success and the two are inseparable.
2. **Confusion of Objectives:** Based on the lack of distinction between two sets of objectives which seems correlated, the terms are often intertwined.
3. **Ease of Measurement:** Two of the objectives within project management, cost and time, are easy to measure and makes it convenient to use their results of project management success as a means of stating overall project performance.

Traditional approaches which is pursuing cost, time and quality requirements are considered to be ineffective in today's world (Mir & Pinnington, 2014). Since expectations of project stakeholders are changing continuously and often difficult to manage, the number of models developed for measuring project management success is limited (Chan et al., 2003). It is evident in the literature that project management and total quality management

are the two key management approaches for managing organizational change, systematic planning and achieving strategic objectives (Bryde, 1997; Kerzner, 2003).

Project management success could be evaluated via already mentioned criteria of time, cost, quality and scope. But more modern models of measuring success such as PMPA (Project Management Performance Assessment) and mature models like Project Excellence Model could also be applied. Since project management creates both tangible and intangible advantages, it is hard to come up with a precise evaluation of project management success (Radujkovic & Sjekavica, 2017).

Based on the findings, project management is measured via well-known total quality management models. EFQM model, which is based on the total quality management philosophy, is an effective performance assessment model (Neely et al., 2007). Similarly, PMPA (Project Management Performance Assessment) model, which is based on the EFQM model, is proposed for measuring project management performance (Bryde, 2003). The PMPA model uses five enablers and a key performance indicator to measure the actual achievement (Mir & Pinnington, 2014). Even though EFQM is a tested model, there is not any statistical background presented. On the other hand, PMPA model, which is comprehensive enough to cover all aspects in terms of project management context, is a tried and validated model (Din et al., 2011). Because of statistical background and validated context, PMPA model is used to identify and measure project management performance in this study.

## **2.6. Critical Success Factors and Its Relationship with Project Performance**

Strategy management and project management are issues of high relevance in organizational environment, even though they are generally addressed in isolation by companies. One of the most significant ways in which project and strategy management interacting is through project management maturity. In this sense, in order to attain maturity in project management, it is necessary to decide on a series of actions complementing each other, characterized as critical success factors. Success in terms of project management in organizations relies on a number of factors including organization type, type of and importance for projects, availability and competence of resources, the environment during the realization of projects and the like (Junior and Luciano, 2010). Therefore, attaining

project success is of utmost importance and dominates most of the organizational investment.

In terms of fintech sector which is highly dependent on technology, organizations are in a hurry to collect vast amounts of data, associate them each other to create value, ensure compliance with government regulation and launch differentiating products or services in shorter periods. The stage where significant and relevant information is extracted from lots of data sources, analysed in a planned manner and then transformed into structured actions is the key to gain competitive advantage (Bumblauskas et al., 2017). In order to avoid losing this opportunity to opponents, organizations should use project management as a powerful tool in implementation, ensuring critical success factors (Ferreira et al., 2019).

Research related to success factors represents a significant stream in project management literature. Six decades of research have extended the number of success criteria, brought forward a variety of new success factors and changed the perception and understanding (Fossum et al., 2020). A broad review of the success factors are found in the literature and presented with several limitations. In the same vein, Ika (2009) states that project success and what is inferred from it changed through time together with critical success factors. The trends throughout the years together with their research-focus are shown in Table 2.

Table 2 Measuring Success across Time (Ika, 2009)

| <b>Research Focus</b>   | <b>Period-1<br/>(1960s-1980s)</b>       | <b>Period-2<br/>(1980s-2000s)</b>                                                                                                                              | <b>Period-3<br/>(2000+)</b>                                                                                                                                                    |
|-------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Success Criteria</b> | -Iron triangle<br>(time, cost, quality) | -Iron triangle<br>-Benefits to organization<br>-Client satisfaction<br>-Benefits to project personnel<br>-Benefits to stakeholders<br>-End-user's satisfaction | -Iron triangle<br>-End-user's satisfaction<br>-Benefits to stakeholders<br>-Benefits to project personnel<br>-Strategic objective of client organizations and business success |
| <b>Success Factors</b>  | -Explanatory lists                      | -Critical success factor lists and frameworks                                                                                                                  | -More inclusive critical success factors frameworks and symbolic success factors                                                                                               |
| <b>Attention</b>        | -Project management success             | -Project/product success                                                                                                                                       | -Portfolio, program and project/product, success and narratives of success and failure                                                                                         |

According to the framework, the first phase (1960s-1980s) is highly dominated by the iron triangle which means project management success is accepted as the main criteria of overall project success. The second phase (1980s-2000s) is concentrated on other critical success factors which were also pointed out in the research of Pinto and Slevin. Throughout the second phase, although the iron triangle remained quite significant, another success criteria were welcomed and the value judgement started to move from project management success to project success. And finally, the third phase (2000+) appreciates strategic decision making, portfolio and program management in addition to the already existing project criteria (Uluocak, 2014).

Baccarini (1999) states that hard dimensions of a project including time and cost are measurable, objective and tangible. However, Atkinson (1999) asserts that quality which

continues to be evaluated also after project delivery lead up to a wider perspective in success analysis. Measuring success after delivery allows the whole project team to empathise with customers, to test customer expectation fulfillment, observe project benefits through stakeholder perspective (Tam et al., 2020; Badewi, 2016; Jugdev & Müller, 2005). With this emphasis on measuring success, it is reasonable to expect that today project success rely on anyone involved in project. In parallel with this view, today's essential criteria like customer satisfaction and stakeholder benefits are difficult to measure, subjective and intangible.

Shenhar et al. (2005) advocates that project success is highly dependent on the type of project. If the project is an operational one, the focus will be the traditional triangle view of project success. However, if the project is a strategically managed one, then the target will be shifted to the business results.

The Standish Group, an international information technology research company, has concentrated on factors of greatest impact on projects and published detailed reports dealing with project success and failure. Their 2013 publiccation revealed that only 39% of all information technology projects concluded successfully (Tam et al., 2020; Uluocak, 2014).

Today, still a vast majority of the researchers place more emphasis on the iron triangle, despite they accept that there are many other criteria for project success. The literature presents distinct postulates regarding the effect of success factors on overall project performance. It is understood more clearly in the last decades that more comprehensive definitions are necessary for project success (Badewi, 2016; Jugdev & Müller, 2005).

Since acquiring project success depends on various dimensions and interpretations, one consensus exists in the literature that no single best method of measurement exists (Thomas & Fernandez, 2008). It is unfeasible to develop a unique complete list of factors that can cover all projects. Furthermore, there is limited research examining the relationship between success factors and project success.

## **2.7. Project Management Performance and Its Relationship with Project Performance**

Informed by previous literature, when we talk about project success concept, there are chiefly two main success concepts including project success itself and project management success. Professionals and scholars try to articulate the exact meaning of these

terms in order to come up with a clear project success definition. However, making a clear distinction between them is a challenging task due to the mutual nature of these terms (Abylova and Salykova, 2019).

Abylova and Salykova (2019) state that the perception of success changed significantly over the years. They put forward highly increasing number of project types and expanding penetration of project management into various industries as a proof for this change.

Sumner (1999) recommended that most of the best practices of project management require use of both internal and external integration strategies. Internal integration strategies cover the selection of a veteran project manager, giving priority to the selection of team members having previous work relationships and outsourcing technical expertise. On the other hand, external integration strategies include customer participation into the project team and creation of a user steering committee. In addition to these strategies; effective project planning, proactive change management, compatibility of analytic and technical skills and prominent leadership who have the ability of marketing project internally (Beath, 1991).

From another point of view, Sumner (1999) emphasized the critical significance of integration in enterprise-wide projects. If you start with small pieces and then try to integrate other components later on, you will have to come up with trying to modify the available components with existing processes. The project will become more complex due to the increasing number of requirements in course of time and this will trigger not only time and cost overruns but also customer dissatisfaction and most probably result in project failure. In order to prevent these type of integration problems conducive to project failure, project managers need to use wiser and extensive planning. They should start with small and empowered teams having both business sense and technical knowledge. They ought to use standardization to create flexibility, eliminate complexity and address tough issues squarely. Moreover, they should bring all relevant projects together and manage them. If any of the projects are behind the schedule, they should be ware that adding new team members will worsen the situation (Sumner, 1999).

Together with the development and dispersion of information technology, people are increasingly realising the importance of the execution of project management. Even though at first, they put excessive emphasis on technology research and neglect the pivotal role of

project management, they start to realize the importance subsequently based on the complicated and non-linear nature of information technology projects which often experience multitudinous problems (Fan, 2010). It means project managers need to deal with and overcome numerous issues including business-side (great and quick changes in demand), technological (incremental and disruptive innovations in the market) and humanistic (frequent movement and high turnover ratio). Furthermore, since there are too many uncertain factors and there is barely little experience to learn from, project managers should simultaneously deal with high risk issues (Fan, 2010).

In addition, selecting the appropriate methodology and beneficial approach of project management ideology will increase the likelihood of project success (Fan, 2010). Fan advocates that the overall standard of project success is the individual satisfaction of each project team members and project stakeholders. In most cases, if end-users, project manager, team members conclude that their own expectations are satisfied, the project will undoubtedly be accepted as a successful one.

Fan's analysis shows that customer demands change based on three reasons. First, problems occur during communication with clients. Second, the scope prepared and approved in the project definition phase is not fully grasp customers' actual needs because of existing processes and market structure. And finally, customer requirements alter inevitably due to objective factors.

Informed by previous literature, project manager's role includes both technical and management aspects. Even though, a project manager must be a technical elite in reality, distinctive functions of a project manager lie in the management of human (Fan, 2010). Project manager is the core and plays a very crucial role through the way to success. Project managers need to lend an ear to the needs and aspirations of project team members. They need to pursue human-oriented thinking, give emphasis on continuously changing customer voice and communicate frequently with each member in order to finalize a profitable project.

All successful projects share one great characteristic which is the integration of the work of all project team members assisting to the process of effective project management. This valuable integration could only be created by means of a favorable project collaboration and communication. The role of project manager at this point, is to create the convenient environment and then unify all parties as one in order to promote coordination and cooperation which results in generation of the maximum value. The ultimate goal could only

be realized if all project team members are of the same mind which includes working supportive and complementary to each other, being open to share not only explicit but also tacit knowledge and taking extra responsibility when needed (Fan, 2010).

Based on the human resource management abilities, project managers primarily should know their team members closely and then identify their prominent skills, strengths and weaknesses that might make a difference later. This will be really beneficial for the project manager to come through probable problems and guarantee continuation of project in a manageable state. Having these kind of information will make project managers superior and increase the likelihood of project success. Fan (2010) also recommends that even the project is succeeded, there is still room for improvement. Based on this view, when the project is completed, project manager and all other team members should summarize their experiences in a comprehensible format, evaluate their overall performance and come up with lessons learned. These type of implicit knowledge will be really advantageous to apply in forthcoming projects in sectors where there is little mature experiences and lean lessons (Junguo, 2003).

In summary, project managers is expected to comprehend in-depth understanding of modern project management ideology, recognize the strengths and weaknesses of project team members and establish a productive environment in which communication, collaboration and knowledge transfer is promoted. They are simultaneously responsible for the timely and costly management of all project phases under the guidance of project requirements and objectives (Fan, 2010).

Organizations have been making huge investments in projects hoping to get the competitive edge on, grow healthy and increase productivity (Adzmi & Hassan, 2018). Based on these significant investments, project success and failure has become one of the most frequently discussed fields in project management. Even though numerous factors comprising of organizational, human, technical, complexity and quality contribute to the project success, project planning and strategy have a stronger impact. Project manager should determine the appropriate strategy according to the market conditions and business needs, plan efficient use of resources, regularly control scope and manage risks.

The literature argues that there is a significant relationship between project management performance and project success (Fan, 2010; Bryde, 2008; Munns & Bjeirmi, 1996). Based on the argument that projects are used as an effective tool in organizational

strategy implementation, project managers implicitly play an active role in organizational strategy and long term expectations. Even though project manager performance and project success are distinct terms, they are highly inter-related (Mir & Pinnington, 2014).

In addition to thoughts given above, project management itself could be disintegrated into smaller parts which contribute to project management success and in turn overall project performance. These smaller parts might be grouped into three main categories named as project management success factors including project management competence, organizational elements and usage of project management methodologies, methods, tools, techniques (Radujkovic & Sjekavica, 2017). In terms of these comprehensive factors; if organizations have appropriate organizational structure and promotive organizational culture, ensures competent human resources and reasonable in-house competition and uses modern project management methodologies, tools and techniques, then their projects will most probably result in success.

It is significant to note that the relative importance of project management success factors might vary depending on project type, project orientation and number of projects being concurrently managed in organization. For example, organizations in a turbulent market need to start and manage more projects to get competitive advantage, while it is not noteworthy for organizations in a stable environment.

Project management in today's world, is inevitably a field of continuous improvement. It is not only a necessity for that improvement but also an area that seeks improvement itself (Radujkovic & Sjekavica, 2017).

## **2.8. Project Duration and Its Relationship with Project Performance**

Project duration is identified as a central factor in terms of project management (Zwikaël & Unger-Aviram, 2010). It represents the calendar duration of the project, the elapsed time from the initiation to the closure phase of the project. It is the time frame between the estimated project start date and project end date when the project could be delivered. The end is reached either when project objectives have been reached or the project is terminated. Even though most of the projects are temporary in time, there are a considerable number of projects initiated to create lasting deliverables (Uluocak, 2014).

On the other hand, project effort is the cumulative time spent by each and every project team member on the project. Effort is generally measured in person/hour, person/day or person/month. Among these, person/hour is the most convenient one based on the unambiguous small time unit.

In addition to the duration and effort, project postponement is another term referring to the flexibility to postpone the initiation of a project and part of its resources (Sanchez et al., 2017). This strategic decision related to starting, stopping or accelerating projects, might be taken in order to gain time while assessing uncertain payoffs and possible contributions (Benaroch et al., 2007).

Before taking decision to postpone, organizations need to evaluate benefits and risks from both angles. On the one hand, if the project is critically significant to take competitive advantage, postpone decision will retard launch and harm the organization (Fichman et al., 2005). Conversely, if nobody has an exact information related to potential losses that uncertainty can cause, postpone decision can be worthwhile compared to the option of not making a decision (Sanchez et al., 2017). Furthermore, postponement option gives the organization to collect more related information to cope with perceived risks.

Returning to the primary concern, even though it seems that time and effort are similar metrics, actually they are not interchangeable (Bhardwaj et al., 2019). Furthermore, there is not any relationship between these terms.

Project managers should understand that adding more project team members may reduce the overall project duration up to a certain level. But beyond that certain level, adding more project team members will not shorten project duration. Quite the contrary, exceeding the point of reflection would result in prolonged project duration and higher cost (Bhardwaj & Rana, 2016).

The relationship between project duration and team size is explained in detail in Figure 1. Till to the point of reflection, increasing team size will assist in reducing project duration. On the other hand, beyond the point of reflection, increasing team size will culminate in undesirable increase in project duration.

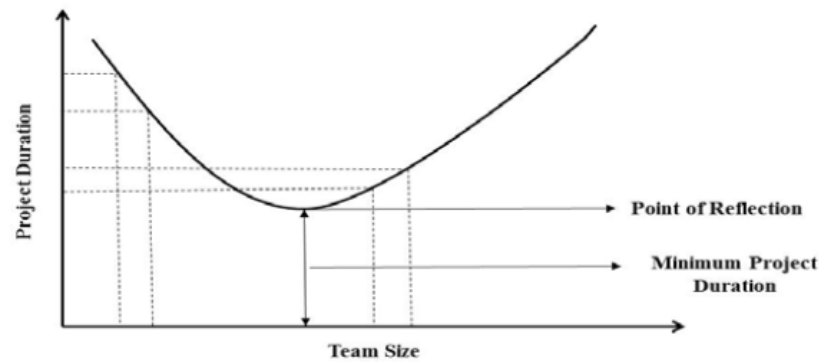


Figure 1 Project Duration and Team Size Relationship

Adding more project team members will create new communication channels and in turn end up with higher integration effort. Project managers ought to understand this critical relationship, decide on the optimal team size and if possible struggle to keep constant team size throughout the project life cycle. It is indispensable for project managers to internalize the project, understand this relationship and settle on the optimal team size.

Dvir et al. (2006) states that there is no one size project. The best practices and learned lessons in one project may not work well in another scenario and vice versa (Zwikael & Unger-Aviram, 2010). Determining team size is not an easy task, yet this would help project managers to commit timelines and achieve success. During this compelling task, they could benefit from work break down structure and Delphi techniques to determine the rightsize.

Since project managers are responsible for the successful completion of project, they face the challenge of estimating project duration and overall effort in the planning phase. The problem is only the functional requirements are available initially and most probably they are also prone to change in time according to customer expectations. And no matter how hard they try, requirements of the project are not static and frequently be updated influenced by market conditions, opponent moves and customer expectations (Putnam & Myers, 2002).

Since each project is unique and possess typical challenges to complete, project manager confront with distinct challenges during project execution to monitor, control and when needed interfere in. From this viewpoint, project managers need to understand their team composition, individual skills and capabilities (Bhardwaj et al., 2019).

Different postulates are presented in the literature concerning the effect of project duration on project success. Wallace et al. (2004) posit that long term projects tend to carry greater risks along the dimensions of requirements, team, and complexity, organizational and market environment. In the same vein, Martin et al. (2007) mentioned that larger projects tend to have longer duration and have difficulties meeting quality and budget limitations, higher complexity based on the allocation of more staff and vendors hired.

According to Taylor et al. (2012) larger projects which require more team members, effective communication and coordination, show a tendency to be more complex and riskier decreasing the likelihood of success. Therefore, larger projects are split into small and mid-size projects in order to eliminate complexity, mitigate risks and increase success ratio.

Contrarily, Zwikael and Unger-Aviram (2010) advocated that large projects lasting more than one year have a promotive effect on team development which will in turn positively affect project success. Project managers have adequate time to establish communication channels and revamp when needed, invest in practices for team development, negotiation and dispute resolution that significantly increase chances of success.

Since team development takes time to yield fruit, the positive effects might not be seen by the end of that specific project. However, constructive effects of team development should be considered as an ongoing incremental process supporting success of projects (Zwikael & Unger-Aviram, 2010).

Similarly, Gefen et al. (2016) state that larger projects are associated with higher project success. Since larger projects are longer in duration, they are supposed to be described in finest detail increasing the chance of proper understanding and precise estimations.

There is ample time for project managers to address unexpected problems and mitigate risks minimizing possible effects on cost and time. Moreover, longer time frame make room for misunderstood specifications, technical difficulties and insufficient testing. In addition to this viewpoint, Cho et al. (2009) argues that short-term projects are more likely to result in with cost overruns.

Gefen et al. (2016) assert that project success is also affected by total cost which is indirectly related to the project duration. Software development frequently requires more

time than planned and developers have difficulties to complete in predefined quality standards (Keil et al., 2013). In case of these quality and time dilemmas, some project members could reduce their output quality and hence a decreased success rate. These dilemmas could be erased in large budget, and relatively long-term projects increasing the overall success change (Gefen et al., 2016).



### 3. RESEARCH MODEL AND HYPOTHESIS

#### 3.1. Research Model

This study is influenced by the theoretical fields of strategic management, human resources management, performance management, organizational theory and organizational behavior. Realizing the relationships between variables will further extend our understanding related to overall project performance. This knowledge will also assist managers where they should concentrate and take necessary or urgent actions in order to come up with better results (Uluocak, 2014).

A framework that summarizes the ideas, variables and relationships explored above can be depicted with the help of the proposed model given below.

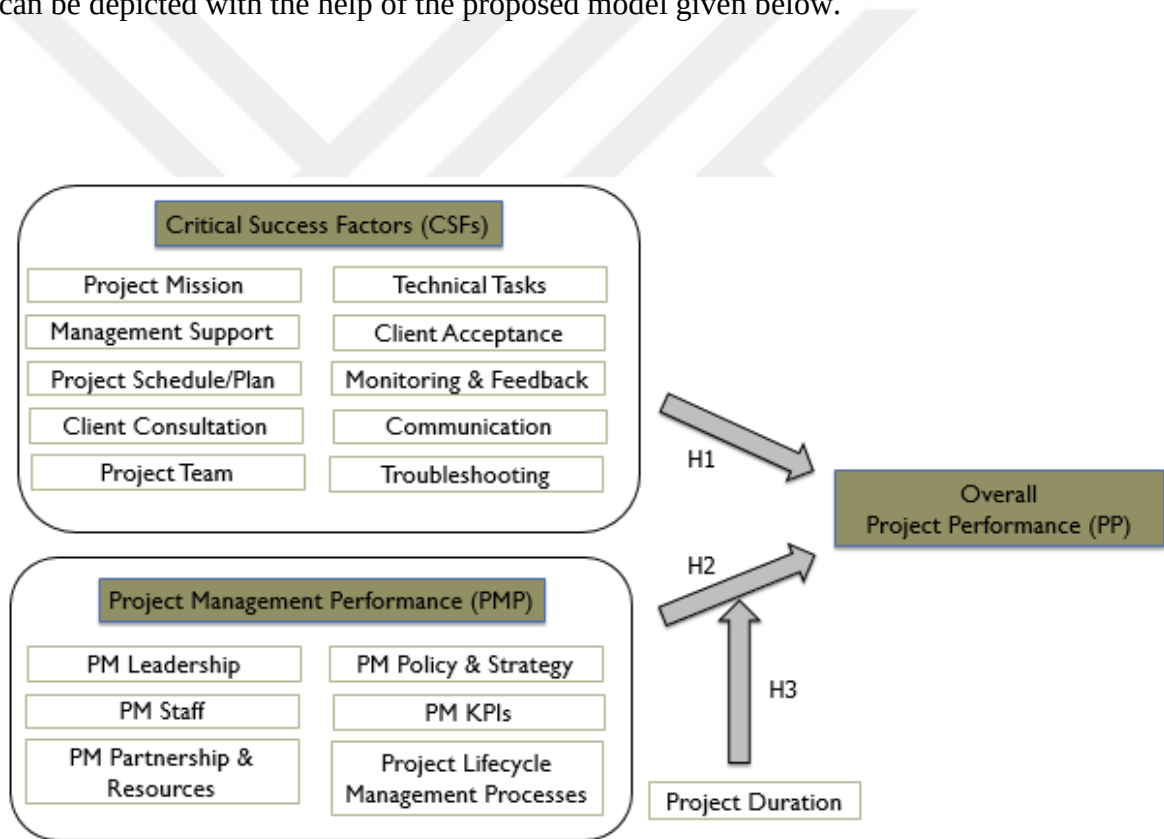


Figure 2 Proposed Research Model

### 3.2. Hypothesis

The independent variables of the study are identified as critical success factors and project management performance.

Critical success factors are demonstrated by Slevin and Pinto, will be measured by the Project Implementation Profile (PIP). This is because, not only they are the ones who established a solid foundation but also the instrument is used by majority of the researchers to collect data (Culler, 2009; Jones, 2007).

The other independent variable of the study, project management performance, will be measured by Project Management Performance Assessment (PMPA) model. All the data will be used for statistical analysis in order to analyze the relationship between independent variables as a whole and project performance in fintech sector.

The dependent variable of the study, overall project performance, will be measured again by the Project Implementation Profile (PIP). In addition to these variables, project duration will be included as the moderating variable in this study.

The hypotheses, which are expected to illustrate possible outcomes, for this study are as follows:

*H1: There is a positive statistical relationship between critical success factors and overall project performance.*

*H2: There is a statistically significant positive relationship between project management performance and overall project performance.*

*H3: Project duration will moderate the relationship between project management performance and overall project performance.*

## **4. RESEARCH DESIGN AND METHODOLOGY**

### **4.1. Research Design**

Critical success factors and project management performance are the independent variables of the study and overall project performance is the dependent one. Project duration will be applied for the moderating variable; gender, age, educational status, total tenure and the role in the project are the demographic variables.

This study will be conducted to investigate the predictive relationship between dependent and independent variables and recognize patterns in data. But the study does not include detailed analysis to prove causes for the observed patterns. Since only the data, distribution of variables and their relationship are wanted to be interpreted, explanatory research design is preferred.

### **4.2. Research Methodology**

#### **4.2.1. Data Collection and Analysis**

Data for this study will be collected from financial technology employees of numerous fintech companies (state banks, private banks, participation banks, insurance companies etc.) located in Turkey.

The target population of the online survey will not be limited to project managers only, but also covers other relevant project stakeholders including software/systems/test engineers, business analysts, project owners and executive directors in order to eliminate the occurrence of response bias and common method variance problem (Podsakoff et al., 2003).

Web-based surveys will be sent to participants all of whom are financial technology professionals working for financial technology sector. A cover letter will be attached to each survey stating that participation is discretionary, data obtained from participants will be confidential, treated in aggregate form and used only for identifying the relationship between dependent and independent variables. Reminder e-mails might be sent to respondents based on the completion ratio of paper-based online surveys.

Data collection from the respondents will be achieved via web-based surveys and based on this, the study is quantitative. The unit of analysis for this research is at individual

level. Since the data will be collected at a single point of time from the participants, this research is cross-sectional.

#### **4.2.2. Measurement**

One of the independent variables of this study, stated as critical success factors, will be measured by means of the Project Implementation Profile instrument developed by Slevin and Pinto. The questionnaire includes 10 different factors established together with declarative statements. Respondents will be asked to score their level of agreement with each statement indicating their understanding according to the latest completed fintech project only by means of a 5-point Likert-scale ranging from 1 = “strongly disagree” to 5 = “strongly agree”.

The other independent variable of this study, stated as project management performance, will be measured by means of Project Management Performance Assessment (PMPA) model developed by Bryde. The questionnaire includes 6 different factors established together with declarative statements. Participants will be asked to score their level of agreement with each statement indicating their understanding according to the latest completed fintech project only by means of a 5-point Likert-scale ranging from 1 = “strongly disagree” to 5 = “strongly agree”.

The dependent variable of this study is overall project performance, will also be measured by means of the Project Implementation Profile instrument developed by Slevin and Pinto. The questionnaire includes 12 declarative statements regarding project outcome and measures overall project performance based on the average of scaled scores of statements.

## 5. PILOT STUDY AND RESEARCH FINDINGS

A pilot study is completed as a first stage trial-run just before jumping into the major study. The purpose of this study is conducting a kind of feasibility study in small-scale version in preparation for the main study.

The motives for conducting such a study are as follows (Van Teijlingen & Hundley, 2001):

- Developing and testing adequacy of research instruments,
- Assessing the feasibility of a full-scale survey,
- Designing a realistic and workable research protocol,
- Establishing whether the sampling frame and technique are effective,
- Identifying problems which might occur using proposed methods,
- Estimating variability in outcomes to help determining sample size,
- Collecting preliminary data,
- Determining what resources are needed for a planned study,
- Assessing the proposed data analysis techniques to uncover potential problems,
- Training a researcher in as many elements of the research process as possible.

In terms of pilot study, 58 people is reached and 50 participants completed the survey resulting a response rate of 86 %. 9 banks and 2 insurance companies operating in both private and public sector in Turkey covered by the pilot study. The data were gathered from IT department employees through personally administered questionnaires from online survey site, Google Forms.

The questionnaire consists of 6 main parts of which the first includes a short and concise brief as well as paving the way that how the questions should be treated and completed. The second part includes demographic questions and project-based questions according to the chosen IT project. Third and fourth parts consist of Critical Success Factors Questionnaire, while fifth part consists of Project Management Performance Questionnaire. And finally the last part includes questions related to Overall Project Performance and Project Success.

There are 6 different types of demographic questions in the study which are about age, gender, education, total tenure, main activity of the company and size of the company. In addition, 4 project based questions, including role in the project, project team size, method

used during project management and project duration, are applied. In order to test scales, 5-point Likert Scale is used in which 1 stands for “definitely not agree” and 5 stands for “definitely agree”. Together with reliability and factor analysis, 3 hypotheses were constructed and tested.

### 5.1. Descriptive Statistics of the Pilot Study

According to the pilot study results, profile of respondents is shown in Table 3.

Table 3 Descriptive Statistics of the Pilot Study (n=50)

| Variables                           | Frequency | Percentage (%) |
|-------------------------------------|-----------|----------------|
| <b>Age Group</b>                    |           |                |
| 20 and below                        | 0         | 0              |
| 21 - 30                             | 13        | 26             |
| 31 - 40                             | 28        | 56             |
| 41 - 50                             | 7         | 14             |
| 51 - 60                             | 2         | 4              |
| 61 and above                        | 0         | 0              |
| <b>Gender</b>                       |           |                |
| Female                              | 19        | 38             |
| Male                                | 31        | 62             |
| <b>Educational Status</b>           |           |                |
| High School/College                 | 1         | 2              |
| Bachelor Degree                     | 25        | 50             |
| Master Degree                       | 23        | 46             |
| Doctorate Degree                    | 1         | 2              |
| <b>Total Tenure (years)</b>         |           |                |
| Less than 1 year                    | 0         | 0              |
| 1 - 5 years                         | 8         | 16             |
| 5 - 10 years                        | 12        | 24             |
| 10 - 15 years                       | 15        | 30             |
| 15 - 20 years                       | 8         | 16             |
| More than 20 years                  | 7         | 14             |
| <b>Main Activity of The Company</b> |           |                |
| Banking                             | 48        | 96             |
| Insurance Companies                 | 2         | 4              |
| Other Companies                     | 0         | 0              |
| <b>Size of The Company</b>          |           |                |
| 500 and below                       | 0         | 0              |
| 501 - 1.000                         | 8         | 16             |

|                                  |    |    |
|----------------------------------|----|----|
| 1.001 - 5.000                    | 2  | 4  |
| 5.001 - 10.000                   | 3  | 6  |
| 10.000 and above                 | 37 | 74 |
| <b>Role in the Project</b>       |    |    |
| Project Team Member              | 30 | 60 |
| Technical/Administrative Manager | 11 | 22 |
| Project Manager                  | 8  | 16 |
| Project Sponsor                  | 1  | 2  |
| <b>Project Team Size</b>         |    |    |
| 10 and below                     | 18 | 36 |
| 11 - 20                          | 18 | 36 |
| 21 - 30                          | 8  | 16 |
| 31 - 40                          | 1  | 2  |
| 41 - 50                          | 0  | 0  |
| 51 - 100                         | 3  | 6  |
| 100 and above                    | 2  | 4  |
| <b>Project Management Method</b> |    |    |
| Waterfall                        | 25 | 50 |
| Agile                            | 25 | 50 |
| <b>Project Duration</b>          |    |    |
| Less than 3 months               | 10 | 20 |
| 3 - 6 months                     | 15 | 30 |
| 6 monts - 1 year                 | 12 | 24 |
| 1 - 3 years                      | 8  | 16 |
| More then 3 years                | 5  | 10 |

## 5.2. Reliability Analysis of the Pilot Study

Reliability analysis is used to show the extent to which the instrument is proper (error-free) and for that reason it can be used across different times giving consistent measurement (Sekaran, 2003). Based on this logic, reliability analysis presents evidence and explanation of consistency and stability with which the instrument having more than one item measures.

It is also called an internal consistency measurement in which results continue to be the same over time despite different target populations and uncontrollable environment (Ünsalan, 2016). It shows that items are homogeneously separated in the measure and capable of measuring the same idea separately. It also supports that the respondents link the same meaning for each item.

An instrument cannot be accepted as reliable if its internal consistency is measured only once. In terms of reliability, internal consistency and stability of the measurement instrument need to be measured at least two times (Blalock, 1979). Based on this argument, in this research, internal consistency of the instruments are measured two times including pilot study and the main study.

Cronbach's alpha coefficient is the most significant test of measuring internal consistency for multi-scaled items. Higher coefficients of Cronbach's alpha shows that the measuring instruments are better. According to Durmuş et al. (2011), Cronbach's alpha coefficient should be greater than or equal to 0.70. When a coefficient number lower than 0.70 is encountered, items are eliminated from the instrument till reaching a value of 0.70. When there is a case in which two items under an inconsistent instrument, the one having the lower relation to the core concept is eliminated while the other is kept in the model (Uluocak, 2014).

The reliability scores of the pilot study, in which all scores are above the threshold value of 0.70, are shown in Table 4. This means that items of each concept are highly consistent and reliable.

Table 4 Reliability Results of the Measurement Instruments in the Pilot Study

| Measurement Scale                    | Number of Items | Cronbach's Alpha |
|--------------------------------------|-----------------|------------------|
| Critical Success Factors (CSFs)      | 50              | 0,965            |
| Project Management Performance (PMP) | 22              | 0,913            |
| Overall Project Performance (PP)     | 13              | 0,938            |

### 5.3. Factor Analysis of the Pilot Study

Factor analysis is conducted in order to reduce a large number of variables to a meaningful, explainable and manageable set of factors. Actually, it is a statistical method applied to describe variability among observed variables in terms of potentially lower number of unobserved (underlying) variables called, principal factors or factors. Factor

analysis aims to find underlying (latent) variables from the model in which observed variables are articulated as linear combinations of both factors and error terms.

Even though there are different types of methods to extract factors, principal-component analysis (PCA) method is the most common one applied by researchers. PCA is used to convert variables into a set of combined variables that are not correlated to one another (Sekaran, 2003). PCA is useful when the number of variables are high and it is believed that these variables are correlated with one another. Principal components, the lower number of variables, will explain the variance in observed variables.

In this method, the maximum variance is extracted and put into the first factor. Then, variance explained by the first factor is removed and maximum variance for the second factor is started to be extracted. This process continues up to the last factor. Eigenvalues are used to understand the variance explained by a particular factor out of the total variance. If eigenvalues are greater than one it is considered as a factor, while eigenvalues less than one is not accepted as a factor and eliminated from the model.

Kaiser-Meyer-Olkin Sampling Adequacy Coefficient (KMO) and Bartlett's Test of Sphericity are two critical stages of conducting PCA. According to Hair et al. (2006), KMO coefficient should be greater than or equal to 0,50, while the upper limit of statistical significance of Bartlett's test in Social Sciences is agreed upon is 0,05.

Based on this argument, for the pilot study, PCA is performed in order to understand how many different dimensions respondents recognized and whether they feel the same in which the scale was originally developed.

50 items of CSFs were entered into PCA and based on the cross loading elimination, 20 items were remained after a number of iterations. According to the results of factor loadings, 20 items of CSFs were decreased to 6 components. In terms of pilot study, factor analysis results of CSFs is summarised in Table 5. KMO coefficient (0,68) is greater than the critical value of 0,5. In addition, the Bartlett's Test is also significant. As can be seen, the total variance explained is % 74,8.

The component formation in Table 5 is very much unlike with the original component structure of Project Implementation Profile (PIP) survey. Since the component formation is departed from previous studies, original component structure was used in performing data analysis based on the fact that the research model and hypotheses are

developed on existing theories. The factor analysis is provided as a supplementary work in the pilot study.

Table 5 Factor Analysis of CSFs in the Pilot Study

| Component                           | Item   | Item Loading | Variance Explained |
|-------------------------------------|--------|--------------|--------------------|
| CSF I                               | CSF 21 | 0,752        | 33,8               |
|                                     | CSF 38 | 0,669        |                    |
|                                     | CSF 13 | 0,666        |                    |
|                                     | CSF 12 | 0,640        |                    |
|                                     | CSF 15 | 0,627        |                    |
| CSF II                              | CSF 4  | 0,874        | 12,1               |
|                                     | CSF 1  | 0,847        |                    |
|                                     | CSF 5  | 0,835        |                    |
|                                     | CSF 3  | 0,639        |                    |
| CSF III                             | CSF 35 | 0,903        | 10,0               |
|                                     | CSF 19 | 0,742        |                    |
|                                     | CSF 33 | 0,664        |                    |
|                                     | CSF 34 | 0,541        |                    |
| CSF IV                              | CSF 47 | 0,881        | 7,0                |
|                                     | CSF 48 | 0,712        |                    |
| CSF V                               | CSF 7  | 0,864        | 6,3                |
|                                     | CSF 6  | 0,842        |                    |
|                                     | CSF 9  | 0,616        |                    |
| CSF VI                              | CSF 46 | 0,735        | 5,3                |
|                                     | CSF 32 | -0,593       |                    |
| <b>TOTAL</b>                        |        |              | <b>74,8</b>        |
| KMO Coefficient                     |        |              | 0,680              |
| Bartlett's Test of Sphericity - Sig |        |              | 0,000              |

22 items of PMP were entered into PCA and based on the cross loading elimination, 20 items were remained after one iteration. According to the results of factor loadings, 20 items of PMP were decreased to 5 components. In terms of pilot study, factor analysis results of PMP is summarised in Table 6. KMO coefficient (0,768) is greater than the critical value of 0,5. In addition, the Bartlett's Test is also significant. As can be seen, the total variance explained is % 74.

Table 6 Factor Analysis of PMP in the Pilot Study

| Component                           | Item   | Item Loading | Variance Explained |
|-------------------------------------|--------|--------------|--------------------|
| PMP I                               | PMP 18 | 0,806        | 41,5               |
|                                     | PMP 15 | 0,791        |                    |
|                                     | PMP 19 | 0,768        |                    |
|                                     | PMP 16 | 0,734        |                    |
|                                     | PMP 17 | 0,697        |                    |
|                                     | PMP 10 | 0,670        |                    |
|                                     | PMP 14 | 0,631        |                    |
|                                     | PMP 20 | 0,615        |                    |
| PMP II                              | PMP 1  | 0,812        | 10,3               |
|                                     | PMP 2  | 0,710        |                    |
|                                     | PMP 11 | 0,571        |                    |
| PMP III                             | PMP 5  | 0,802        | 8,8                |
|                                     | PMP 7  | 0,657        |                    |
| PMP IV                              | PMP 6  | 0,838        | 7,3                |
| PMP V                               | PMP 21 | 0,881        | 5,9                |
|                                     | PMP 3  | 0,809        |                    |
|                                     | PMP 8  | 0,772        |                    |
|                                     | PMP 22 | 0,685        |                    |
|                                     | PMP 9  | 0,534        |                    |
|                                     | PMP 12 | 0,514        |                    |
| <b>TOTAL</b>                        |        |              | <b>74,0</b>        |
| KMO Coefficient                     |        |              | 0,768              |
| Bartlett's Test of Sphericity - Sig |        |              | 0,000              |

13 items of overall PP were entered into PCA and based on the cross loading elimination, 10 items were remained after two iterations. According to the results of factor loadings, 10 items of overall PP were decreased to 3 components. In terms of pilot study, factor analysis results of overall PP is summarised in Table 7. KMO coefficient (0,862) is greater than the critical value of 0,5. In addition, the Bartlett's Test is also significant. As can be seen, the total variance explained is % 81,8.

Table 7 Factor Analysis of Overall PP in the Pilot Study

| <b>Component</b>                    | <b>Item</b> | <b>Item Loading</b> | <b>Variance Explained</b> |
|-------------------------------------|-------------|---------------------|---------------------------|
| PP I                                | PP 12       | 0,967               | 60,9                      |
|                                     | PP 13       | 0,920               |                           |
|                                     | PP 11       | 0,778               |                           |
|                                     | PP 10       | 0,539               |                           |
| PP II                               | PP 4        | 0,994               | 10,9                      |
|                                     | PP 3        | 0,670               |                           |
|                                     | PP 5        | 0,572               |                           |
| PP III                              | PP 9        | 0,939               | 10,0                      |
|                                     | PP 8        | 0,856               |                           |
|                                     | PP 6        | 0,660               |                           |
| <b>TOTAL</b>                        |             |                     | <b>81,8</b>               |
| KMO Coefficient                     |             |                     | 0,862                     |
| Bartlett's Test of Sphericity - Sig |             |                     | 0,000                     |

## 6. RESEARCH FINDINGS OF THE MAIN STUDY

The aim of this chapter is to exhibit an effort for understanding the determinants of perceived overall project performance among financial technology employees in Turkey. Exploring the effect of project duration to the relationship between project management performance and project success is also within the scope of the study.

As in the pilot study, the data were again gathered through personally administered questionnaires from online survey site, Google Forms. For the main study, 350 questionnaires were handed out and 284 participants completed the survey resulting a response rate of 81 %. 17 banks and 7 insurance companies operating in both private and public sector in Turkey covered by the main study.

Each respondent filled demographic questionnaire together with instruments including Project Implementation Profile instrument and Project Management Performance Assessment (PMPA) model.

Since there were not any inappropriate responding, all of the questionnaires were used for data analysis. The software that was used in statistical analyses was SPSS (Statistical Package for Social Sciences) version 27. This section covers demographic characteristics, complimentary data analyses and hypothesis testing.

### 6.1. Descriptive Statistics of the Main Study

According to the main study results, profile of respondents is shown in Table 8. When we look at the gender of respondents, 37% (n=104) of them were female and 63% (n=180) of them were male. The 31-40 age interval is significantly covers more than half (n=142) of the total population. On the contrary, there are very limited number of respondents (n=9) who are over 50 years old. The average age of 284 participants was approximately 33, showing that the respondents were mostly senior IT professionals.

In parallel with IT sector needs, almost all of the participants were well educated and have at least Bachelor Degree. On the contrary, compared to other demographic characteristics, the tenure of the respondents has a homogeneous distribution. Employees having a tenure of 5-10 years (n=68), 10-15 years (n=65) and more than 20 years (n=70)

constitutes the majority of the participants. In terms of sector distribution, banking dominates the results with n=206 respondents.

When look at the role in the project, %26 (n=73) of the participants were project managers while 45% (n=128) were project team members, 22% (n=64) were technical/administrative managers and 7% (n=19) were project sponsors. In terms of project team size, it is seen that majority of the teams had at most 20 employees. According to the survey, both waterfall and agile project management methods were preferred at very close rates. Finally, according to the main study results, it is seen that 80% of the respondents completed their projects at most 1 year time.

Table 8 Descriptive Statistics of the Main Study (n=284)

| <b>Variables</b>                    | <b>Frequency</b> | <b>Percentage (%)</b> |
|-------------------------------------|------------------|-----------------------|
| <b>Age Group</b>                    |                  |                       |
| 20 and below                        | 0                | 0                     |
| 21 - 30                             | 47               | 17                    |
| 31 - 40                             | 145              | 51                    |
| 41 - 50                             | 83               | 29                    |
| 51 - 60                             | 9                | 3                     |
| 61 and above                        | 0                | 0                     |
| <b>Gender</b>                       |                  |                       |
| Female                              | 104              | 37                    |
| Male                                | 180              | 63                    |
| <b>Educational Status</b>           |                  |                       |
| High School/College                 | 10               | 4                     |
| Bachelor Degree                     | 164              | 57                    |
| Master Degree                       | 105              | 37                    |
| Doctorate Degree                    | 5                | 2                     |
| <b>Total Tenure (years)</b>         |                  |                       |
| Less than 1 year                    | 0                | 0                     |
| 1 - 5 years                         | 31               | 11                    |
| 5 - 10 years                        | 68               | 24                    |
| 10 - 15 years                       | 65               | 23                    |
| 15 - 20 years                       | 50               | 17                    |
| More than 20 years                  | 70               | 25                    |
| <b>Main Activity of The Company</b> |                  |                       |
| Banking                             | 206              | 73                    |
| Insurance Companies                 | 32               | 11                    |
| Other Companies                     | 46               | 16                    |
| <b>Size of The Company</b>          |                  |                       |

|                                  |     |    |
|----------------------------------|-----|----|
| 500 and below                    | 39  | 14 |
| 501 - 1.000                      | 28  | 10 |
| 1.001 - 5.000                    | 49  | 17 |
| 5.001 - 10.000                   | 13  | 4  |
| 10.000 and above                 | 155 | 55 |
| <b>Role in the Project</b>       |     |    |
| Project Team Member              | 128 | 45 |
| Technical/Administrative Manager | 64  | 22 |
| Project Manager                  | 73  | 26 |
| Project Sponsor                  | 19  | 7  |
| <b>Project Team Size</b>         |     |    |
| 10 and below                     | 118 | 41 |
| 11 - 20                          | 82  | 29 |
| 21 - 30                          | 37  | 13 |
| 31 - 40                          | 10  | 4  |
| 41 - 50                          | 5   | 2  |
| 51 - 100                         | 17  | 6  |
| 100 and above                    | 15  | 5  |
| <b>Project Management Method</b> |     |    |
| Waterfall                        | 130 | 46 |
| Agile                            | 154 | 54 |
| <b>Project Duration</b>          |     |    |
| Less than 3 months               | 58  | 21 |
| 3 - 6 months                     | 89  | 31 |
| 6 monts - 1 year                 | 79  | 28 |
| 1 - 3 years                      | 49  | 17 |
| More then 3 years                | 9   | 3  |

In addition, the distribution of the companies that the respondents work with is shown in Table 9.

Table 9 Distrubition of the Companies that Respondents Work With

| Group               | Corporation                        | Frequency | Percentage (%) |
|---------------------|------------------------------------|-----------|----------------|
| Public Bank         | T.C. Ziraat Bankası A.Ş.           | 95        | 33,4           |
|                     | Türkiye Halk Bankası A.Ş.          |           |                |
|                     | Türkiye Vakıflar Bankası T.A.O.    |           |                |
| Private Bank        | Akbank T.A.Ş.                      | 96        | 33,8           |
|                     | Anadolubank A.Ş.                   |           |                |
|                     | Denizbank A.Ş.                     |           |                |
|                     | Fibabanka A.Ş.                     |           |                |
|                     | ING Bank A.Ş.                      |           |                |
|                     | Şekerbank T.A.Ş.                   |           |                |
|                     | Türk Ekonomi Bankası A.Ş.          |           |                |
|                     | Türkiye Garanti Bankası A.Ş.       |           |                |
|                     | Türkiye İş Bankası A.Ş.            |           |                |
|                     | Yapı ve Kredi Bankası A.Ş.         |           |                |
|                     | QNB Finansbank A.Ş.                |           |                |
| Participation Bank  | Kuveyt Türk Katılım Bankası A.Ş.   | 15        | 5,3            |
|                     | Türkiye Emlak Katılım Bankası A.Ş. |           |                |
|                     | Vakıf Katılım Bankası A.Ş.         |           |                |
| Insurance Companies | Allianz Hayat ve Emeklilik A.Ş.    | 32        | 11,3           |
|                     | Anadolu Hayat Emeklilik A.Ş.       |           |                |
|                     | Avivasa Emeklilik ve Hayat A.Ş.    |           |                |
|                     | Eureka Sigorta A.Ş.                |           |                |
|                     | Garanti Emeklilik ve Hayat A.Ş.    |           |                |
|                     | Mapfre Yaşam Sigorta A.Ş.          |           |                |
|                     | Türkiye Hayat ve Emeklilik A.Ş.    |           |                |
| Other               | FinTech Companies (SMEs)           | 46        | 16,2           |

## 6.2. Reliability Analysis of the Main Study

As stated in the pilot study, internal consistency and stability of instruments need to be measured more than once in order to be accepted as reliable (Blalock, 1979). Based on this argument, reliability analysis was performed again for each of three instruments in order to check consistency and stability. Results are used to understand whether items are homogeneously separated and whether respondents gave the same meaning to the items or not.

In order to measure internal consistency for multi-scaled items, again, Cronbach's alpha coefficient is used. The threshold value for Cronbach's alpha coefficient is 0.70 and higher coefficients states that measuring instruments are better (Durmuş et al., 2011).

The reliability scores of the main study, shown in Table 10, states that all scores are above the Cronbach's alpha coefficient's threshold value of 0.70. This means that all the instruments were found highly consistent and reliable with their original items without excluding any.

Table 10 Reliability Results of the Measurement Instruments in the Main Study

| <b>Measurement Scale</b>             | <b>Number of Items</b> | <b>Cronbach's Alpha</b> |
|--------------------------------------|------------------------|-------------------------|
| Critical Success Factors (CSFs)      | 50                     | 0,966                   |
| Project Management Performance (PMP) | 22                     | 0,897                   |
| Overall Project Performance (PP)     | 13                     | 0,924                   |

### **6.3. Factor Analysis of the Main Study**

As previously stated in the pilot study, factor analysis is applied in order to obtain meaningful set of factors in an instrument from a large number of variables. According to this statistical method, it is assumed that the items in the same category have similar properties and these properties will become the label of new group items. At the end of the analysis, items will occur as new variables under the labels.

General purpose of the factor analysis is to reduce the number of items in the instrument by categorizing them according to similar properties. Without factor analysis, researcher can not decide the number of new groups and items. Even though there are different types of methods, principal-component analysis (PCA) method is the most common and useful one applied by researchers when the number of variables are high. But in order to conduct a PCA, at first conditions related to two values should be satisfied.

These critical values are Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Significance of Bartlett's Test of Sphericity. If KMO coefficient is greater than or equal to 0,50, it implies the variable set used in the model is homogenous while lower values mean the existence of heterogeneous variables. Bartlett's test of sphericity checks the correlation matrix, which is the main data input of factor analysis, is significant or not. In social sciences, the upper limit of statistical significance for Bartlett's test agreed upon is 0,05. If the result is not significant, factor analysis cannot be applied.

In this method, at first the maximum variance is extracted and put into the first factor. Then, variance explained by the first factor is removed and maximum variance for the second factor is started to be extracted. This process continues up to the last factor whose values are greater than 1 (Kaiser, 1974).

Based on this argument, PCA is performed for the main study in order to understand whether respondents feel the same in which the scale was originally developed or not. 50 items of CSFs were entered into PCA and according to the cross loading elimination, none of the items were eliminated. According to the results of factor loadings, 50 items of CSFs were grouped under 10 components. In terms of main study, factor analysis results of CSFs is summarised in Table 11. KMO coefficient (0,93) is greater than the critical value of 0,5. In addition, the Bartlett's Test is also significant. As can be seen, the total variance explained is % 66,3.

Table 11 Factor Analysis of CSFs in the Main Study

| Component | Item   | Item Loading | Variance Explained |
|-----------|--------|--------------|--------------------|
| CSF I     | CSF 40 | 0,672        | 38,127             |
|           | CSF 41 | 0,671        |                    |
|           | CSF 43 | 0,662        |                    |
|           | CSF 39 | 0,605        |                    |
|           | CSF 37 | 0,522        |                    |
|           | CSF 44 | 0,517        |                    |
|           | CSF 42 | 0,492        |                    |
|           | CSF 38 | 0,437        |                    |
|           | CSF 36 | 0,351        |                    |
| CSF II    | CSF 4  | 0,802        | 5,008              |
|           | CSF 3  | 0,756        |                    |
|           | CSF 5  | 0,756        |                    |
|           | CSF 1  | 0,713        |                    |
| CSF III   | CSF 29 | 0,776        | 4,796              |

|                                     |        |        |             |
|-------------------------------------|--------|--------|-------------|
|                                     | CSF 27 | 0,727  |             |
|                                     | CSF 28 | 0,630  |             |
|                                     | CSF 30 | 0,449  |             |
| CSF IV                              | CSF 20 | 0,740  |             |
|                                     | CSF 19 | 0,648  |             |
|                                     | CSF 18 | 0,542  | 3,502       |
|                                     | CSF 31 | 0,516  |             |
|                                     | CSF 32 | 0,455  |             |
|                                     | CSF 17 | 0,378  |             |
| CSF V                               | CSF 9  | -0,793 |             |
|                                     | CSF 8  | -0,775 |             |
|                                     | CSF 10 | -0,696 | 3,245       |
|                                     | CSF 7  | -0,666 |             |
|                                     | CSF 6  | -0,664 |             |
| CSF VI                              | CSF 12 | 0,685  |             |
|                                     | CSF 14 | 0,655  |             |
|                                     | CSF 15 | 0,641  |             |
|                                     | CSF 13 | 0,588  | 2,699       |
|                                     | CSF 11 | 0,528  |             |
|                                     | CSF 16 | 0,421  |             |
|                                     | CSF 2  | 0,416  |             |
| CSF VII                             | CSF 34 | -0,474 |             |
|                                     | CSF 50 | -0,423 |             |
|                                     | CSF 49 | -0,388 | 2,550       |
|                                     | CSF 48 | -0,386 |             |
| CSF VIII                            | CSF 35 | 0,721  |             |
|                                     | CSF 33 | 0,694  | 2,191       |
| CSF IX                              | CSF 47 | 0,536  |             |
|                                     | CSF 46 | 0,465  | 2,171       |
|                                     | CSF 45 | 0,349  |             |
| CSF X                               | CSF 24 | 0,635  |             |
|                                     | CSF 23 | 0,535  |             |
|                                     | CSF 21 | 0,528  | 2,077       |
|                                     | CSF 26 | 0,424  |             |
|                                     | CSF 22 | 0,385  |             |
|                                     | CSF 25 | 0,359  |             |
| <b>TOTAL</b>                        |        |        | <b>66,3</b> |
| KMO Coefficient                     |        |        | 0,937       |
| Bartlett's Test of Sphericity - Sig |        |        | 0,000       |

22 items of PMP were entered into PCA and according to the cross loading elimination, none of the items were eliminated. According to the results of factor loadings, 22 items of PMP were grouped under 6 components. In terms of main study, factor analysis results of PMP is summarised in Table 12. KMO coefficient (0,87) is greater than the critical

value of 0,5. In addition, the Bartlett's Test is also significant. As can be seen, the total variance explained is % 66,5.

Table 12 Factor Analysis of PMP in the Main Study

| Component                           | Item   | Item Loading | Variance Explained |
|-------------------------------------|--------|--------------|--------------------|
| PMP I                               | PMP 21 | 0,741        | 35,516             |
|                                     | PMP 22 | 0,739        |                    |
|                                     | PMP 18 | 0,659        |                    |
|                                     | PMP 9  | 0,649        |                    |
|                                     | PMP 17 | 0,518        |                    |
|                                     | PMP 19 | 0,480        |                    |
| PMP II                              | PMP 10 | 0,863        | 8,167              |
|                                     | PMP 16 | 0,680        |                    |
|                                     | PMP 11 | 0,618        |                    |
|                                     | PMP 20 | 0,609        |                    |
|                                     | PMP 15 | 0,477        |                    |
| PMP III                             | PMP 5  | 0,877        | 7,172              |
|                                     | PMP 4  | -0,465       |                    |
| PMP IV                              | PMP 2  | -0,839       | 5,940              |
|                                     | PMP 1  | -0,705       |                    |
|                                     | PMP 3  | -0,579       |                    |
| PMP V                               | PMP 13 | 0,830        | 5,117              |
|                                     | PMP 12 | 0,795        |                    |
|                                     | PMP 14 | 0,512        |                    |
|                                     | PMP 6  | 0,469        |                    |
| PMP VI                              | PMP 7  | -0,784       | 4,669              |
|                                     | PMP 8  | -0,464       |                    |
| <b>TOTAL</b>                        |        |              | <b>66,5</b>        |
| KMO Coefficient                     |        |              | 0,876              |
| Bartlett's Test of Sphericity - Sig |        |              | 0,000              |

13 items of overall PP were entered into PCA and according to the cross loading elimination, none of the items were eliminated. According to the results of factor loadings, 13 items of overall PP were grouped under 2 components. In terms of main study, factor analysis results of overall PP is summarised in Table 13. KMO coefficient (0,92) is greater than the critical value of 0,5. In addition, the Bartlett's Test is also significant. As can be seen, the total variance explained is % 68,1.

Table 13 Factor Analysis of Overall PP in the Main Study

| Component                           | Item  | Item Loading | Variance Explained |
|-------------------------------------|-------|--------------|--------------------|
| PP I                                | PP 7  | 0,906        | 56,377             |
|                                     | PP 4  | 0,882        |                    |
|                                     | PP 12 | 0,861        |                    |
|                                     | PP 11 | 0,847        |                    |
|                                     | PP 5  | 0,828        |                    |
|                                     | PP 10 | 0,775        |                    |
|                                     | PP 3  | 0,769        |                    |
|                                     | PP 13 | 0,664        |                    |
|                                     | PP 6  | 0,539        |                    |
| PP II                               | PP 1  | 0,910        | 11,755             |
|                                     | PP 2  | 0,839        |                    |
|                                     | PP 8  | 0,719        |                    |
|                                     | PP 9  | 0,630        |                    |
|                                     |       |              |                    |
| <b>TOTAL</b>                        |       |              | <b>68,1</b>        |
| KMO Coefficient                     |       |              | 0,928              |
| Bartlett's Test of Sphericity - Sig |       |              | 0,000              |

#### 6.4. Measurement Validity

The root of validity is derived from a Latin word, *validus*, meaning strong. And validity is the extent to which the scores from a measurement tool represent the variable they are intended to. In other words, the validity of a measure is the degree to which the tool measures what it claims to measure. It is based on collecting various kinds of data and thus evidence in detail.

Even though there are many different types of validity; construct validity, content validity and face validity were applied in this study. In terms of face and content validity, English survey questions were primarily translated into Turkish and then Turkish survey questions were translated back into English. All translations were checked with 2 different interpreters in terms of acceptability and adequacy balance. After making revisions, English survey questions together with their Turkish translations were sent to 3 different professors, their feedback was taken and appropriate revisions were made in order to prevent shift of meaning.

In terms of construct validity, convergent and discriminant validities were checked. In order to ensure convergent validity, correlation coefficients among each scale were

checked. Even though the correlation coefficient above 0.70 is usually recommended, values equal to or above 0.50 are accepted in terms of convergent validity (Carlson & Herdman, 2012). Based on this information, convergent validities of all three scales are found acceptable.

And to ensure discriminant validity, the extent to which two scales overlap is calculated by dividing the correlation between scales to square root of reliability multiplication of each scale. Even though there is no standard value for discriminant validity, a result less than 0.85 is accepted as an indicator of discriminant validity. Based on this information,

- the extent to which CSF and PMP overlap was calculated as 0.74,
- the extent to which CSF and overall PP overlap was calculated as 0.75,
- the extent to which PMP and overall PP overlap was calculated as 0.57.

Based on the above results, discriminant validities of all three scales are found acceptable.

### 6.5. Hypothesis Testing

Regression analysis is a statistical method used to check the existence of the relationship between a dependent variable and one or more independent variables. And if any relationship is obtained, regression analysis, a mathematical declaration of the relation, will estimate the strength of this relationship. If the analysis includes more than one variable, it is called multiple regression analysis. According to Durmuş et al. (2011), multiple regression and correlation analysis have the following stages:

- **Linearity:** It occurs when a relationship exists between dependent variable and an independent variable. When the power of relationship is greater than or equal to 0,70, it means there exists a linearity. If the power of relationship is lower than 0,70, then the independent variable is eliminated from the model.
- **Multicollinearity:** It occurs when a relationship exists between independent variables. If the strength of the relationship between independent variables is greater than 0,70, it means these two variables are dependent to each other. And in this

problematic case, the independent variable whose relationship with the dependent variable is lower is eliminated from the model.

- **Exploratory Power of the Model and Validity:** Exploratory power of the model is measured by Adjusted R Square value. If Adjusted R Square value is greater than 0,49, the model is accepted as powerful. On the other hand, total validity of the model is measured by F Test. If F Test is significant, it indicates the overall model is statistically valid.
- **Contribution of External Variable to the Exploratory Power of the Model:** Insignificant Betas are eliminated by applying T test.

Since there is more than one independent variable in the research model, multicollinearity need to be checked. Based on this argument and stages referred above, correlation analysis was conducted in order to check linearity and multicollinearity between variables.

But, since, all of the variables have different number of items (CSF-50 items, PMP-22 items, overall PP-13 items), averages were used instead of total scores for comparison. Both dependent and independent variable averages were entered into correlation analysis and results are summarised in Table 14.

Table 14 Correlation Analysis between Variables

|                        |                     | CSF    | PMP    | Overall PP |
|------------------------|---------------------|--------|--------|------------|
|                        |                     | Mean   | Mean   | Mean       |
| <b>CSF Mean</b>        | Pearson Correlation | 1      | .689** | .710**     |
|                        | Sig. (2-tailed)     |        | 0,000  | 0,000      |
|                        | N                   | 284    | 284    | 284        |
| <b>PMP Mean</b>        | Pearson Correlation | .689** | 1      | .524**     |
|                        | Sig. (2-tailed)     | 0,000  |        | 0,000      |
|                        | N                   | 284    | 284    | 284        |
| <b>Overall PP Mean</b> | Pearson Correlation | .710** | .524** | 1          |
|                        | Sig. (2-tailed)     | 0,000  | 0,000  |            |
|                        | N                   | 284    | 284    | 284        |

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

Pearson correlation coefficient between CSF mean and overall PP mean (0,710) is greater than the threshold value of 0,7 showing the linear relationship. On the other hand,

Pearson correlation coefficient between PMP mean and overall PP mean (0,524) is below the threshold value of 0,7 showing non-linearity. Since there are only two independent variables in the research model, even though there exists a non-linearity, none of the independent variables were eliminated from the model. But, this situation will be tolerated by accepting a lower explanatory power of the model (Deniz, 2010).

Then the threat of multicollinearity was checked in order to determine any possible linear relation between independent variables. Pearson correlation coefficient between CSF mean and PMP mean (0,689) is below the critical value of 0,7 proving that independent variables were not linearly related and there was no multicollinearity.

### 6.5.1. Hypothesis 1

*H1- There is a positive statistical relationship between critical success factors (CSFs) and overall project performance (PP)*

The first hypothesis was tested by running a single regression between the independent variable named critical success factors, and the core concept of the model, overall project performance.

When we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as 0,710. This value indicates that critical success factors has linearity with overall project performance.

**Pearson Correlation Coefficient** = 0.710 > 0.7 (Linear relationship)

#### Descriptive Statistics

|          | Mean  | Std. Deviation | N   |
|----------|-------|----------------|-----|
| PP Mean  | 3,974 | 0,553          | 284 |
| CSF Mean | 3,875 | 0,505          | 284 |

### Correlations

|                     |          | PP Mean | CSF Mean |
|---------------------|----------|---------|----------|
| Pearson Correlation | PP Mean  | 1,000   | 0,710    |
|                     | CSF Mean | 0,710   | 1,000    |
| Sig. (1-tailed)     | PP Mean  |         | 0,000    |
|                     | CSF Mean | 0,000   |          |
| N                   | PP Mean  | 284     | 284      |
|                     | CSF Mean | 284     | 284      |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictor, critical success factors. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

### ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F       | Sig.              |
|-------|------------|----------------|-----|-------------|---------|-------------------|
| 1     | Regression | 43,673         | 1   | 43,673      | 285,968 | .000 <sup>b</sup> |
|       | Residual   | 43,066         | 282 | 0,153       |         |                   |
|       | Total      | 86,739         | 283 |             |         |                   |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), CSF Mean

Since all previous tests are verified, T-Test significance could be checked for hypothesis. When we check T-Test from Coefficients Table, we saw that critical success factors as an independent variable yield significant result with  $p=.000$  value within 95% confidence interval. Its standardized beta coefficient is positive (0,710) indicating the direction of the relationship between critical success factors and overall project performance.

**Critical Success Factors Significance** = 0.000 < 0.05 (Significant)

**Critical Success Factors Standardized Beta Coefficient** = 0.710 (Positive)

**Coefficients<sup>a</sup>**

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  |
|-------|------------|-----------------------------|------------|---------------------------|--------|-------|
|       |            | B                           | Std. Error | Beta                      |        |       |
| 1     | (Constant) | 0,964                       | 0,180      |                           | 5,371  | 0,000 |
|       | CSF Mean   | 0,777                       | 0,046      | 0,710                     | 16,911 | 0,000 |

In order to see the explanatory power of research model, we should check the Adjusted R Square value. In the Model Summary Table, the related value is found as 0,502. Since this value is greater than the threshold value of 0,5, it is accepted that the explanatory power of research model is good. It means that critical success factors, alone, explains %50 of the variance in overall project performance.

**Adjusted R Square** = 0.502 > 0.50 (Explanatory power of the model is good)

**Model Summary<sup>b</sup>**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|---------------|
| 1     | .710 <sup>a</sup> | 0,503    | 0,502             | 0,390                      | 2,069         |

a. Predictors: (Constant), CSF Mean

b. Dependent Variable: PP Mean

Consequently, the regression results indicate that there is a significant and positive statistical relationship between critical success factors and overall project performance.

Therefore **H.1 is accepted.**

### 6.5.2. Hypothesis 2

*H2- There is a statistically significant positive relationship between project management performance (PMP) and overall project performance (PP)*

The second hypothesis was tested by running a single regression between the independent variable named project management performance, and the core concept of the model, overall project performance.

When we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as 0,524. This value indicates that project management performance does not have linearity with overall project performance. But this situation will be tolerated by consenting to a lower explanatory power of the model.

**Pearson Correlation Coefficient** = 0.524 < 0.7 (Non-linear relationship)

#### Descriptive Statistics

|          | Mean  | Std. Deviation | N   |
|----------|-------|----------------|-----|
| PP Mean  | 3,974 | 0,553          | 284 |
| PMP Mean | 3,631 | 0,484          | 284 |

#### Correlations

|                     |          | PP Mean | PMP Mean |
|---------------------|----------|---------|----------|
| Pearson Correlation | PP Mean  | 1,000   | 0,524    |
|                     | PMP Mean | 0,524   | 1,000    |
| Sig. (1-tailed)     | PP Mean  |         | 0,000    |
|                     | PMP Mean | 0,000   |          |
| N                   | PP Mean  | 284     | 284      |
|                     | PMP Mean | 284     | 284      |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictor, project management performance. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

#### ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F       | Sig.  |
|-------|------------|----------------|-----|-------------|---------|-------|
| 1     | Regression | 23,854         | 1   | 23,854      | 106,969 | .000b |
|       | Residual   | 62,885         | 282 | 0,223       |         |       |
|       | Total      | 86,739         | 283 |             |         |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), PMP Mean

Since all previous tests are verified, T-Test significance could be checked for hypothesis. When we check T-Test from Coefficients Table, we saw that critical success

factors as an independent variable yield significant result with  $p=.000$  value within 95% confidence interval. Its standardized beta coefficient is positive (0,524) indicating the direction of the relationship between project management performance and overall project performance.

**Project Management Performance Significance** =  $0.000 < 0.05$  (Significant)

**Project Management Performance Standardized Beta Coefficient** = 0.524 (Positive)

**Coefficients<sup>a</sup>**

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  |
|-------|------------|-----------------------------|------------|---------------------------|--------|-------|
|       |            | B                           | Std. Error | Beta                      |        |       |
| 1     | (Constant) | 1,798                       | 0,212      |                           | 8,472  | 0,000 |
|       | PMP Mean   | 0,599                       | 0,058      | 0,524                     | 10,343 | 0,000 |

In order to see the explanatory power of research model, we should check the Adjusted R Square value. In the Model Summary Table, the related value is found as 0,272. Since this value is below the threshold value of 0,5, it is accepted that the explanatory power of research model is weak. It means that project management performance, alone, explains %27 of the variance in overall project performance. Even though this is not a high value, it is an expected result because of the inexistence of linearity between overall project performance and project management performance.

**Adjusted R Square** =  $0.272 < 0.50$  (Explanatory power of the model is weak)

**Model Summary<sup>b</sup>**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|---------------|
| 1     | .524 <sup>a</sup> | 0,275    | 0,272             | 0,472                      | 1,949         |

a. Predictors: (Constant), PMP Mean

b. Dependent Variable: PP Mean

Consequently, the regression results indicate that there is a significant and positive statistical relationship between project management performance and overall project performance.

Therefore **H.2 is accepted.**

### 6.5.3. Hypothesis 3

*H3- Project duration will moderate the relationship between project management performance (PMP) and overall project performance (PP)*

The third hypothesis was tested by running a hierarchical regression between the independent variable named project management performance, the moderating variable project duration and the core concept of the model, overall project performance.

When we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as -0,197. This value indicates that project duration does not have linearity with overall project performance. But this situation will be tolerated by consenting to a lower explanatory power of the model.

When we check multi-collinearity between the predictors, project management performance and project duration from Correlations Table, we saw that Pearson correlation coefficient was found as -0,146. This value indicates that there is no multi-collinearity between the predictors.

**Pearson Correlation Coefficient** =  $-0.197 < 0.7$  (Non-linear relationship)

**Pearson Correlation Coefficient** =  $-0.146 < 0.7$  (Non-linear relationship)

#### Descriptive Statistics

|                  | Mean  | Std. Deviation | N   |
|------------------|-------|----------------|-----|
| PP Mean          | 3,974 | 0,553          | 284 |
| PMP Mean         | 3,631 | 0,484          | 284 |
| Project Duration | 2,51  | 1,094          | 284 |

### Correlations

|                     |                  | PP Mean | PMP Mean | Project Duration |
|---------------------|------------------|---------|----------|------------------|
| Pearson Correlation | PP Mean          | 1,000   | 0,524    | -0,197           |
|                     | PMP Mean         | 0,524   | 1,000    | -0,146           |
|                     | Project Duration | -0,197  | -0,146   | 1,000            |
| Sig. (1-tailed)     | PP Mean          |         | 0,000    | 0,000            |
|                     | PMP Mean         | 0,000   |          | 0,007            |
|                     | Project Duration | 0,000   | 0,007    |                  |
| N                   | PP Mean          | 284     | 284      | 284              |
|                     | PMP Mean         | 284     | 284      | 284              |
|                     | Project Duration | 284     | 284      | 284              |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictors, project management performance and project duration. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

### ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F       | Sig.  |
|-------|------------|----------------|-----|-------------|---------|-------|
| 1     | Regression | 23,854         | 1   | 23,854      | 106,969 | .000b |
|       | Residual   | 62,885         | 282 | 0,223       |         |       |
|       | Total      | 86,739         | 283 |             |         |       |
| 2     | Regression | 25,146         | 2   | 12,573      | 57,361  | .000c |
|       | Residual   | 61,593         | 281 | 0,219       |         |       |
|       | Total      | 86,739         | 283 |             |         |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), PMP Mean

c. Predictors: (Constant), PMP Mean, Project Duration

Since all previous tests are verified, T-Test significance could be checked for hypothesis. When we check T-Test from Coefficients Table, we saw that project duration, as a moderating variable, yield significant result with  $p=.016$  value within 95% confidence interval. Its standardized beta coefficient is negative (-0,123) indicating the direction of the relationship between project management performance and overall project performance.

**Project Management Performance Significance** = 0.000 < 0.05 (Significant)

**Project Duration Significance** = 0.016 < 0.05 (Significant)

**Project Management Performance Standardized Beta Coefficient** = 0.506 (Positive)

**Project Duration Standardized Beta Coefficient** = - 0.123 (Negative)

**Coefficients<sup>a</sup>**

| Model |                  | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  |
|-------|------------------|-----------------------------|------------|---------------------------|--------|-------|
|       |                  | B                           | Std. Error | Beta                      |        |       |
| 1     | (Constant)       | 1,798                       | 0,212      |                           | 8,472  | 0,000 |
|       | PMP Mean         | 0,599                       | 0,058      | 0,524                     | 10,343 | 0,000 |
| 2     | (Constant)       | 2,030                       | 0,231      |                           | 8,786  | 0,000 |
|       | PMP Mean         | 0,579                       | 0,058      | 0,506                     | 9,966  | 0,000 |
|       | Project Duration | -0,062                      | 0,026      | -0,123                    | -2,428 | 0,016 |

a. Dependent Variable: PP Mean

In order to see the explanatory power of research model, we should check the Adjusted R Square value. In the Model Summary Table, the related value is found as 0,285. Since this value is below the threshold value of 0,5, it is accepted that the explanatory power of research model is weak. It means that project management performance together with project duration, explain %28 of the variance in overall project performance. Even though this is not a high value, it is an expected result because of the inexistence of linearity between overall project performance and project duration.

**Adjusted R Square** = 0.285 < 0.50 (Explanatory power of the model is weak)

**Model Summary<sup>b</sup>**

| Model | R     | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------|----------|-------------------|----------------------------|---------------|
| 1     | .524a | 0,275    | 0,272             | 0,472                      |               |
| 2     | .538b | 0,290    | 0,285             | 0,468                      | 1,921         |

a. Predictors: (Constant), PMP Mean

b. Predictors: (Constant), PMP Mean, Project Duration

c. Dependent Variable: PP Mean

Consequently, the regression results indicate that project duration moderate the relationship between project management performance and overall project performance. Moreover, project duration has a negative contribution on the overall project performance and negatively affects it.

Therefore **H.3 is accepted.**

#### 6.5.4. Summary of the Hypothesis Testing

Based on the main study results, of which summarized below, all of three hypotheses were accepted.

Table 15 Summary of the Hypothesis Testing

| Hypothesis                                                                                                                                       | Main Study Analysis Result |
|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| H1- There is a positive statistical relationship between critical success factors (CSFs) and overall project performance (PP)                    | Accepted                   |
| H2- There is a statistically significant positive relationship between project management performance (PMP) and overall project performance (PP) | Accepted                   |
| H3- Project duration will moderate the relationship between project management performance (PMP) and overall project performance (PP)            | Accepted                   |

#### 6.6. Additional Work

Although there are a number of demographic variables in this study, total tenure and gender are selected in order to see if there was any difference in results. The main idea behind these additional work and analyses is to find out whether different groups of the same

demographic variable give a different result from the overall results. In this context, the same analyzes were repeated for the selected demographic variable groups and compared with the main study results.

### 6.6.1. Total Tenure Difference Analysis

In terms of total tenure, participants were divided into two sub-groups, less than 10 years and more than 10 years. The number of people with more than 10 years of total tenure is 185, while the number of people with less than 10 years is 99.

#### 6.6.1.1 Total Tenure More Than 10 Years

For the first hypothesis (H1), when we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as 0,723. This value indicates that critical success factors has linearity with overall project performance.

| Correlations        |          |         |          |
|---------------------|----------|---------|----------|
|                     |          | PP Mean | PMP Mean |
| Pearson Correlation | PP Mean  | 1,000   | 0,723    |
|                     | CSF Mean | 0,723   | 1,000    |
| Sig. (1-tailed)     | PP Mean  |         | 0,000    |
|                     | CSF Mean | 0,000   |          |
| N                   | PP Mean  | 185     | 185      |
|                     | CSF Mean | 185     | 185      |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictor, critical success factors. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** =  $0.000 < 0.05$  (Model is statistically valid)

#### ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F       | Sig.  |
|-------|------------|----------------|-----|-------------|---------|-------|
| 1     | Regression | 27,904         | 1   | 27,904      | 200,459 | .000b |
|       | Residual   | 25,473         | 183 | 0,139       |         |       |
|       | Total      | 53,377         | 184 |             |         |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), CSF Mean

When we check T-Test from Coefficients Table, we saw that critical success factors as an independent variable yield significant result with  $p=.000$  value within 95% confidence interval. Its standardized beta coefficient is positive (0,723) indicating the direction of the relationship between critical success factors and overall project performance.

**Critical Success Factors Significance** =  $0.000 < 0.05$  (Significant)

**Critical Success Factors Standardized Beta Coefficient** = 0.723 (Positive)

**Coefficients<sup>a</sup>**

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  |
|-------|------------|-----------------------------|------------|---------------------------|--------|-------|
|       |            | B                           | Std. Error | Beta                      |        |       |
| 1     | (Constant) | 0,851                       | 0,224      |                           | 3,801  | 0,000 |
|       | CSF Mean   | 0,805                       | 0,057      | 0,723                     | 14,158 | 0,000 |

When we check Adjusted R Square value from Model Summary Table, the related value is found as 0,520. Since this value is greater than the threshold value of 0,5, it is accepted that the explanatory power of research model is good. It means that critical success factors, alone, explains %52 of the variance in overall project performance.

**Adjusted R Square** =  $0.520 > 0.50$  (Explanatory power of the model is good)

**Model Summary<sup>b</sup>**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change |
|-------|-------------------|----------|-------------------|----------------------------|-----------------|
| 1     | .723 <sup>a</sup> | 0,523    | 0,520             | 0,373                      | 0,523           |

a. Predictors: (Constant), CSF Mean

b. Dependent Variable: PP Mean

Consequently, as in the main study results, the difference analysis results also indicate that there is a significant and positive statistical relationship between critical success factors and overall project performance. Therefore H.1 is accepted for the participants whose total tenure is more than 10 years.

For the second hypothesis (H2), when, when we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as 0,527. This value indicates

that project management performance does not have linearity with overall project performance.

### Correlations

|                     |          | PP Mean | PMP Mean |
|---------------------|----------|---------|----------|
| Pearson Correlation | PP Mean  | 1,000   | 0,527    |
|                     | PMP Mean | 0,527   | 1,000    |
| Sig. (1-tailed)     | PP Mean  |         | 0,000    |
|                     | PMP Mean | 0,000   |          |
| N                   | PP Mean  | 185     | 185      |
|                     | PMP Mean | 185     | 185      |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictor, project management performance. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

### ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F      | Sig.  |
|-------|------------|----------------|-----|-------------|--------|-------|
| 1     | Regression | 14,826         | 1   | 14,826      | 70,375 | .000b |
|       | Residual   | 38,552         | 183 | 0,211       |        |       |
|       | Total      | 53,377         | 184 |             |        |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), PMP Mean

When we check T-Test from Coefficients Table, we saw that project management performance as an independent variable yield significant result with  $p=.000$  value within 95% confidence interval. Its standardized beta coefficient is positive (0,527) indicating the direction of the relationship between project management performance and overall project performance.

**Project Management Performance Significance** = 0.000 < 0.05 (Significant)

**Project Management Performance Standardized Beta Coefficient** = 0.527 (Positive)

**Coefficients<sup>a</sup>**

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.  |
|-------|------------|-----------------------------|------------|---------------------------|-------|-------|
|       |            | B                           | Std. Error | Beta                      |       |       |
| 1     | (Constant) | 1,782                       | 0,266      |                           | 6,695 | 0,000 |
|       | PMP Mean   | 0,610                       | 0,073      | 0,527                     | 8,389 | 0,000 |

When we check Adjusted R Square value from Model Summary Table, the related value is found as 0,274. Since this value is below the threshold value of 0,5, it is accepted that the explanatory power of research model is weak. It means that project management performance, alone, explains %27 of the variance in overall project performance.

**Adjusted R Square** = 0.274 < 0.50 (Explanatory power of the model is weak)

**Model Summary<sup>b</sup>**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change |
|-------|-------------------|----------|-------------------|----------------------------|-----------------|
| 1     | .527 <sup>a</sup> | 0,278    | 0,274             | 0,458                      | 0,278           |

a. Predictors: (Constant), PMP Mean

b. Dependent Variable: PP Mean

Consequently, as in the main study results, the difference analysis results also indicate that there is a significant and positive statistical relationship between project management performance and overall project performance. Therefore H.2 is accepted for the participants whose total tenure is more than 10 years.

For the third hypothesis (H3), when, when we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as -0,242. This value indicates that project duration does not have linearity with overall project performance.

### Correlations

|                     |                  | PP Mean | PMP Mean | Project Duration |
|---------------------|------------------|---------|----------|------------------|
| Pearson Correlation | PP Mean          | 1,000   | 0,527    | -0,242           |
|                     | PMP Mean         | 0,527   | 1,000    | -0,195           |
|                     | Project Duration | -0,242  | -0,195   | 1,000            |
| Sig. (1-tailed)     | PP Mean          |         | 0,000    | 0,000            |
|                     | PMP Mean         | 0,000   |          | 0,004            |
|                     | Project Duration | 0,000   | 0,004    |                  |
| N                   | PP Mean          | 185     | 185      | 185              |
|                     | PMP Mean         | 185     | 185      | 185              |
|                     | Project Duration | 185     | 185      | 185              |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictors, project management performance and project duration. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

### ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F      | Sig.  |
|-------|------------|----------------|-----|-------------|--------|-------|
| 1     | Regression | 14,826         | 1   | 14,826      | 70,375 | .000b |
|       | Residual   | 38,552         | 183 | 0,211       |        |       |
|       | Total      | 53,377         | 184 |             |        |       |
| 2     | Regression | 15,895         | 2   | 7,947       | 38,590 | .000c |
|       | Residual   | 37,482         | 182 | 0,206       |        |       |
|       | Total      | 53,377         | 184 |             |        |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), PMP Mean

c. Predictors: (Constant), PMP Mean, Project Duration

When we check T-Test from Coefficients Table, we saw that project duration, as a moderating variable, yield significant result with  $p=.024$  value within 95% confidence interval. Its standardized beta coefficient is negative (-0,144) indicating the direction of the relationship between project management performance and overall project performance.

**Project Management Performance Significance** = 0.000 < 0.05 (Significant)

**Project Duration Significance** =  $0.024 < 0.05$  (Significant)

**Project Management Performance Standardized Beta Coefficient** = 0.499 (Positive)

**Project Duration Standardized Beta Coefficient** = - 0.144 (Negative)

**Coefficients<sup>a</sup>**

| Model |                  | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  |
|-------|------------------|-----------------------------|------------|---------------------------|--------|-------|
|       |                  | B                           | Std. Error | Beta                      |        |       |
| 1     | (Constant)       | 1,782                       | 0,266      |                           | 6,695  | 0,000 |
|       | PMP Mean         | 0,610                       | 0,073      | 0,527                     | 8,839  | 0,000 |
| 2     | (Constant)       | 2,088                       | 0,295      |                           | 7,067  | 0,000 |
|       | PMP Mean         | 0,577                       | 0,073      | 0,499                     | 7,876  | 0,000 |
|       | Project Duration | -0,072                      | 0,032      | -0,144                    | -2,279 | 0,024 |

a. Dependent Variable: PP Mean

When we check Adjusted R Square value from Model Summary Table, the related value is found as 0,290. Since this value is below the threshold value of 0,5, it is accepted that the explanatory power of research model is weak. It means that project management performance together with project duration, explain %29 of the variance in overall project performance.

**Adjusted R Square** =  $0.290 < 0.50$  (Explanatory power of the model is weak)

**Model Summary<sup>b</sup>**

| Model | R     | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change |
|-------|-------|----------|-------------------|----------------------------|-----------------|
| 1     | .527a | 0,278    | 0,274             | 0,458                      | 0,278           |
| 2     | .546b | 0,298    | 0,290             | 0,453                      | 0,020           |

a. Predictors: (Constant), PMP Mean

b. Predictors: (Constant), PMP Mean, Project Duration

c. Dependent Variable: PP Mean

Consequently, as in the main study results, the regression results indicate that project duration moderate the relationship between project management performance and overall project performance. Therefore H.3 is accepted for the participants whose total tenure is more than 10 years.

### 6.6.1.2 Total Tenure Less Than 10 Years

For the first hypothesis (H1), when we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as 0,686. This value indicates that critical success factors does not have linearity with overall project performance.

#### Correlations

|                     |          | PP Mean | PMP Mean |
|---------------------|----------|---------|----------|
| Pearson Correlation | PP Mean  | 1,000   | 0,686    |
|                     | CSF Mean | 0,686   | 1,000    |
| Sig. (1-tailed)     | PP Mean  |         | 0,000    |
|                     | CSF Mean | 0,000   |          |
| N                   | PP Mean  | 99      | 99       |
|                     | CSF Mean | 99      | 99       |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictor, critical success factors. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

#### ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df | Mean Square | F      | Sig.  |
|-------|------------|----------------|----|-------------|--------|-------|
| 1     | Regression | 15,586         | 1  | 15,586      | 86,364 | .000b |
|       | Residual   | 17,506         | 97 | 0,180       |        |       |
|       | Total      | 33,092         | 98 |             |        |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), CSF Mean

When we check T-Test from Coefficients Table, we saw that critical success factors as an independent variable yield significant result with  $p=.000$  value within 95% confidence interval. Its standardized beta coefficient is positive (0,686) indicating the direction of the relationship between critical success factors and overall project performance.

**Critical Success Factors Significance** = 0.000 < 0.05 (Significant)

**Critical Success Factors Standardized Beta Coefficient** = 0.686 (Positive)

**Coefficients<sup>a</sup>**

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.  |
|-------|------------|-----------------------------|------------|---------------------------|-------|-------|
|       |            | B                           | Std. Error | Beta                      |       |       |
| 1     | (Constant) | 1,127                       | 0,305      |                           | 3,697 | 0,000 |
|       | CSF Mean   | 0,735                       | 0,079      | 0,686                     | 9,293 | 0,000 |

When we check Adjusted R Square value from Model Summary Table, the related value is found as 0,466. Since this value is below the threshold value of 0,5, it is accepted that the explanatory power of research model is weak. It means that critical success factors, alone, explains %47 of the variance in overall project performance.

**Adjusted R Square** = 0.466 < 0.50 (Explanatory power of the model is weak)

**Model Summary<sup>b</sup>**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change |
|-------|-------------------|----------|-------------------|----------------------------|-----------------|
| 1     | .686 <sup>a</sup> | 0,471    | 0,466             | 0,424                      | 0,471           |

a. Predictors: (Constant), CSF Mean

b. Dependent Variable: PP Mean

Consequently, as in the main study results, the difference analysis results also indicate that there is a significant and positive statistical relationship between critical success factors and overall project performance. Therefore H.1 is accepted for the participants whose total tenure is less than 10 years.

For the second hypothesis (H2), when we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as 0,522. This value indicates that project management performance does not have linearity with overall project performance.

### Correlations

|                     |          | PP Mean | PMP Mean |
|---------------------|----------|---------|----------|
| Pearson Correlation | PP Mean  | 1,000   | 0,522    |
|                     | PMP Mean | 0,522   | 1,000    |
| Sig. (1-tailed)     | PP Mean  |         | 0,000    |
|                     | PMP Mean | 0,000   |          |
| N                   | PP Mean  | 99      | 99       |
|                     | PMP Mean | 99      | 99       |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictor, project management performance. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

### ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df | Mean Square | F      | Sig.  |
|-------|------------|----------------|----|-------------|--------|-------|
| 1     | Regression | 9,018          | 1  | 9,018       | 36,336 | .000b |
|       | Residual   | 24,074         | 97 | 0,248       |        |       |
|       | Total      | 33,092         | 98 |             |        |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), PMP Mean

When we check T-Test from Coefficients Table, we saw that project management performance as an independent variable yield significant result with  $p=.000$  value within 95% confidence interval. Its standardized beta coefficient is positive (0,522) indicating the direction of the relationship between project management performance and overall project performance.

**Project Management Performance Significance** = 0.000 < 0.05 (Significant)

**Project Management Performance Standardized Beta Coefficient** = 0.522 (Positive)

**Coefficients<sup>a</sup>**

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.  |
|-------|------------|-----------------------------|------------|---------------------------|-------|-------|
|       |            | B                           | Std. Error | Beta                      |       |       |
| 1     | (Constant) | 1,817                       | 0,354      |                           | 5,127 | 0,000 |
|       | PMP Mean   | 0,583                       | 0,097      | 0,522                     | 6,028 | 0,000 |

When we check Adjusted R Square value from Model Summary Table, the related value is found as 0,265. Since this value is below the threshold value of 0,5, it is accepted that the explanatory power of research model is weak. It means that project management performance, alone, explains %27 of the variance in overall project performance.

**Adjusted R Square** = 0.265 < 0.50 (Explanatory power of the model is weak)

**Model Summary<sup>b</sup>**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change |
|-------|-------------------|----------|-------------------|----------------------------|-----------------|
| 1     | .522 <sup>a</sup> | 0,273    | 0,265             | 0,498                      | 0,273           |

a. Predictors: (Constant), PMP Mean

b. Dependent Variable: PP Mean

Consequently, as in the main study results, the difference analysis results also indicate that there is a significant and positive statistical relationship between project management performance and overall project performance. Therefore H.2 is accepted for the participants whose total tenure is less than 10 years.

For the third hypothesis (H3), when, when we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as -0,142. This value indicates that project duration does not have linearity with overall project performance.

### Correlations

|                     |                  | PP Mean | PMP Mean | Project Duration |
|---------------------|------------------|---------|----------|------------------|
| Pearson Correlation | PP Mean          | 1,000   | 0,522    | -0,142           |
|                     | PMP Mean         | 0,522   | 1,000    | -0,069           |
|                     | Project Duration | -0,142  | -0,069   | 1,000            |
| Sig. (1-tailed)     | PP Mean          |         | 0,000    | 0,081            |
|                     | PMP Mean         | 0,000   |          | 0,248            |
|                     | Project Duration | 0,081   | 0,248    |                  |
| N                   | PP Mean          | 99      | 99       | 99               |
|                     | PMP Mean         | 99      | 99       | 99               |
|                     | Project Duration | 99      | 99       | 99               |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictors, project management performance and project duration. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

### ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df | Mean Square | F      | Sig.  |
|-------|------------|----------------|----|-------------|--------|-------|
| 1     | Regression | 9,018          | 1  | 9,018       | 36,336 | .000b |
|       | Residual   | 24,074         | 97 | 0,248       |        |       |
|       | Total      | 33,092         | 98 |             |        |       |
| 2     | Regression | 9,387          | 2  | 4,694       | 19,008 | .000c |
|       | Residual   | 23,705         | 96 | 0,247       |        |       |
|       | Total      | 33,092         | 98 |             |        |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), PMP Mean

c. Predictors: (Constant), PMP Mean, Project Duration

When we check T-Test from Coefficients Table, we saw that project duration, as a moderating variable, yield insignificant result with  $p=.225$  value within 95% confidence interval.

**Project Management Performance Significance** = 0.000 < 0.05 (Significant)

**Project Duration Significance** = 0.225 > 0.05 (Not Significant)

**Project Management Performance Standardized Beta Coefficient** = 0.515 (Positive)

**Project Duration Standardized Beta Coefficient** = - 0.106 (Negative)

**Coefficients<sup>a</sup>**

| Model |                  | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.  |
|-------|------------------|-----------------------------|------------|---------------------------|-------|-------|
|       |                  | B                           | Std. Error | Beta                      |       |       |
| 1     | (Constant)       | 1,817                       | 0,354      |                           | 5,127 | 0,000 |
|       | PMP Mean         | 0,583                       | 0,097      | 0,522                     | 6,028 | 0,000 |
| 2     | (Constant)       | 1,977                       | 0,377      |                           | 5,245 | 0,000 |
|       | PMP Mean         | 0,575                       | 0,097      | 0,515                     | 5,944 | 0,000 |
|       | Project Duration | -0,055                      | 0,045      | -0,106                    | 1,222 | 0,225 |

a. Dependent Variable: PP Mean

Consequently, since T-Test yielded insignificant results, the regression results do not indicate that project duration moderate the relationship between project management performance and overall project performance. Therefore H.3 is not accepted for the participants whose total tenure is less than 10 years.

### 6.6.2. Gender Difference Analysis

While the number of female participants is 104, the number of male participants is 180.

#### 6.6.2.1 Female Participants

For the first hypothesis (H1), when we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as 0,714. This value indicates that critical success factors has linearity with overall project performance.

### Correlations

|                     |          | PP Mean | PMP Mean |
|---------------------|----------|---------|----------|
| Pearson Correlation | PP Mean  | 1,000   | 0,714    |
|                     | CSF Mean | 0,714   | 1,000    |
| Sig. (1-tailed)     | PP Mean  |         | 0,000    |
|                     | CSF Mean | 0,000   |          |
| N                   | PP Mean  | 104     | 104      |
|                     | CSF Mean | 104     | 104      |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictor, critical success factors. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

### ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F       | Sig.  |
|-------|------------|----------------|-----|-------------|---------|-------|
| 1     | Regression | 15,434         | 1   | 15,434      | 105,933 | .000b |
|       | Residual   | 14,861         | 102 | 0,146       |         |       |
|       | Total      | 30,296         | 103 |             |         |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), CSF Mean

When we check T-Test from Coefficients Table, we saw that critical success factors as an independent variable yield significant result with  $p=.000$  value within 95% confidence interval. Its standardized beta coefficient is positive (0,714) indicating the direction of the relationship between critical success factors and overall project performance.

**Critical Success Factors Significance** = 0.000 < 0.05 (Significant)

**Critical Success Factors Standardized Beta Coefficient** = 0.714 (Positive)

### Coefficients<sup>a</sup>

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  |
|-------|------------|-----------------------------|------------|---------------------------|--------|-------|
|       |            | B                           | Std. Error | Beta                      |        |       |
| 1     | (Constant) | 0,949                       | 0,295      |                           | 3,218  | 0,002 |
|       | CSF Mean   | 0,779                       | 0,076      | 0,714                     | 10,292 | 0,000 |

When we check Adjusted R Square value from Model Summary Table, the related value is found as 0,505. Since this value is greater than the threshold value of 0,5, it is accepted that the explanatory power of research model is good. It means that critical success factors, alone, explains %51 of the variance in overall project performance.

**Adjusted R Square** = 0.505 > 0.50 (Explanatory power of the model is good)

**Model Summary<sup>b</sup>**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .714 <sup>a</sup> | 0,509    | 0,505             | 0,381                      |

a. Predictors: (Constant), CSF Mean

b. Dependent Variable: PP Mean

Consequently, as in the main study results, the difference analysis results also indicate that there is a significant and positive statistical relationship between critical success factors and overall project performance. Therefore H.1 is accepted for female participants.

For the second hypothesis (H2), when, when we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as 0,684. This value indicates that project management performance does not have linearity with overall project performance.

**Correlations**

|                     |          | PP Mean | PMP Mean |
|---------------------|----------|---------|----------|
| Pearson Correlation | PP Mean  | 1,000   | 0,684    |
|                     | PMP Mean | 0,684   | 1,000    |
| Sig. (1-tailed)     | PP Mean  |         | 0,000    |
|                     | PMP Mean | 0,000   |          |
| N                   | PP Mean  | 104     | 104      |
|                     | PMP Mean | 104     | 104      |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictor, project management performance. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F      | Sig.  |
|-------|------------|----------------|-----|-------------|--------|-------|
| 1     | Regression | 14,154         | 1   | 14,154      | 89,442 | .000b |
|       | Residual   | 16,142         | 102 | 0,158       |        |       |
|       | Total      | 30,296         | 103 |             |        |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), PMP Mean

When we check T-Test from Coefficients Table, we saw that project management performance as an independent variable yield significant result with  $p=.000$  value within 95% confidence interval. Its standardized beta coefficient is positive (0,684) indicating the direction of the relationship between project management performance and overall project performance.

**Project Management Performance Significance** =  $0.000 < 0.05$  (Significant)

**Project Management Performance Standardized Beta Coefficient** = 0.684 (Positive)

Coefficients<sup>a</sup>

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.  |
|-------|------------|-----------------------------|------------|---------------------------|-------|-------|
|       |            | B                           | Std. Error | Beta                      |       |       |
| 1     | (Constant) | 1,352                       | 0,279      |                           | 4,851 | 0,000 |
|       | PMP Mean   | 0,709                       | 0,075      | 0,684                     | 9,457 | 0,000 |

When we check Adjusted R Square value from Model Summary Table, the related value is found as 0,462. Since this value is below the threshold value of 0,5, it is accepted that the explanatory power of research model is weak. It means that project management performance, alone, explains %46 of the variance in overall project performance.

**Adjusted R Square** =  $0.462 < 0.50$  (Explanatory power of the model is weak)

Model Summary<sup>b</sup>

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .684 <sup>a</sup> | 0,467    | 0,462             | 0,397                      |

a. Predictors: (Constant), PMP Mean

b. Dependent Variable: PP Mean

Consequently, as in the main study results, the difference analysis results also indicate that there is a significant and positive statistical relationship between project management performance and overall project performance. Therefore H.2 is accepted for female participants.

For the third hypothesis (H3), when, when we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as -0,274. This value indicates that project duration does not have linearity with overall project performance.

#### Correlations

|                     |                  | PP Mean | PMP Mean | Project Duration |
|---------------------|------------------|---------|----------|------------------|
| Pearson Correlation | PP Mean          | 1,000   | 0,684    | -0,274           |
|                     | PMP Mean         | 0,684   | 1,000    | -0,235           |
|                     | Project Duration | -0,274  | -0,235   | 1,000            |
| Sig. (1-tailed)     | PP Mean          |         | 0,000    | 0,002            |
|                     | PMP Mean         | 0,000   |          | 0,008            |
|                     | Project Duration | 0,002   | 0,008    |                  |
| N                   | PP Mean          | 104     | 104      | 104              |
|                     | PMP Mean         | 104     | 104      | 104              |
|                     | Project Duration | 104     | 104      | 104              |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictors, project management performance and project duration. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F      | Sig.  |
|-------|------------|----------------|-----|-------------|--------|-------|
| 1     | Regression | 14,154         | 1   | 14,154      | 89,442 | .000b |
|       | Residual   | 16,142         | 102 | 0,158       |        |       |
|       | Total      | 30,296         | 103 |             |        |       |
| 2     | Regression | 14,566         | 2   | 7,283       | 46,762 | .000c |
|       | Residual   | 15,730         | 101 | 0,156       |        |       |
|       | Total      | 30,296         | 103 |             |        |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), PMP Mean

c. Predictors: (Constant), PMP Mean, Project Duration

When we check T-Test from Coefficients Table, we saw that project duration, as a moderating variable, yield insignificant result with  $p=.107$  value within 95% confidence interval.

**Project Management Performance Significance** =  $0.000 < 0.05$  (Significant)

**Project Duration Significance** =  $0.107 > 0.05$  (Not Significant)

**Project Management Performance Standardized Beta Coefficient** = 0.655 (Positive)

**Project Duration Standardized Beta Coefficient** = - 0.120 (Negative)

Coefficients<sup>a</sup>

| Model |                  | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  |
|-------|------------------|-----------------------------|------------|---------------------------|--------|-------|
|       |                  | B                           | Std. Error | Beta                      |        |       |
| 1     | (Constant)       | 1,352                       | 0,279      |                           | 4,851  | 0,000 |
|       | PMP Mean         | 0,709                       | 0,075      | 0,684                     | 9,457  | 0,000 |
| 2     | (Constant)       | 1,607                       | 0,318      |                           | 5,054  | 0,000 |
|       | PMP Mean         | 0,680                       | 0,077      | 0,655                     | 8,885  | 0,000 |
|       | Project Duration | -0,056                      | 0,034      | -0,120                    | -1,625 | 0,107 |

a. Dependent Variable: PP Mean

Consequently, since T-Test yielded insignificant results, the regression results do not indicate that project duration moderate the relationship between project management

performance and overall project performance. Therefore H.3 is not accepted for female participants.

#### 6.6.2.2 Male Participants

For the first hypothesis (H1), when we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as 0,707. This value indicates that critical success factors has linearity with overall project performance.

**Correlations**

|                     |          | <b>PP Mean</b> | <b>PMP Mean</b> |
|---------------------|----------|----------------|-----------------|
| Pearson Correlation | PP Mean  | 1,000          | 0,707           |
|                     | CSF Mean | 0,707          | 1,000           |
| Sig. (1-tailed)     | PP Mean  |                | 0,000           |
|                     | CSF Mean | 0,000          |                 |
| N                   | PP Mean  | 180            | 180             |
|                     | CSF Mean | 180            | 180             |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictor, critical success factors. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

**ANOVA<sup>a</sup>**

| <b>Model</b> |            | <b>Sum of Squares</b> | <b>df</b> | <b>Mean Square</b> | <b>F</b> | <b>Sig.</b> |
|--------------|------------|-----------------------|-----------|--------------------|----------|-------------|
| 1            | Regression | 28,215                | 1         | 28,215             | 178,114  | .000b       |
|              | Residual   | 28,197                | 178       | 0,158              |          |             |
|              | Total      | 56,412                | 179       |                    |          |             |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), CSF Mean

When we check T-Test from Coefficients Table, we saw that critical success factors as an independent variable yield significant result with  $p=.000$  value within 95% confidence interval. Its standardized beta coefficient is positive (0,707) indicating the direction of the relationship between critical success factors and overall project performance.

**Critical Success Factors Significance** = 0.000 < 0.05 (Significant)

**Critical Success Factors Standardized Beta Coefficient = 0.707 (Positive)**

**Coefficients<sup>a</sup>**

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  |
|-------|------------|-----------------------------|------------|---------------------------|--------|-------|
|       |            | B                           | Std. Error | Beta                      |        |       |
| 1     | (Constant) | 0,973                       | 0,227      |                           | 4,281  | 0,000 |
|       | CSF Mean   | 0,775                       | 0,058      | 0,707                     | 13,346 | 0,000 |

When we check Adjusted R Square value from Model Summary Table, the related value is found as 0,497. Since this value is below the threshold value of 0,5, it is accepted that the explanatory power of research model is weak. It means that critical success factors, alone, explains %50 of the variance in overall project performance.

**Adjusted R Square = 0.497 < 0.50** (Explanatory power of the model is weak)

**Model Summary<sup>b</sup>**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .707 <sup>a</sup> | 0,500    | 0,497             | 0,398                      |

a. Predictors: (Constant), CSF Mean

b. Dependent Variable: PP Mean

Consequently, as in the main study results, the difference analysis results also indicate that there is a significant and positive statistical relationship between critical success factors and overall project performance. Therefore H.1 is accepted for male participants.

For the second hypothesis (H2), when, when we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as 0,431. This value indicates that project management performance does not have linearity with overall project performance.

### Correlations

|                     |          | PP Mean | PMP Mean |
|---------------------|----------|---------|----------|
| Pearson Correlation | PP Mean  | 1,000   | 0,431    |
|                     | PMP Mean | 0,431   | 1,000    |
| Sig. (1-tailed)     | PP Mean  |         | 0,000    |
|                     | PMP Mean | 0,000   |          |
| N                   | PP Mean  | 180     | 180      |
|                     | PMP Mean | 180     | 180      |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictor, project management performance. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

### ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F      | Sig.  |
|-------|------------|----------------|-----|-------------|--------|-------|
| 1     | Regression | 10,497         | 1   | 10,497      | 40,695 | .000b |
|       | Residual   | 45,915         | 178 | 0,258       |        |       |
|       | Total      | 56,412         | 179 |             |        |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), PMP Mean

When we check T-Test from Coefficients Table, we saw that project management performance as an independent variable yield significant result with  $p=.000$  value within 95% confidence interval. Its standardized beta coefficient is positive (0,431) indicating the direction of the relationship between project management performance and overall project performance.

**Project Management Performance Significance** = 0.000 < 0.05 (Significant)

**Project Management Performance Standardized Beta Coefficient** = 0.431 (Positive)

**Coefficients<sup>a</sup>**

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.  |
|-------|------------|-----------------------------|------------|---------------------------|-------|-------|
|       |            | B                           | Std. Error | Beta                      |       |       |
| 1     | (Constant) | 2,087                       | 0,300      |                           | 6,695 | 0,000 |
|       | PMP Mean   | 0,526                       | 0,082      | 0,431                     | 6,379 | 0,000 |

When we check Adjusted R Square value from Model Summary Table, the related value is found as 0,182. Since this value is below the threshold value of 0,5, it is accepted that the explanatory power of research model is weak. It means that project management performance, alone, explains %18 of the variance in overall project performance.

**Adjusted R Square** = 0.182 < 0.50 (Explanatory power of the model is weak)

**Model Summary<sup>b</sup>**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .431 <sup>a</sup> | 0,186    | 0,182             | 0,507                      |

a. Predictors: (Constant), PMP Mean

b. Dependent Variable: PP Mean

Consequently, as in the main study results, the difference analysis results also indicate that there is a significant and positive statistical relationship between project management performance and overall project performance. Therefore H.2 is accepted for male participants.

For the third hypothesis (H3), when, when we check linearity from Correlations Table, we saw that Pearson correlation coefficient was found as -0,149. This value indicates that project duration does not have linearity with overall project performance.

### Correlations

|                     |                  | PP Mean | PMP Mean | Project Duration |
|---------------------|------------------|---------|----------|------------------|
| Pearson Correlation | PP Mean          | 1,000   | 0,431    | -0,149           |
|                     | PMP Mean         | 0,431   | 1,000    | -0,096           |
|                     | Project Duration | -0,149  | -0,096   | 1,000            |
| Sig. (1-tailed)     | PP Mean          |         | 0,000    | 0,023            |
|                     | PMP Mean         | 0,000   |          | 0,100            |
|                     | Project Duration | 0,023   | 0,100    |                  |
| N                   | PP Mean          | 180     | 180      | 180              |
|                     | PMP Mean         | 180     | 180      | 180              |
|                     | Project Duration | 180     | 180      | 180              |

When we check F-Test from Anova Table, we saw that F-Test is significant ( $p=.000$ ) within 95% confidence interval for predictors, project management performance and project duration. Since the significance value is below the threshold value of 0,05, the overall model is statistically valid.

**F-Test Significance** = 0.000 < 0.05 (Model is statistically valid)

### ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F      | Sig.  |
|-------|------------|----------------|-----|-------------|--------|-------|
| 1     | Regression | 10,497         | 1   | 10,497      | 40,695 | .000b |
|       | Residual   | 45,915         | 178 | 0,258       |        |       |
|       | Total      | 56,412         | 179 |             |        |       |
| 2     | Regression | 11,155         | 2   | 5,578       | 21,814 | .000c |
|       | Residual   | 45,257         | 177 | 0,256       |        |       |
|       | Total      | 56,412         | 179 |             |        |       |

a. Dependent Variable: PP Mean

b. Predictors: (Constant), PMP Mean

c. Predictors: (Constant), PMP Mean, Project Duration

When we check T-Test from Coefficients Table, we saw that project duration, as a moderating variable, yield insignificant result with  $p=.110$  value within 95% confidence interval.

**Project Management Performance Significance** = 0.000 < 0.05 (Significant)

**Project Duration Significance** = 0.110 > 0.05 (Not Significant)

**Project Management Performance Standardized Beta Coefficient** = 0.421 (Positive)

**Project Duration Standardized Beta Coefficient** = - 0.109 (Negative)

**Coefficients<sup>a</sup>**

| Model |                  | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.  |
|-------|------------------|-----------------------------|------------|---------------------------|-------|-------|
|       |                  | B                           | Std. Error | Beta                      |       |       |
| 1     | (Constant)       | 2,087                       | 0,300      |                           | 6,965 | 0,000 |
|       | PMP Mean         | 0,526                       | 0,082      | 0,431                     | 6,379 | 0,000 |
| 2     | (Constant)       | 2,274                       | 0,320      |                           | 7,098 | 0,000 |
|       | PMP Mean         | 0,513                       | 0,082      | 0,421                     | 6,224 | 0,000 |
|       | Project Duration | -0,059                      | 0,036      | -0,109                    | 1,604 | 0,110 |

a. Dependent Variable: PP Mean

Consequently, since T-Test yielded insignificant results, the regression results do not indicate that project duration moderate the relationship between project management performance and overall project performance. Therefore H.3 is not accepted for male participants.

### 6.6.3. Summary of Additional Work

Based on the selected demographic variables, the results of the additional study are summarized below together with their hypothesis acceptance status.

Table 16 Summary of the Additional Work

| <b>Hypothesis</b>                                                                                                                                | <b>Total<br/>Tenure<br/>&gt;<br/>10 Years</b> | <b>Total<br/>Tenure<br/>&lt;<br/>10 Years</b> | <b>Female<br/>Participants</b> | <b>Male<br/>Participants</b> |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|--------------------------------|------------------------------|
| H1- There is a positive statistical relationship between critical success factors (CSFs) and overall project performance (PP)                    | Accepted                                      | Accepted                                      | Accepted                       | Accepted                     |
| H2- There is a statistically significant positive relationship between project management performance (PMP) and overall project performance (PP) | Accepted                                      | Accepted                                      | Accepted                       | Accepted                     |
| H3- Project duration will moderate the relationship between project management performance (PMP) and overall project performance (PP)            | Accepted                                      | Not<br>Accepted                               | Not<br>Accepted                | Not<br>Accepted              |

## 7. CONCLUSION & DISCUSSION

In this section of the study, all of the research findings is interpreted and discussed in detail. Moreover, this section continues with discussion related to implications for management, limitations of the study and suggestions for future research.

### 7.1. Discussion

This study is an attempt for understanding the relationship between perceived project performance and critical success factors in Turkish financial technology sector. The second focus of the study is to explore the nature of the relationship between project management performance and perceived project performance, specific to the relevant sector. Trying to explain whether project duration affects the relationship between project management performance and perceived project performance is in the scope of the study as well.

Although there are many studies in the literature aiming to improve project performance, no fintech-focused research results has been found in Turkish literature. Also, in the literature research results are not consistent related to the relationship between success factors and project performance (Uluocak, 2014; Culler, 2009). Furthermore, the research addressing the relationship between project management performance and project performance is very limited. Based on all of these facts, this study intends to fill the above explained gaps and provide a significant contribution to Turkish business literature.

The data for this study were collected by a web-based survey from financial technology professionals allover Turkey. Although state and private banks constitutes majority of the participants, insurance companies and third party integrator firms were also reached in the scope of fintech sector. The targeted participants were not limited to only project managers; engineers, business analysts, project owners and executive directors were also reached. 17 banks, 7 insurance companies and a wide variety of integrator companies operating in Turkey have been included in this study. Even though the questionnaire was quite long with 95 questions, the number of respondents and rate of return were both quite high, with 284 people and 81 %.

Demographic and project-based results of the study were given in the beginning of the research findings section. Then basic statistical analyses results consisting of reliability and factor analyses were given. Even though reliability of the instruments were previously

calculated by other researchers, based on the fact that data sets might give different reliability results for each scale, they were recalculated. After checking reliability, factor analyses were conducted for each variable.

Ten-dimensions were found after the factor analyses of Critical Success Factors (CSFs) Scale and this finding is exactly consistent with the literature review results. Same approach is repeated for Project Management Performance (PMP) Scale and six-dimensions were found. The results were consistent with Bryde's (2003) findings. And finally, as a result of factor analyses of project success criteria in Project Implementation Profile, two-dimensions were found.

As mentioned a couple of times before, there is no consensus on project success criteria and no standard how to measure project success (Uluocak, 2014; Culleri, 2009). Based on these facts, it is hard to talk about clear and complete success, thus we preferred to use the term perceived success instead.

In order to check this subjective understanding of project success, a final question was added to 12 questions of project success criteria in Project Implementation Profile. While 12 of these questions had absolute answers, the final one had a subjective answer. From all answers, "Agree" and "Strongly Agree" were considered as positive while all other replies were accepted as negative answers. Since research model and hypotheses are developed on existing theories, the average success, which is calculated as the average of first 12 questions, was used as the perceived project performance in our study.

In terms of project success, it was seen that respondents generally found their projects as successful with 90% according to the answer of 13th question. In parallel to this result, the average success ratio of twelve success criteria was calculated as 80%. Even though the perceived project success ratio was high; the results show that the iron triangle which includes budget, schedule and quality criteria had the lowest success percentages among twelve success criteria.

According to the results, only 60% of the projects comply with the budget limit, 62% of the projects completed in targeted schedules and 70% of the projects meet quality specifications. In terms of iron triangle, the highest project success ratio belonged to quality while the lowest belonged to budget.

Even though iron triangle success ratios were seemed low in Turkish fintech sector, these results were parallel to world average. According to PMI's Pulse of the Profession 2020 Report, the highest project success ratio belonged to meeting business goals and calculated as 69%, in parallel to our study. Based on the highly competitive landscape of fintech sector, creating high quality products and meeting business intent is generally more important than complying with budget and timeline.

Although success ratios related to project development processes were lower; ratios concerning project outcomes touching clients were quite high. The average success ratio related to project outcomes and their effects was very close to the subjective success perception (90%) and this shows that project team members were aware of benefits generated by their projects in Turkish fintech sector.

According to our study results, primarily, the study has showed that predetermining critical success factors will affect the perceived project performance in a positive way. In terms of the relationship between critical success factors and perceived project performance, as a result of the additional study, it is found that three critical success factors were critical importance; project mission, technical tasks and project schedule.

Defining a clear project mission was found as the most important factor for higher project performance. Project mission covers clarifying the purpose of the project and making it understandable for the whole project team, setting pre-defined goals and defining possible directions. It shows us that making the aim of the project understandable for all team members, creating a team spirit believing the importance and future benefits of the project are highly critical to increase project performance.

The second important critical success factor was found as technical tasks in our study. Technical tasks include activities related to technology selection, high availability ensurance and proper support. In detail, this factor includes skilled and competent project teams, well-managed detailed tasks, appropriate technology selection and giving support when needed. It shows us that choosing the right technological infrastructure supporting the project, recruiting technically equipped project team members and raising awareness about the importance of the project were critically important for project performance improvement in Turkish fintech sector.

The third significant critical success factor was found as project schedule in our study. Project schedule includes activities related to the planning phase and emphasized the critical role of project managers. In detail, this factor encompasses having a detailed planning including key personnel needs and their availability, business requirements, milestones, budget details and emergency plans to be activated in case of increased risk. It shows us that planning phase including personnel assignment, timeline creation, milestone selection, budgetary planning and risk scenario implementing were also critical for higher project performance.

According to our study results, secondarily, the study has showed that project management performance will affect the perceived project performance in a positive way. As a result of the additional study, it is found that three factors related to project management performance were critical importance; project management partnerships and resources, project management lifecycle management processes and project management staff.

Establishing strong partnerships and assigning correct resources was found as the most significant factor for higher project performance. This factor includes activities related to open and two-way communication between all of the project stakeholders. In detail, as projects need to find solutions to increasingly complex problems; assigning experienced resources to right places, involving all of the project stakeholders in the execution stage, collecting individual contribution of them and meeting around a common point is extremely important. It shows us that creating collective intelligence rather than individual talents and skills, maintaining real-time communication constantly during the execution process and processing information flows centrally are indispensable for comprehensive and permanent solutions.

The second significant project management performance factor was found as project management lifecycle management processes in our study. This factor highlights implementing a well-defined life-cycle model together with appropriate procedures and updating them according to changing situations. Having a life-cycle model facilitates the understanding of procedures, milestones, project language and therefore common project culture within the organization. Life-cycle model plays a critical role in bringing stakeholders to the same plane by preventing misunderstandings and as a result of this supporting the maturation of the project culture. All of these operational aspects show us

that operational excellence in project management environment positively affect project performance.

The third important project management performance factor was found as project management staff in our study. This factor covers activities providing project-related training to project team members in order to increase capabilities. In the information age, where brain power and creative ideas are the most valuable assets, it is inevitable that project-related investment in people will make a positive contribution to the project performance. At the same time, it is important to have a defined process to manage staff performances in a transparent. Personnel performances should be evaluated according to the project-related objectives and the quality of the project outputs.

According to our study results, thirdly, the study has showed that project duration will moderate the relationship between project management performance and overall project performance. Based on the answers coming from respondents, most of the projects completed in time frames comprising of 3-6 months (89 people) and 6 months-1 year (79 people). Moreover, the average project duration in Turkey fintech sector is calculated as 9 months. Related to our study results, it is seen that when project duration increases overall project performance decreases which means project duration negatively affects project performance.

## **7.2. Implications for Management**

With the dizzying speed of change and maturing communication infrastructure, in the past years, we witnessed many innovations that opened our horizons in the information age. But the next decade opens up a world full of more complex and interdisciplinary problems that require rapid adaptation to sudden changes.

In such a world, organizations need to question regularly whether they are doing the right job rather than doing the job right, and to analyze their local and international rivals with all their moves in order to be permanent. For this reason, in accordance with the nature of the business, not only the way of doing business; it becomes important to redesign strategies, technologies and processes in a flexible manner and leave them to the management of competent personnel.

While redesigning the way of doing business, the necessity of being nimble comes to the forefront of organizations that take quick action by taking the risk of making mistakes and reposition themselves for the future in case of error. In order for these institutions to deliver products/services in shorter and frequent intervals, they also need to transform their strategy-oriented technology infrastructures and processes. In an increasingly digitalized world order, IT strategies appear as an integral part of the corporate strategy plans. In terms of realizing these strategies and providing value to stakeholders, it becomes crucial to start new projects based on detailed analyzes, to activate them in order of criticality and to monitor them from the customer perspective.

At a time of extraordinary change, organizations should give proper value to project management and accept it as a strategic competency for driving change. Project management should assist executives rebuilding their organizations to make agile and creative as well as prioritizing building a culture that is receptive to change. With the projects being an element of competitive advantage, managers should not be limited to their titles and need to break down silos between functional areas of organizations to lead multidisciplinary teams of people. Since even disruptive technologies are only as smart as the people behind them, recruiting talented staff, assigning each of them a training calendar for continuous improvement and creating opportunity for them to compete and collaborate on an equal basis will be the key to success. With so much change, executives are increasingly turning to project leaders to help them turn ideas into reality. To achieve success, organizations will need even more empowered project leaders with the skills and attitude to take the lead on change.

As in all other sectors, IT related projects play a key role in the implementation of corporate strategies in the finance sector. Even though the importance and therefore increasing investment in IT projects are growing dramatically, according to iron triangle, it is seen that most of these projects seems too far from meeting expectations. Based on this, this study aims to present managers what is understood from overall project performance, which factors are critical for higher success and which factors of project management performance are effective on success.

In terms of project performance, one of the meaningful findings of this study is that success criteria related to project outcomes touching clients were more significant than success criteria related to project development processes. Parallel to this finding, it is seen

that project planning targets including budget, schedule and quality criteria had the lowest success percentages among twelve success criteria.

The reason behind this could be seen in the nature of digitalization and continuous change. In the highly competitive landscape of fintech sector, meeting business needs based on the higher strategy and creating sustainable products/services are more crucial than complying with budget, quality and schedule targets. Designing products that will directly benefited and actively used by intended users are more important than anything. Since this situation will create customer loyalty in the medium or long term, it will provide much more revenue than any possible losses related to project planning targets.

Another reason for this could be explained by change requests occurring after project planning phase have completed. Since important projects in fintech sector includes a couple of stakeholders from different departments and lasts for 9 months on average, it is normal for project stakeholders to revise and even articulate their requests from scratch based on the market conditions and competitor moves. And every change in the initial scope causes shifts in the pre-determined budget, quality and schedule targets. As a consequence, with the coordination of the project manager, it is critical to decide and record which of these change requests are beneficial and which are not. By means of this, projects will be considered in an integrated fashion in which change and risk management will be achieved together.

Based on the market pressure and strategic objectives, most of the team members need to work simultaneously on different projects. And as an inevitable consequence of this, they have to concede unrealistic project planning targets because of the time pressure coming from higher management. As can be seen in this study, such external influences cause team members to think that they are producing a solution that does not reach the ideal result or not increasing performance. These interventions cause morale and motivation of the team to decrease as also observed in this study. In order to prevent these kind of undesirable consequences, project managers need to lend an ear to each team member, balance the workload among them and if needed resist business pressure going beyond the limit.

As a brief summary, in order to reach higher project performance, managements should attach importance also to project development processes, emphasize change and risk management, actively listen to team members and balance workload among them for maximum efficiency.

In terms of critical success factors, this study indicates that three critical success factors were critical importance: project mission, technical tasks and project schedule.

In this study, the most important critical success factor for a successful project in Turkish fintech sector was found as project mission. Based on this finding, managements should concentrate on how they articulate the aim of the project in order to be understood as requested by whole team members. Since team members are the ones who will carry out the project and reveal possible future benefits, making them enthusiastic about the success of these project and convincing them to positive consequences of their studies are highly critical. But, since projects consist of personnel from different organizational divisions having different priorities, most of the time it is difficult to create a common team spirit. While the project is accepted as a strategic advantage by a specific oranzizational division, other divisions could see it just an another ordinary process. At this point, managers should be aware of the fact that it's their responsibility to take a number of necessary actions to bring different organizational divisions together, create a team spirit and common motivation. From initiation to planning and execution stages, all parties should communicate with each other in order to match business needs and technical necessities as well as defining possible directions.

Technical tasks was found as the second important critical success factor for higher project performance in Turkish fintech sector. Since there are so many alternative solutions all of which having different pros and cons for defined needs, it is quite important to choose the right technology. In parallel with the rapid flow of life, the importance of having sustainable infrastructure has increased with the removal of the tolerance to interruptions. However, as much as the infrastructure itself, the personnel who will set up, configure, manage and intervene when necessary, having specific technical knowledge is also significant. It is a possible fact that projects managed with the right infrastructure and qualified technical personnel cause less risks and problems in the production environment. Therefore, managements should choose appropriate technological infrastructure, recruit competent personnel, train them properly and allocate related tasks in order to increase project success.

The third and the last critical success factor for higher project performance in Turkish fintech sector was found as project schedule. This result shows us the critical importance of detailed project planning including both clarifying business requirements, ensuring

personnel availability and arranging cost details as well as emergency plans against risky situations. In today's world, although most projects are asked to start as soon as possible and the outputs to be delivered quickly, it is a very critical finding in terms of showing the contribution of correct planning instead of starting projects immediately. Thus, it is management's responsibility to convey and convince the stakeholders of the importance of planning by keeping them waiting until a detailed project plan is prepared.

In terms of project management performance, this study indicates that three factors were critical importance: project management partnerships and resources, project management lifecycle management processes and project management staff.

In this study, the most critical project management performance factor for a successful project in Turkish fintech sector was found as project management partnerships and resources. Since most of the projects are now involve more than one stakeholders from various organizational divisions; proper expression of details, clear understanding by all parties and establishing strong partnerships are highly critical. In other words, it is emphasized that open and two-way communication is an indispensable factor affecting the project performance. Based on this, managements should lend an ear to individual voices but create collective intelligence around a common point and keep value-added communication from the initiation to the closure of project.

The second project management performance factor for higher project performance in Turkish fintech sector was found as project management lifecycle management processes. It shows that operational aspects of the project is also critical in order to create a common project language and therefore project culture. Creating a complete and detailed lifecycle management processes is an inevitable necessity but not enough in today's world. Since the way of doing business is prone to continuous change, all of these processes together with related procedures should be checked and updated when necessary. Thus, it is management's responsibility to implement a well-defined life-cycle model having appropriate procedures, bring stakeholders to the same plane and practice operational excellence.

The third and the last project management performance factor for higher project performance in Turkish fintech sector was found as project management staff. In today's world where access to information and technology is extremely simple, the most significant

factor that makes a difference is the human resources who can package it in an accurate way and integrate into the customers' lives. Since human factor is the most important detail of the whole process, having competent personnel in the project team and supporting them via continuous training will also facilitate achieving other factors. When you have talented people in the team, project mission might be understood better, project plan could be prepared in detail, risks can be foreseen and closure can be happened in a safer manner. In the light of the research findings, managements should recruit talented staff, provide them project-related training and assess their performances according to project outputs and project-related objectives.

Another meaningful finding of this study is the linkage between project duration and project performance that shows as the project duration increases, the project performance decreases. Based on a number of situations, when the project duration increases, main purpose of the project or team members might change, motivation of team members could decrease, new requirements may emerge and other new projects may gain urgency. In order to prevent these possible negative effects, managers should be aware of the fact that project plans should be kept as short as possible. Where this is not possible because of the complexity of projects, agile development, iterative planning and quick delivery in shorter durations should be practiced. Another fact that causes projects take long is that project team members need to work simultaneously for a number of projects. This causes team members to lose their focus, experience stress and stay in dilemma. In order to prevent these negative effects, managers should ensure team members to concentrate on only one or at most two projects at a specific time as much as possible.

### **7.3. Limitations of the Study**

The first limitation of the study is the sample size. Even though the survey was based on voluntary participation, the number of participants is quite enough for conducting statistical analysis. However, in order to achieve more generalizable results in such a large sector, the study should be repeated with more responses.

Second limitation of the study is that findings are only related to the context of fintech sector and operations in Turkey. In order to see whether there are any culture bounded concepts in terms of project success understanding, the study may be repeated in fintech

sectors of other geographical locations. From another point of view, in order to compare the results among service sectors in Turkey, the related study might be repeated in telecommunications, health care and other service industries.

The third and the last limitation of the study is that respondents were mainly composed of project team members, project managers and technical/administrative managers. On the other hand, project sponsors who represent senior management of organizations only has a percentage of 6,7 % weight. Based on this finding, it is clearly understood that results are reflecting the opinions of project team members and middle managers working actively on projects, but not senior managers.

#### **7.4. Suggestions for Future Research**

Based on the limitations, future research may focus on a larger sample size that could give chance to generalize the results. Furthermore, since this study is conducted to shed light in fintech sector of Turkey, the same study might be repeated on other service sectors especially telecommunications and health care to compare with fintech sector. Since fintech sector institutes only a limited portion of workforce in service sector, this type of study, which includes a comparison between fintech and other service industries, would create more valuable and stunning results.

Considering that project success perception could change depending on the culture, the same study may also be extended to various geographical locations having different cultures. This may provide a solution to the question that whether same rules apply to all cultures or not. Due to time constraints, cross-sectional methods were applied in this study. However, the change in the project success perception across time should also be tracked. Therefore, a longitudinal design would be beneficial by surveying same personnel at different times.

As an another suggestion, instead of using PIP and PMPA, the scales implemented for each variable could be changed by future researchers. Other variables including organization type, organization size, project team size etc. might also be used as moderators or mediators in order to better explain hypothesized relationship.

## 8. REFERENCES

- Abylova, V. & Salykova, L. N. (2019). Critical Success Factors in Project Management: A Comprehensive Review. *Project Management Development - Practice & Perspectives*, 254-262.
- Adzmi, R. M. & Hassan, Z. (2018). A Theoretical Framework of Critical Success Factors on Information Technology Project Management during Project Planning. *International Journal of Engineering and Technology* 7(4), 650-655
- Alfi, S. J. (2002). A Study of the Relationship between Project Managers' Tenure, Education, Training, Experience and Project Manager Success. A dissertation presented to the Faculty of the Graduate School of Education and Psychology Pepperdine University.
- Atkinson, R. (1999). Project Management: Cost, Time and Quality, Two Best Guesses and a Phenomenon, Its Time to Accept other Success Criteria. *International Journal of Project Management* 17(6), 337-342
- Baccarni, D. (1999). The Logical Framework Method for Defining Project Success. *Project Management Journal*, 30(4), 25-32.
- Badewi, A. (2016). The Impact of Project Management and Benefits Management Practices on Project Success: Towards Developing a Project Benefits Governance Framework. *International Journal of Project Management* 34(4), 761-778.
- Beath, C. (1991). Supporting the Information Technology Champion. *MIS Quarterly*, 15(3), 355-373.
- Benaroch, M., Jeffery, M., Kauffman, R. J. & Shah, S. (2007). Option-Based Risk Management: A Field Study of Sequential Information Technology Investment Decisions. *Journal of Management Information Systems* 24(2).
- Bhardwaj, M. & Rana, A. (2016). Key Software Metrics and its Impact on each other for Software Development Projects. *International Journal of Electrical and Computer Engineering* 6(1), 242-248.
- Bhardwaj, M., Rana, A. & Sharma, N. K. (2019). How Software Size Influence Productivity and Project Duration. *International Journal of Electrical and Computer Engineering* 9(3).
- Bryde, D. J. (1997). Underpinning Modern Project Management with TQM Principles. *The TQM Magazine* 9(3), 231-238.
- Bryde, D. J. (2003). Modelling Project Management Performance. *International Journal of Quality and Reliability Management* 20(2), 229-254.
- Bryde, D. J. (2008). Perceptions of the Impact of Project Sponsorship Practices on Project Success. *International Journal of Project Management* 26(8), 800-809.
- Bumblauskas, D., Nold, H., Bumblauskas, P. (2017). Big Data Analytics: Transforming Data to Action. *Business Process Management Journal* 23(3), 703-720.

- Carlson, K. D. & Herdman, A. O. (2012). Understanding the Impact of Convergent Validity on Research Results, *Organizational Research Methods*, 15(1), 17–32.
- Cleland, D. I. & Ireland, L. R. (2006). *Project Management: Strategic Design and Implementation*, McGraw-Hill Publishing, 5th Edition
- Chan, A. P. C., Chan, D. W. M., Ho, K. S. K. (2003). Partnering in Construction: Critical Study of Problems for Implementation. *Journal of Management in Engineering* 19(3), 126–135.
- Cho, K., Hong, T. & Hyun, C. (2009). Effect of Project Characteristics on Project Performance in Construction Projects based on Structural Equation Model. *Expert Systems with Applications* 36(7), 10461-10470.
- Crawford, J. K. & Pennypacker, J. S. (2002). Put an End to Project Mismanagement. 73-78.
- Culler, E. W. (2009). The Degree of Relationship between Critical Success Factors and Information Technology Project Performance. University of Phoenix.
- Davies, A. & Brady, T. (2016). Explicating the Dynamics of Project Capabilities. *International Journal of Project Management*. 34 (2), 314–327.
- Deniz, O. (2010). Determinants of Organizational Commitment: The Case of Information Technology Department Employees in Banks Operating in Turkey. A dissertation presented to the Institute of Social Sciences and Yeditepe University.
- De Wit, A. (1988). Measurement of project success. *International Journal of Project Management*. 6 (3), 164-170.
- Din, S., Abd-Hamid, Z., Bryde, D .J. (2011). ISO 9000 Certification and Construction Project Performance: The Malaysian Experience. *International Journal of Project Management* 29(8), 1044–1056.
- Dvir, D., Sadeh, A. & Malach-Pines, A. (2006). Projects and Project Managers: The Relationship between Project Managers' Personality, Project Types and Project Success. *Project Management Journal* 37(5), 36-48.
- El-Saboni, M., Aouad, G. & Sabouni, A. (2009). Relation between Criteria of Construction Project Success and Philosophy. 9th International Postgraduate Research Conference.
- Fan, D. (2010). Analysis of Critical Success Factors in IT Project Management. 2nd International Conference on Industrial and Information Systems.
- Ferreira, S. A., Neto, J. V., Batista, H. M. (2019). Critical Success Factors on Project and Process Management in Competitive Strategy Implementation. *Brazilian Journal of Operations & Production Management* 16, 605-616.
- Fichman, R. G., Keil, M. & Tiwana, A. (2005). Beyond Valuation: “Options Thinking” in IT Project Management. *California Management Review* 47(2), 74-96

- Fortune J. & White, D. (2006). Framing of Project Critical Success Factors by a Systems Model. *International Journal of Project Management* 24, 53–65.
- Fossum, K. R., Binder, J. C., Madsen, T. K., Aarseth, W. & Andersen, B. (2020). Success Factors in Global Project Management. *International Journal of Managing Projects in Business* 13(1), 128-152.
- Frame, J. D. (2003). *Managing Projects in Organizations: How to Make the Best Use of Time, Techniques and People* 3rd ed, San Francisco: Jossey-Bass.
- Garoushi, V., Tarhan, A., Phafl, D., Coşkunçay, A. & Demirörs, O. (2018). Correlation of critical Success Factors with Success of Software Projects: An Empirical Investigation. *Software Quality Journal* 27, 429-493.
- Gefen, D., Geen, G. & Carmel, E. (2016). How Project Description Length and Expected Duration Affect Bidding and Project Success in Crowdsourcing Software Development. *Journal of Systems and Software* 116, 75-84.
- Gewanlal, C. & Bekker, M. (2015). Project Manager Attributes Influencing Project Success in the South African Construction Industry. *Acta Structilia* 22(1).
- Heerkens, G. R. (2002). *Project Management (The briefcase book)*. New York, NY: McGraw-Hill.
- Hyvari, I. (2006). Success of Projects in Different Organizational Conditions. *Project Management Journal*, 37(4), 31-41.
- Ika, L.A. (2009). Project Success as a Topic in Project Management Journals. *Project Management Journal* 40 (4), 6–19.
- Jones, B. (2007). Factors Affecting the Full and Successful Implementation of New Technology Supporting National Security: Analysis of the Implementation of the Single Mobility System. *Dissertation Abstracts International*, 68(09).
- Joslin, R. & Müller, R. (2016). The relationship between project governance and project success. *International Journal of Project Management* 34, 613-626.
- Jugdev, K. & Müller, R. (2005). A Retrospective Look at our Evolving Understanding of Project Success. *Project Management Journal* 36(4), 19-31.
- Junguo, T. (2003). The Concept of Project Management. *Computer in the World Network of Process*.
- Junior, S. D. S. & Luciano, E. M. (2010). Proposed Strategic Map from the Perspective of Critical Factors for Project Management Maturity. *Management and Projects Magazine Brazil* 1(1), 26-47.
- Kaiser, H. F. (1974). An Index of Factorial Simplicity. *Psychometrika*, 39, 31-36.
- Keil, M., Rai, A. & Liu, S. (2013). How User Risk and Requirements Risk Moderate the Effects of Formal and Informal Control on the Process Performance of IT Projects. *European Journal of Information Systems* 22(6), 650–672.

- Kerzner, H. (2003). Strategic Planning for a Project Office. *Project Management Journal* 34(2), 13–25.
- Kerzner, H. (2006). Project Management, A Systems Approach to Planning, Scheduling, and Controlling 9<sup>th</sup> ed, Hoboken, NJ: John-Wiley & Sons.
- Kerzner, H. (2010). Project Management Best Practices 2<sup>nd</sup> ed, Hoboken, NJ: John-Wiley & Sons.
- Lipovetsky, S., Tishler, A., Dvir, D. Shenhar, A. (1997). The Relative Importance of Project Success Dimensions. *R&D Management* 27(2).
- Martin, N. L., Pearson, J. M. & Furumo, K. A. (2007). Is Project Management: Size, Practices and the Project Management Office. *Journal of Computer Information Systems* 47, 52–60
- Mir, F. A. & Pinnington, A. H. (2014). Exploring the Value of Project Management: Linking Project Management Performance and Project Success. *International Journal of Project Management* 32, 202–217.
- Morris, P. W. G. & Hugh, G. H. (1986). Preconditions of Success and Failure in Major Projects Templeton College, *The Oxford Centre for Management Studies*, Kinnington Oxford, Technical Paper No:3.
- Munns, A. K. & Bjeirmi, B. F. (1996). The Role of Project Management in Achieving Project Success. *International Journal of Project Management*, 14(2), 81-87.
- Murch, R. (2001). Project Management: Best practices for IT professionals 1<sup>st</sup> ed, Saddle River, NJ: Prentice Hall.
- Murphy D. C., Baker, B. N. & Fisher D. (1974). Determinants of Project Success. National Aeronautics and Space Administration.
- Müller, R. & Turner, R. (2007). The Influence of Project Managers on Project Success Criteria and Project Success by Type of Project. *European Management Journal* 25(4), 298–309.
- Müller, R. & Jugdev, K. (2012). Critical Success Factors in Projects. *International Journal of Managing Projects in Business*, 5(4), 757-775.
- Neely, A., Kennerly, M., Adams, C. (2007). Performance Measurement Frameworks: A Review in: Cambridge University Press, 143–162.
- Packendorf, J. (1995). Inquiring into the Temporary Organization: New Directions for Project Management, *Scandinavian Journal of Management*, 11(4), 319-33.
- Pareliya, M. (2019). Implementing Agile Project Management (Scrum) in Real Estate Projects. 8th International Scientific Conference on Project Management in the Baltic Countries, 143-155.

- Pinto, J. K. & Mantel, S. J. (1990). The Causes of Project Failure. *IEEE Transactions on Engineering Management* 37(4), 269-276.
- Pinto, J. K. & Slevin, D. P. (1987). Critical Factors in Successful Project Implementation. *IEEE Transactions on Engineering Management*, EM-34.
- Pinto, J. K. & Slevin, D. P. (1988). Project Success: Definitions and Measurement Techniques. *Project Management Journal*, 19(1), 67–72.
- Priambodo, A., Handayani, P. W. & Pinem, A. A. (2019). Success Factor for IT Project Implementation in Banking Industry: A Case Study. 3rd International Conference on Informatics and Computational Sciences
- Proabhakar, G.P. (2008). Projects and Their Management: A Literature Review. *International Journal of Business and Management*, 3.
- Putnam, L. & Myers, W. “Five Core Metrics-The Intelligence behind Successful Software Management,” New York: Dorset House Publishing Company, 2002.
- Radujkovic, M. & Sjekavica, M. (2017). Project Management Success Factors. *Procedia Engineering* 196, 607 – 615.
- Rankovic, M., Ilic, M., Stojcic, M. & Kastratovic, E. (2019). Critical Success Factors in IT Project Management. Case study on IT Banking Front-end IT System Project in Serbia. Journal of Economic Development, *Environment and People* 8(4)
- Rasnacis, A. & Berzisa, S. (2016). Method for Adaptation and Implementation of Agile Project Management Methodology. *Procedia Computer Science*, 104, 43–50.
- Sanchez, O. P., Terlizzi, M. A. & Moraes H. R. O. C. (2017). Cost and Time Project Management Success Factors for Information Systems Development Projects. *International Journal of Project Management* 35(8), 1608-1626.
- Shenhar, A. J., Dvir, D., Levy, O. & Maltz, A. C. (2001). Project Success: A Multidimensional Strategic Concept. *Long Range Planning* 34(6), 699-725.
- Shenhar, A. J., Dvir, D., Milosevic, D., Mulenburg, J., Patanakul, P., Reilly, et al. (2005). Toward a NASA-specific Project Management Framework. *Engineering Management Journal*, 17(4), 8-14.
- Shenhar, A. J. & Dvir, D. (2007). Project Management Research – The Challenge and Opportunity. *Project Management Journal*, 38(2), 93-99.
- Slevin, D. P., & Pinto, J. K. (1986). The Project Implementation Profile: New Tool for Project Managers. *Project Management Journal*, 17(4), 57-71.
- Sumner, M. (1999). Critical Success Factors in Enterprise Wide Information Management Systems Projects. *Americas Conference on Information Systems Proceedings*, 83.
- Tam, C., Moura, E. J. C., Oliveira, T. & Varajao, J. (2020). The Factors Influencing the Success of On-going Agile Software Development Projects. *International Journal of Project Management* 38(3), 165-176.

- Taylor, H. Artman, E. & Woelfer, J. P. (2012). Information Technology Project Risk Management: Bridging the Gap between Research and Practice. *Journal of Information Technology* 27(1), 17-34.
- Terlizzi, M. A., Albertin, A. L. & Moraes, A. R. O. C. (2017). IT Benefits Management in Financial Institutions: Practices and Barriers. *International Journal of Project Management*, 35(5), 763-782.
- Thomas, G. & Fernandez, W. (2008). Success in IT projects: A Matter of definition. *International Journal of Project Management* 26(7), 733-742.
- Turner, J. R. (1999) *The Handbook of Project-Based Management: Improving the Processes for Achieving Strategic Objectives*, 2nd ed, London: McGraw-Hill.
- Turner, J. R., Huemann, M., Anbari, F. & Bredillet, C. (2010). *Perspectives on Projects*, Routledge, Milton Park.
- Uluocak, B. (2014). Project Success Perception and Critical Success Factors Affecting Project Performance: The Case of Turkish Information Technology Sector. A dissertation presented to the Institute of Social Sciences and Yeditepe University.
- Varajao, J., Magalhaes, L., Freitas, L. Ribeiro, P. & Ramos, J. (2018). Implementing Success Management in an IT project. *Procedia Computer Science* 138, 891–898.
- Walker, D. & Shen, Y. (2002). Project Understanding, Planning, Flexibility of Management Action and Construction Time Performance: Two Australian Case Studies, *Construction Management Economy*, 20(1), 31-33.
- Wallace, L., Keil, M. & Rai, A. (2004). How Software Project Risk Affects Project Performance: An Investigation of the Dimensions of Risk and an Exploratory Model. *Decision Sciences* 35(2), 289-321.
- Wateridge, J. (1998). How Can IS/IT Projects be Measured for Success? *International Journal of Project Management*, 16, 59-63.
- Westerveld, E. (2003). The Project Excellence Model: Linking Success Criteria and Critical Success Factors. *International Journal of Project Management* 21(6), 411-418.
- Zwikael, O. & Unger-Avram, E. (2010). HRM in Project Groups: The Effect of Project Duration on Team Development Effectiveness. *International Journal of Project Management*, 28, 413–421.

## **9. APPENDICES**

### **Appendix A. Survey in English**

#### **Cover Letter and Guide**

Dear participant,

A PhD thesis is being written at Yeditepe University, Institute of Social Sciences, Strategy and Management PhD Program, on the topic of “Understanding the Perceived Influence of Critical Success Factors and Project Management Performance on Perceived Overall Project Performance: The Case of Turkish FinTech Sector” under the supervision of faculty member Orçun Türegün.

Our goal with this study is to determine which criteria are predominantly considered in evaluating fintech projects as successful/unsuccessful in Turkey and to determine the role of project managers' managerial performance in the success/failure of projects.

For this purpose, you are expected to answer the questionnaire considering a completed fintech project you last took part in. The results of the survey will be evaluated collectively for the purpose of analyzing the statistical relations and will only be used for academic purposes and do not contain any company or individual information/analysis.

In terms of its contribution to the academic literature, it is important to share your real opinions with the questionnaire, which consists of compulsory questions and will take at most 10 minutes. Thank you in advance for your time and valuable contributions.

Regards,

Görkem EYNÜR

## Part 1 - Demographic & Project Information

### 1. Age

- 20 and below
- 21-30
- 31-40
- 41-50
- 51-60
- 61 and over

### 2. Sex

- Female
- Male

### 3. Educational Status

- a. High School / College
- b. Undergraduate
- c. Graduate
- d. PhD

### 4. Total Tenure

- a. Less than 1 year
- b. 1 - 5 years
- c. 5 - 10 years
- d. 10 - 15 years
- e. 15 - 20 years
- f. More than 20 years

### 5. Role in the Project

- a. Project Team Member
- b. Technical/Administrative Manager
- c. Project Manager
- d. Project Sponsor

### 6. Main Activity of the Company

- a. Bank
- b. Insurance
- c. Other

### 7. Size of the Company (Number of Employees in the Company)

- a. 500 ve below
  - b. 501 - 1.000
  - c. 1.001 - 5.000
  - d. 5.001 - 10.000
  - e. 10.000 and over
8. Size of the Project Team (Approximate Number of People Working on the Project)
- a. 10 and below
  - b. 11 - 20
  - c. 21 - 30
  - d. 31 - 40
  - e. 41 - 50
  - f. 51 - 100
  - g. 101 and over
9. The Method used in the Project Management
- a. Waterfall
  - b. Agile
10. Project Duration
- a. Shorter than 3 months
  - b. 3 - 6 months
  - c. 6 months - 1 year
  - d. 1 - 3 years
  - e. Longer than 3 years

## **Part 2 – Project Critical Success Factors**

The questions on this page will attempt to measure the relative contribution of the relevant factors in the fintech project you are considering on the outcome and performance of the project. Please indicate to what extent you agree with the statements below by checking the relevant option. (1-Strongly Disagree, 2- Disagree, 3-Neutral, 4-Agree, 5- Strongly Agree)

### **A. Project Mission**

- 11. The goals of the project are in line with the general goals of the organization.
- 12. The basic goals of the project are made clear to the project team.
- 13. The results of the project will benefit the parent organization.
- 14. I am enthusiastic about the chances for success of this project.

15. I am aware of and can identify the beneficial consequences to the organization of success of this project.

**B. Management Support**

16. Upper management is responsive to our requests for additional resources, if the need arises.
17. Upper management shares responsibility with the project team for ensuring the project's success.
18. I agree with upper management on the degree of my authority and responsibility for the project.
19. Upper management will support me in a crisis.
20. Upper management has granted us the necessary authority and will support our decisions concerning the project.

**C. Project Schedule/Plan**

21. We know which activities contain slack time or slack resources which can be utilized in other areas during emergencies.
22. There is a detailed plan (including time schedules, milestones, and manpower requirements) for the completion of the project.
23. There is a detailed budget for the project.
24. Key personnel needs (who, when) are specified in the project plan.
25. There are contingency plans in case the project is off schedule or off budget.

**D. Client Consultation**

26. The clients were given the opportunity to provide input early in the project development stage.
27. The clients (intended users) are kept informed of the project's progress.
28. The value of the project has been discussed with the eventual clients.
29. The limitations of the project have been discussed with the clients (what the project is not designed to do).
30. The clients were told whether or not their input was assimilated into the project plan.

**E. Project Team**

31. Project team personnel understand their role on the project team.
32. There is sufficient manpower to complete the project.
33. The personnel on the project team understand how their performance will be evaluated.

- 34. Job descriptions for team members have been written and distributed and are understood.
- 35. Adequate technical and/or managerial training (and time for training) is available for members of the project team.

#### **F. Technical Tasks**

- 36. Specific project tasks are well managed.
- 37. The project engineers and other technical people are competent.
- 38. The technology that is being used to support the project works well.
- 39. The appropriate technology (equipment, training programs, etc.) has been selected for the project success.
- 40. The people implementing this project understand it.

#### **G. Client Acceptance**

- 41. There is adequate documentation of the project to permit easy use by the clients (instructions, etc.).
- 42. Potential clients have been contacted about the usefulness of the project.
- 43. An adequate presentation of the project has been developed for the clients.
- 44. Clients know how to contact when problems or questions arise.
- 45. Adequate advanced preparation has been done to determine how best to “sell” the project to clients.

#### **H. Monitoring and Feedback**

- 46. All important aspects of the project are monitored, including measures that will provide a complete picture of the project’s progress (adherence to budget and schedule, manpower and equipment utilization, team morale, etc.).
- 47. Regular meetings to monitor project progress and improve the feedback to the project team are conducted.
- 48. Actual progress is regularly compared with the project schedule.
- 49. The results of the project reviews are regularly shared with all projects personnel who have impact upon budget and schedule.
- 50. When the budget or schedule requires revision, input is solicited from the project team.

#### **I. Communication**

- 51. The results (decisions made, information received and needed, etc.) of planning meetings are published and distributed to applicable personnel.

- 52. Individuals/groups supplying input have received feedback on the acceptance or rejection of their input.
- 53. When the budget or schedule is revised, the changes and the reasons for the changes are communicated to all members of the project team.
- 54. The reason for the changes to existing policies/procedures have been explained to members of the project team, other groups affected by the changes, and upper management.
- 55. All groups affected by the project know how to make problems known to the project team.

#### **J. Troubleshooting**

- 56. The project leader is not hesitant to enlist the aid of personnel not involved in the project in the event of problems.
- 57. "Brain storming" sessions are held to determine where problems are most likely to occur.
- 58. In case of project difficulties, project team members know exactly where to go for assistance.
- 59. I am confident that problems that arise can be solved completely.
- 60. Immediate action is taken when problems come to the project team's attention.

### **Part 3 - Project Management Performance**

The questions on this page will attempt to measure the relative contribution of the project management performance on the project outcome and performance in the fintech project you are evaluating. Please indicate to what extent you agree with the statements below by checking the relevant option. (1-Strongly Disagree, 2- Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree)

#### **A. Project Management Leadership and Culture**

- 61. The projects are a vehicle for tackling business-led change within the organisation.
- 62. The benefits of project management are being promoted within the organisation.
- 63. Assistance is received in identifying the appropriate persons to manage projects.
- 64. Features of "project culture" are developed in the organisation. (For example, project-oriented meetings are held, a common project language exists).
- 65. The project environment within projects hinders the development of a project culture.

66. The project leadership has more focus on "hard" projects at the expense of "soft" projects.

### **B. Project Management Staff**

67. Formal project-related training is provided to increase capabilities of the project team members.
68. There is a process for evaluating performance of staff against project-related objectives.

### **C. Project Management Policy and Strategy**

69. Awareness of project management is raised by selling the benefits of project management.
70. Project management is successful when it is developed as a formal practice within the organisation.
71. Obstacles to project management specific change programmes are recognised and overcome with a positive effect on the organisation.

Note: Examples of project management specific change programmes include

- a. Redefining of jobs.
- b. Organisation-wide project management methods.
- c. Organisation-wide training in project management.
- d. Quality management system accreditation.
- e. Reduction in management layers.
- f. Total quality management.
- g. Policy of recognition for project-related work.
- h. Quality circles.
- i. Policy of employee involvement in decision making.
- j. Policy of recognition for developing skills in project-related work.
- k. Employee empowerment policy.
- l. Change in company ownership.
- m. Business process reengineering

### **D. Project Management Partnerships and Resources**

72. Open two-way partnership with customers exists.
73. Open two-way partnership with suppliers exists.
74. The project stakeholders are formally involved in the project execution.

### **E. Project Management Lifecycle Management Processes**

Note: In many organisations life cycle models are implemented with standardised critical business processes to manage each stage of the project lifecycle (e.g. initiation stage, definition stage, implementation stage). Existence of these models facilitates common understanding of procedures, common milestones, common language and therefore common project culture within the organisation.

- 75. A model of critical business processes was used throughout the project life cycle. (For explanation please see the note above).
- 76. Role of life cycle models is recognised in developing features of a project culture.
- 77. Documented procedures exist covering all stages of the project life cycle, including pre & post implementation stages.
- 78. Procedures are updated & benchmarked in response to changing requirements.

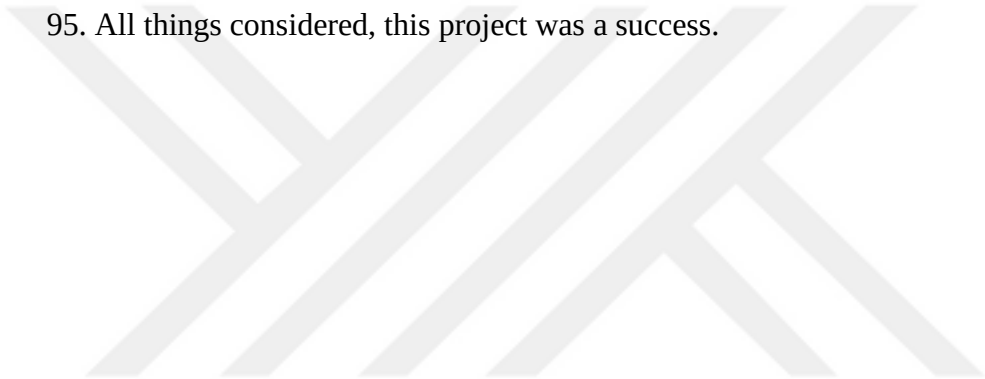
### **F. Project Management Key Performance Indicators (KPIs)**

- 79. Methods are developed in the organisation to manage the important Project Management KPIs.
- 80. Methods for managing project objectives are linked to the delivery of project benefits post-implementation.
- 81. There is a procedure for measuring stakeholder perceptions.
- 82. Methods are developed against a wide range of KPIs, in particular those relating to increase in organisational capability, such as learning and continuous improvement.

## **Part 4 - Overall Project Performance**

The questions on this page are for understanding the overall project performance of the fintech project you are evaluating. Please indicate to what extent you agree with the statements below by checking the relevant option. (1-Strongly Disagree, 2- Disagree, 3- Neutral, 4-Agree, 5- Strongly Agree)

- 83. This project has come in on schedule.
- 84. This project has come in on budget.
- 85. The project that has been developed works.
- 86. The project will be/is used by its intended clients.
- 87. This project has/will directly benefit the intended users: either through increasing efficiency or employee effectiveness.

88. Given the problem for which it was developed, this project seems to do the best job of solving the problem, i.e., it was the best choice among the set of alternatives.
  89. Important clients, directly affected by this project, will make use of it.
  90. I am/was satisfied with the process by which this project is being/was completed.
  91. We are confident that non-technical start-up problems will be minimal, because the project will be readily accepted by its intended users.
  92. Use of this project has/will directly lead to improve or more effective decision making or performance for the clients.
  93. This project will have a positive impact on those who make use of it.
  94. The results of this project represent a definite improvement in performance over the way clients used to perform these activities.
  95. All things considered, this project was a success.
- 

## Appendix B. Survey in Turkish

### Ön Yazı ve Kılavuz

Değerli katılımcı,

Yeditepe Üniversitesi, Sosyal Bilimler Enstitüsü, Strateji ve Yönetim Doktora Programı'nda “Türkiye FinTek Sektöründe Kritik Başarı Faktörlerinin ve Proje Yönetim Performansının Algılanan Proje Performansına Etkisi” başlıklı tez çalışmasını doktora öğretim üyesi Sn. Orçun Türegün danışmanlığında sürdürmekteyim.

Bu çalışma ile amacımız Türkiye FinTek Sektöründe projelerin başarılı/başarısız olarak değerlendirilmesinde hangi kriterlerin ağırlıklı olarak göz önüne alındığının belirlenmesi ve proje yöneticilerinin yönetsel performansının projelerin başarılı/başarısız olmasında oynadığı rolün tespit edilmesidir.

Bu amaçla anketimizi, en son görev aldığınız tamamlanmış bir BT projesini düşünerek cevaplamanız beklenmektedir. Anket sonuçları istatistiksel ilişkilerin analiz edilmesi amacıyla toplu olarak değerlendirilecek ve yalnızca akademik açıdan kullanılacak olup, şirket ya da kişi özelinde bir bilgi/analiz içermemektedir.

Akademik literatüre katkısı açısından, tamamı zorunlu sorulardan oluşan ve en fazla 10 dakikanızı alacak anket ile gerçek görüşlerinizi paylaşmanız önemli olup, ayıracağınız zaman ve değerli katkılarınız için şimdiden teşekkür ederim.

Saygılarımızla,

Görkem EYNÜR

## **Bölüm 1 - Demografik Bilgiler & Proje Bilgileri**

### **1. Yaşınız**

- 20 ve altı
- 21-30
- 31-40
- 41-50
- 51-60
- 61 ve üstü

### **2. Cinsiyetiniz**

- Kadın
- Erkek

### **3. Eğitim Durumunuz**

- Lise / Yüksekokul
- Lisans
- Yüksek Lisans
- Doktora

### **4. Toplam İş Tecrübeniz**

- 1 yıldan az
- 1 - 5 yıl
- 5 - 10 yıl
- 10 - 15 yıl
- 15 - 20 yıl
- 20 yıldan fazla

### **5. Projedeki Rolünüz**

- Proje Ekip Üyesi
- Teknik/İdari Yönetici
- Proje Yöneticisi
- Proje Sponsoru

### **6. Şirketinizin Ana Faaliyet Konusu**

- Banka
- Sigorta
- Diğer

7. Şirketinizin Büyüklüğü (Şirkette Çalışan Kişi Sayısı)

- 500 ve altı
- 501 - 1.000
- 1.001 - 5.000
- 5.001 - 10.000
- 10.000 ve üzeri

8. Proje Takımınızın Büyüklüğü (Projede Çalışan Yaklaşık Kişi Sayısı)

- 10 ve altı
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 100
- 101 ve üzeri

9. Projenizin Yönetiminde Kullanılan Yöntem

- Waterfall (Şelale)
- Agile (Çevik)

10. Projenizin Tamamlanma Süresi

- 3 aydan kısa
- 3 - 6 ay
- 6 ay - 1 yıl
- 1 - 3 yıl
- 3 yıldan uzun

## Bölüm 2 - Proje Kritik Başarı Faktörleri

Bu sayfadaki sorular, değerlendirmekte olduğunuz fintek projesindeki ilgili faktörlerin, projenin sonucu ve performansı üzerindeki göreceli katkısını ölçmeye çalışacaktır. Lütfen aşağıdaki ifadelere ne derece katıldığınızı karşılardaki ilgili seçeneği işaretleyerek belirtiniz. (1-Kesinlikle Katılmıyorum, 2-Katılmıyorum, 3-Kararsızım, 4-Katılıyorum, 5-Kesinlikle Katılıyorum)

### A. Projenin Amacı

11. Projenin hedefleri şirketin genel hedefleriyle uyumludur.

12. Projenin ana hedefleri proje takımına net olarak anlatılmıştır.
13. Projenin sonuçları şirkete fayda sağlayacaktır.
14. Projenin sonuçlarının başarılı olacağı konusunda hevesliyim.
15. Projenin başarısının şirkete yararlı etkilerini ayırt ve fark edebiliyorum.

#### **B. Üst Yönetim Desteği**

16. İhtiyaç olduğu takdirde üst yönetim ek kaynak sağlanması konusundaki talepleri dikkate almıştır.
17. Üst yönetim, projenin başarısının sağlanması konusunda, proje takımı ile sorumluluğu paylaşır.
18. Proje ile ilgili sorumluluğum ve otoritem üzerine üst yönetim ile hem fikirim.
19. Bir kriz anında üst yönetim beni destekler.
20. Üst yönetim bize gerekli otoriteyi vermiş olup, proje ile ilgili kararlarımızda destek olur.

#### **C. Proje Zaman Planı**

21. Acil ihtiyaçlarda yararlanmak üzere hangi işlerin daha rahat planlandığını ve hangi kaynakların daha müsait olduğunu biliyoruz.
22. Projenin tamamlanması için gerekli detay planlama (zaman planlaması, kilometre taşları, işgücü ihtiyaçları) bulunmaktadır.
23. Proje için detaylı bir bütçe bulunmaktadır.
24. Kilit personel ihtiyaçları (isim ve zaman) proje planında belirtilmektedir.
25. Projenin zaman ya da bütçeyi aşma riskinin artması durumunda devreye girecek acil durum planlaması bulunmaktadır.

#### **D. Müşteriye Danışma**

26. Projenin başında, geliştirme fazında, müşterilerin görüşlerini iletebilmeleri için elverişli ortam sağlanmıştır.
27. Müşteriler projenin ilerleyişinden düzenli bilgilendirilmişlerdir.
28. Projenin yararları ve değeri müşteriler ile tartışılmıştır.
29. Projenin limitleri (proje kapsamında alınmayan çalışmalar) müşteriler ile tartışılmıştır.
30. Müşterilere görüşlerinin proje planına dahil edilip/edilmedikleri konusunda bilgi verilmiştir.

#### **E. Proje Üyeleri**

31. Proje takımı projedeki rollerini anlamıştır.
32. Projenin tamamlanması için gerekli iş gücü kaynağı bulunmaktadır.

- 33. Proje takımı performanslarının nasıl değerlendirileceğini bilmektedir.
- 34. Proje takımının iş tanımları yazılmış, duyurulmuş ve anlaşılmıştır.
- 35. Proje takımı için gerekmesi halinde teknik ya da yönetsel eğitime zaman ve kaynak ayrılmıştır.

#### **F. Teknik İşler**

- 36. Projeye özel teknik işler iyi yönetilmiştir.
- 37. Projedeki teknik personelin iş bilgisi yeterlidir.
- 38. Kullanılmakta olan teknoloji projeyi desteklemektedir.
- 39. Proje başarısı için doğru teknoloji (araçlar, eğitim programları vb.) seçilmiştir.
- 40. Projede çalışan personel projeyi anlamaktadır.

#### **G. Müşteri Kabulü/Onayı**

- 41. Projenin müşteriler tarafından kullanımı için gerekli eğitim/bilgilendirme dokümantasyonu mevcuttur.
- 42. Potansiyel müşteriler ile projenin yararları üzerine görüşülmüştür.
- 43. Müşterileri bilgilendirmek için proje sunumu hazırlanmıştır.
- 44. Herhangi bir problem ya da soru durumunda müşteriler kime başvuracaklarını bilmektedir.
- 45. Projenin müşterilerce benimsenmesi (projenin müşterilere “satılması”) amacıyla müşterilere proje sunumu yapılmıştır.

#### **H. İzleme ve Geri Bildirim**

- 46. Projenin ilerleyişi ile ilgili önemli konular (zaman planı, bütçe durumu, işgücü kullanımı, takım morali) izlenmiştir.
- 47. Proje takımı ile düzenli toplanılarak durum değerlendirmesi ve karşılıklı geri bildirim yapılmıştır.
- 48. Fiili ilerleme ile proje planı düzenli olarak karşılaştırılmıştır.
- 49. Proje durum gözden geçirme ve analizleri, bütçe ve zaman planına etkisi olan tüm proje takımı ile paylaşılmıştır.
- 50. Bütçe ve zaman planının revizyonu/güncellenmesi gerektiğinde proje ekibinden geri bildirim alınmıştır.

#### **I. İletişim**

- 51. Planlama toplantısı sonuçları (verilen kararlar, alınan ve gerekli bilgiler vb.) ilgili personele yayınlanmıştır.
- 52. Görüş bildiren kişi ya da gruplara, görüşlerinin kabul ya da reddedildiğine dair bilgi verilmiştir.

53. Bütçe ya da zaman planı güncellendiğinde, değişiklikler ve bunların nedenleri tüm proje ekibine iletilmiştir.
54. Mevcut politika ve prosedürlerde olan değişiklikler ve sebepleri, bunlardan etkilenen tüm proje personeline, etkilenen diğer paydaşlara ve üst yönetime açıklanmıştır.
55. Projeden etkilenen tüm paydaşlar, problemlerin proje ekibine nasıl ileteceğini bilmektedir.

#### **J. Risk Yönetimi/Problem Çözümü**

56. Proje yöneticisi/lideri, problem anında, gerektiğinde projeye dahil olmayan personelden de yardım almak konusunda kararsızlık yaşamamıştır.
57. En çok nerelerde problem yaşandığının ortaya çıkarılması için “beyin fırtınası” toplantıları düzenlenmiştir.
58. Proje ile ilgili güçlüklerle karşılaşıldığında proje ekibi yardım almak üzere nereye başvuracağını bilmektedir.
59. Ortaya çıkacak problemlerin tamamen çözülebileceğinden emindim.
60. Herhangi bir problem ortaya çıktığında proje ekibi hemen aksiyon almıştır.

### **Bölüm 3 - Proje Yönetim Performansı**

Bu sayfadaki sorular, değerlendirmekte olduğunuz fintek projesindeki proje Yönetim performansının, projenin sonucu ve performansı üzerindeki görece katkısını ölçmeye çalışacaktır. Lütfen aşağıdaki ifadelere ne derece katıldığınızı karşılardaki ilgili seçeneği işaretleyerek belirtiniz. (1-Kesinlikle Katılmıyorum, 2-Katılmıyorum, 3-Kararsızım, 4-Katılıyorum, 5-Kesinlikle Katılıyorum)

#### **A. Proje Yönetimi Liderliği ve Kültürü**

61. Projeler işletme içinde iş-kaynaklı değişimi başarmak için birer araçtır.
62. İşletme içinde proje yönetiminin faydaları teşvik edilmektedir.
63. Projeleri yönetecek uygun kişilerin belirlenmesi konusunda yardım alınmaktadır.
64. İşletme içinde “proje kültürü” özellikleri gelişmiştir. (Örneğin, proje odaklı toplantılar yapılmaktadır, ortak bir proje dili vardır).
65. Projelerin içinde bulunan proje ortamı, proje kültürünün gelişmesini engellemektedir.
66. Projenin liderliğini üstlenenler, “soyut çıktılar olan” projelerden ziyade “somut çıktılar olan” projelere odaklanmaktadır.

### **B. Proje Yönetimi Personeli**

67. Proje ekibi üyelerinin yeteneklerini artırmak için proje ile ilgili resmi eğitim verilmektedir.
68. Personel performansının proje ile ilgili hedeflere göre değerlendirilmesi için bir süreç bulunmaktadır.

### **C. Proje Yönetimi Politika ve Stratejisi**

69. Proje yönetiminin faydaları anlatılarak proje yönetiminin farkındalığı artırılmaktadır.
70. Proje yönetimi, işletme içinde resmi bir uygulama olarak geliştirildiğinde başarılı olur.
71. Proje yönetimine özgü değişim programlarının önündeki engeller tanınıp işletme üzerinde olumlu bir etki yaratacak şekilde aşılr.

Not: Proje yönetimine özgü değişim programlarına örnekler şunları içerir:

- a.İşlerin yeniden tanımlanması
- b.İşletme çapında proje yönetimi yöntemleri
- c.İşletme çapında proje yönetimi eğitim
- d.Kalite yönetim sistemi akreditasyonu
- e.Yönetim kademelerinde azalma
- f.Toplam kalite yönetimi
- g. Proje ile ilgili çalışmalar için tanınma politikası
- h.Kalite çemberleri
- i. Karar verme sürecine çalışanların dahil edilme politikası
- j. Proje ile ilgili çalışmalarda beceri geliştirmek için tanınma politikası
- k.Çalışan yetkilendirme politikası
- l. Şirket sahipliğinde değişiklik
- m. İş sürecinin yeniden yapılandırılması

### **D. Proje Yönetimi Ortaklıkları ve Kaynakları**

72. Müşterilerle çift yönlü açık ortaklık bulunmaktadır.
73. Tedarikçilerle çift yönlü açık ortaklık bulunmaktadır.
74. Proje paydaşları, projenin yürütülmesi sürecinde resmen yer almaktadırlar.

### **E. Proje Yönetimi Yaşam Döngüsü Yönetimi Süreçleri**

Not: Birçok kuruluştta yaşam döngüsü modelleri, proje yaşam döngüsünün her aşamasını yönetmek için standartlaştırılmış kritik iş süreçleri ile birlikte uygulanmaktadır. (Örneğin, başlangıç aşaması, tanım aşaması, uygulama aşaması).

Bu modellerin varlığı; ortak prosedürlerin, kilometre taşlarının, dilin ve dolayısıyla kuruluş içindeki ortak proje kültürünün anlaşılmasını kolaylaştırır.

75. Proje yaşam döngüsü boyunca kritik iş süreçleri modeli kullanılmıştır. (Açıklama için lütfen yukarıdaki Not'a bakın).
76. Proje kültürü özelliklerinin geliştirilmesinde yaşam döngüsü modellerinin rolü kabul edilmiştir.
77. Uygulama öncesi ve sonrası aşamalar dahil, proje yaşam döngüsünün tüm aşamalarını kapsayan belgelenmiş prosedürler bulunmaktadır.
78. Prosedürler, değişen gereksinimlere uygun bir şekilde güncellenmekte ve kıyaslanmaktadır.

#### **F. Proje Yönetimi Temel Performans Göstergeleri**

79. İşletmede kritik proje yönetimi performans göstergelerini yönetmeye ilişkin yöntemler geliştirilmektedir.
80. Proje hedeflerini yönetmeye ilişkin yöntemler, projenin uygulanması sonrasında ortaya çıkan faydaların sunulması ile ilişkilidir.
81. Paydaş algılarını ölçmek için bir prosedür bulunmaktadır.
82. Özellikle öğrenme ve sürekli gelişim gibi örgütsel yetenekleri artırmak ile ilgili çok çeşitli performans göstergeleri için metotlar geliştirilmiştir.

#### **Bölüm 4 - Genel Proje Performansı**

Bu sayfadaki sorular, değerlendirmekte olduğunuz fintek projesinin genel proje performansının değerlendirilmesine yöneliktir. Lütfen aşağıdaki ifadelere ne derece katıldığınızı karşılardaki ilgili seçeneği işaretleyerek belirtiniz. (1-Kesinlikle Katılmıyorum, 2-Katılmıyorum, 3-Kararsızım, 4-Katılıyorum, 5-Kesinlikle Katılıyorum)

83. Bu proje zamanında tamamlanmıştır.
84. Bu proje bütçesinde tamamlanmıştır.
85. Geliştirilmiş olan proje çalışmaktadır.
86. Proje, hedef kitlesi tarafından kullanılmaktadır.
87. Proje, hedeflenen kullanıcılarının yararına olmuştur (verimlilik / etkinlik artışı sağlamıştır).
88. Proje, ilgili ihtiyacın / problemin çözümü yönünden en ideal çözümü sunmuştur.
89. Projeden etkilenen önemli müşteriler projeyi kullanacak / yarar görecektir.
90. Projenin geliştirilip tamamlandığı süreç beni tatmin etmiştir.

91. Proje hedef kullanıcıları tarafından hızla benimsendiği için teknik olmayan ilk uygulama problemleri minimum olmuştur.
92. Bu proje, hedef kitlenin daha iyi ve etkili karar almasını ya da performans artışı sağlamıştır.
93. Bu projenin kullananlara pozitif etkisi olmuştur.
94. Proje, onu kullananların işleri üzerinde, eskiye oranla kesinlikle pozitif iyileşme sağlamıştır.
95. Genel olarak düşünüldüğünde, proje başarılı olarak değerlendirilebilir.

