

LEADERSHIP COMPETENCY PROFILES IN COMPLEX PROJECT
MANAGEMENT ENVIRONMENT

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY
FEVZİYE YILMAZ

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
INDUSTRIAL ENGINEERING

JULY 2015

**LEADERSHIP COMPETENCY PROFILES IN COMPLEX PROJECT
MANAGEMENT ENVIRONMENT**

Submitted by **FEVZİYE YILMAZ** in partial fulfillment of the requirements for the degree of **The Degree of Master of Science in Industrial Engineering Department, Middle East Technical University** by,

Prof. Dr. Gülbin Dural Ünver _____
Dean, Graduate School of **Natural and Applied Sciences**

Prof. Dr. Murat Köksalan _____
Head of Department, **Industrial Engineering**

Prof. Dr. Canan Çilingir _____
Supervisor, **Industrial Engineering Dept., METU**

Examining Committee Members:

Prof. Dr. Meral Azizoglu _____
Industrial Engineering Dept., METU

Prof. Dr. Canan Çilingir _____
Industrial Engineering Dept., METU

Assist. Prof. Dr. Sakine Batun _____
Industrial Engineering Dept., METU

Assoc. Prof. Dr. Ferda Can Çetinkaya _____
Industrial Engineering Dept., Çankaya University

Assoc. Prof. Dr. İsmail Serdar Bakal _____
Industrial Engineering Dept., METU

Date: 28.07.2015

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.

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ABSTRACT

LEADERSHIP COMPETENCY PROFILES IN COMPLEX PROJECT MANAGEMENT ENVIRONMENT

Yılmaz, Fevziye

M.S., Department of Industrial Engineering

Supervisor: Prof. Dr. Canan Çilingir

July 2015, 155 pages

The overall ambition of this thesis is to find out required leadership competency profiles to be successful in complex project management environment. To ensure a complex project management environment, 35 projects that were executed in a company in the field of defense were analyzed based on complexity factors that are mentioned in literature. By using Analytic Hierarchy Process (AHP), the relative complexity of the projects was measured and projects were grouped as complex or not. By taking into account the project performance measures of the corresponding complex projects in weighted sum method, projects are sorted by success. Finally, a questionnaire about leadership behaviors (Yukl's Managerial Practices Survey) for these projects was applied to determine the competency profiles of the leaders to be successful in the complex projects. Expert Choice 11 and SPSS 21.0 software programs are used respectively for analysis of data collected from AHP Survey and Managerial Practices Survey. After the analysis, "vision/envisioning change" is determined as a critical behavior for complex project management.

Keywords: Project Complexity, Leadership, Managerial Practices Survey, Analytic Hierarchy Process

ÖZ

KOMPLEKS PROJE YÖNETİMİNDE LİDERLİK ÖZELLİKLERİ

Yılmaz, Fevziye

Yüksek Lisans, Endüstri Mühendisliği Bölümü

Tez Yöneticisi : Prof. Dr. Canan Çilingir

Temmuz 2015, 155 sayfa

Bu çalışmanın amacı, kompleks proje yönetiminde başarılı lider özelliklerinin belirlenmesidir. Bu amaçla, savunma sanayinde faaliyet gösteren bir firmanın projeleri incelendi. Bu projeler literatürde var olan kompleksite faktörlerine göre değerlendirildi ve Analitik Hiyerarşi Yöntemi (AHP) kullanılarak projelerin nispi kompleksiteleri hesaplandı. Projeler, kompleks ve kompleks olmayan projeler olarak iki kategoriye ayrıldı. Proje performans ölçümleri kullanılarak ağırlıklı toplam yöntemi ile bu projeler başarı durumlarına göre sıralandı. Son olarak, belirlenen başarılı kompleks projelerin yöneticilerine uygulanan liderlik anketi (Yukl tarafından geliştirilen Yönetimsel Uygulama Anketi) ile kompleks proje yönetiminde başarılı liderlik özellikleri belirlendi. Analitik Hiyerarşi Süreci ve Yönetimsel Yetenek anketlerinin uygulanması sonucunda toplanan veriler “Expert Choice 11” ve “SPSS 21.0” yazılım programları kullanılarak analiz edildi. Çalışma kapsamında yapılan analizler sonrasında, “öngörü/değişikliği öngörme” yeteneğinin kompleks proje yönetiminde önemli bir özellik olduğu sonucuna varıldı.

Anahtar Kelimeler: Proje kompleksitesi, Liderlik, Yönetimsel Uygulama Anketi, Analitik Hiyerarşi Süreci

To My Love

ACKNOWLEDGMENTS

I would like to express my deepest gratitude to my supervisor Prof. Dr. Canan Çilingir for her endless support, both in technical and moral subjects; and for her guidance and forbearance.

I am grateful to Ayhan Sunar not only for his guidance, invaluable advices and insight throughout this study, but also for his belief in me and his support. I would also like to thank to the company for supporting this study, the participants of the questionnaire for spending their time, and my other colleagues for their help and understanding throughout this study.

Sincere thanks to my family, especially my dear mother Nurten Bilgiç and my dear father Osman Bilgiç for their love and support to me. I could not have it made through the endeavor of this study without their amazing support.

Finally, I would also like to present my special thanks to my dearest husband, Bilkutay Yılmaz, for his patience, support and endless love.

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CHAPTER 1

INTRODUCTION

1.1. Objective and Content of the Study

Efficient management is the major factor to achieve success in projects. Especially today, project management techniques are considered to be extremely valuable, and being enforced in various companies by certification. However, leaders' competency profiles in projects areas important as applied project management techniques. Especially, in today's world, a large number of projects that differs in size, technical/technological aspects and etc. are executed simultaneously in the same company. To manage projects that include various interrelated parts, high uncertainty, difficulty, etc. (hereinafter this type of projects is called as complex projects and detailed definitions are given in Chapter 2) traditional project management methodologies (PMBOK, PRINCE2 vs.) are not adequate. The current methodologies are unsatisfactory since complex projects differ from simple projects in points of scale, change rate, heterogeneity and ambiguous objectives (CCPM, 2008).

To make traditional project management methodologies address these issues adequately; updating the known project management techniques may be an option. However, different from updates in methodologies, the success of the project may be related to the characteristics of the project manager. Here, the main question is whether managers of complex projects require additional skills, knowledge and experiences to operate in complex project environments in an effective manner.

In this study, firstly project management environment is defined in a company in the field of defense. (Due to confidentiality reasons, hereinafter the company is referred as "The Company") Then literature review is given about complexity and complex projects. Finally, required leadership competency level of project managers is defined to be successful in the management of complex projects.

1.2. Company Introduction and Problem Definition

1.2.1 Projects in the company

The company operates in defense industry. Main working areas are design, development, production and system integration of defense electronic systems.

In the company, approximately 40 projects are executed simultaneously. Projects in the company differ in size and technical dimensions. The projects executed by the company can be categorized as:

- Projects that include design and small amount of prototype product
- Projects that include design and high number of serial production after approval of the prototype production
- Projects that include design, production and integration of the produced products to the whole system
- Projects that include production of items that are designed and/or produced before
- Projects that include only software design with technical staff leasing
- Projects that include buying a product from a company and selling to another one without any value added
- Projects related to maintenance of items sold before.

The customers for the projects may be:

- Undersecretariat for Defense Industries (Savunma Sanayii Müsteşarlığı)
- Foreign customers
- Domestic firms

1.2.2 Project Management in the company

Projects executed in the company are mainly led by program management department/Office. One exception is about the projects that include serial production, and buy-sell projects; these are managed by production planning and control department. Also, the projects for maintenance and after warranty period of sold items are managed by integrated logistics departments.

Every project has a project manager for management of administrative and technical issues and a project technical manager for only technical issues. Project manager and project technical manager are assigned by the general manager of the company, according to experience in similar projects and, current workload. A project manager or project technical manager may be responsible for different number of projects at the same time, depending on the size or workload of a particular program.

Projects in the company are managed based on traditional project management techniques and leadership style of project manager. However, it is seen that same project management technique and same proficiency level in project management gives different outputs for different projects, since it is realized that the projects managed by the same person may be terminated with different performance levels.

The organization structure of the company can be weak, balanced or strong matrix according to prioritization/decision of the top management of the company. Therefore, the authority of the project managers on the project team and functional department depends on the projects they manage.

Finally, a personnel assigned to project team is determined by related functional department's manager, according to his/her capability, past experience, education and his/her workload. The formation of the project team is finalized before the kick-off meeting of a project.

1.2.3 Role of Project Manager in the company

Program Management Department/Office is the overall coordinating body for the preparations and conducts of projects. The Project Manager is responsible for the performance of the program in all aspects such as:

- Planning, coordinating and supervising the efforts during proposal preparation,
- Reviewing the requirements of the Request For Proposals and contracts,
 - Managing the program/project performance with respect to the following criteria; Technical (design, development, test, reliability, maintainability, testability, configuration control, documentation, logistics support, production, quality control, etc.).

- Financial (budgetary forecasting, etc.),
- Schedule (detailed schedules, deliveries, material inflow, etc.),
- Administration (contract administration, company rights, etc.) and
- Other specific (security, etc.) requirements during execution,
- Coordinating the interface with the customer during all phases.

1.2.4 Project Performance Measurement in the company

There is no well defined performance measurement technique for the projects executed in the company; however, to assume a project is successful the following items are important:

- Deliveries should be done in accordance with contractual project delivery schedule.
- Invoices should be made out and payments should be received in accordance with cash flow plans.
- Expenditures should be incurred within allocated budget.
- Complete customer satisfaction should be ensured.

1.2.5 Problem Definition

In the company, a project manager or a project technical manager is assigned depending on the experience or current workload, so there is no system to assign the right person to the right project. In the company, it is realized that the projects managed by the same person terminated with different performance levels; it means that same project management techniques and same proficiency level in project management may give different outputs for different projects. Also, it is seen that some projects have approximately same performance level, although different people are assigned as managers to them. Therefore, the company is doubtful about the probable effect of assigned project manager on performances of projects. Additionally, the company considers that some projects differ in terms of various interrelated parts, high uncertainty, and difficulty, so that some projects are terminated with different performance levels in spite of same project management.

To sum up, the company desires to achieve the answers for the following questions with the help of this study:

Is it possible to make some classifications of projects executed in the company based on their difficulty, size, and etc. to ensure more successful management?

Is there any relation between project performance and project manager's specific characteristics?

In this study, "complexity" is defined in the light of literature to answer the first question and the projects executed by the company are grouped as complex and non complex. Then, analyses are made to find out whether leadership competency profiles are different to be successful in complex environments.

1.3 Organization of the Thesis

This chapter includes the general information about the company and the problem definitions.

In chapter 2, namely the Literature Review chapter, the previous studies on complexity and leadership are reviewed. In addition to this, short definition of Analytical Hierarchy Process (AHP) and weighted sum method are given in this part with the help of literature.

Chapter 3, namely "methodology and results", consists of the methodology followed through the analysis of the problem and the results based on the statistical analyses that are reported in detail.

The discussions of findings are given in Chapter 4 in the light of literature, and finally, in Chapter 5 conclusions of the study are provided and directions for future research areas in addition to limitations in the study are discussed.

CHAPTER 2

LITERATURE REVIEW

2.1 Complexity

2.1.1. Definition of Complexity

Before going into the definition of “complexity”, it is important to mention about the roots of this word. The term complex is derived from the Latin plexus, in his paper Louma (2006) gives the meaning of the complex as bringing together, while Gersherson (2013) gives it as interwoven. This means that if something is complex, it includes elements that are difficult to separate. In practice, although common synonyms for the term complex are difficult, complicated (Whitty & Maylor, 2009), in the real world, the fair use ‘complexity’ is not a synonym for ‘complicated’ or ‘large’ (Weaver, 2007).

According to Whitty&Maylor (2009), complexity is a measure of the difficulty to achieve the desired understanding of a complex system, or it is the amount of information necessary to describe a complex system with reference to Bar-Yam (2003). This means that more information is required to describe higher complexity. Gerhenson (2013) states that in a complex system, different elements interact and outcomes are unpredictable and nonlinear. This reveals the whole is more than the sum of its parts in the case of complexity. A lot of examples can be given as complex systems such as governments, the human body (physiological), and a person (psychosocial) (Bar-Yam, 2003 &Bak, 1997).

2.1.2 Properties of Complexity

Although many papers were written about complexity in recent years, omplexity is still seen as a black box and the properties of complex systems mentioned in the literature give an indication about what it actually is. These properties are listed below:

- Complex systems involve“large number of interacting elements”(Snowden, 2007), “multiplicity (number of components)” and “causal connection (number of links between components)” (Homer-Dixon, 2000).

- Components of complex systems cannot be seen apart from each other. In other words, decomposition of complex systems into different elements is too hard. (Dombkins, 2012). This property is called interrelatedness. Nauta (2011) claims that this makes a reductionist approach of understanding a complex system a hard task.
- It is stated by Homer-Dixon (2000), if a module is subtracted from a complex system without affecting the system's behavior; less complex system is achieved. This is called the interdependence property of complexity.
- The behavior of a component of a complex system does not help to make deduction about the behavior of the overall system. This is emergency feature of complexity (Bar-Yam, 2003). In other words, the output of the complex system is different from the total sum of its components (Homer-Dixon, 2000&Nauta, 2011).
- Complex systems are indeterminate in the sense that the outcome of such a system is not always clear beforehand (Nauta, 2011); that means they have high uncertainty (Dombkins, 2012).
- The outcome of a complex system is not linear, in the sense that a system's response with respect to its input is sensitive to small changes in the input (e.g. The famous "Butterfly effect") (Nauta, 2011&Homer-Dixon, 2000).
- Complex systems are dynamic systems, this means the properties of the system change over time (Nauta, 2011); in other words complex systems are usually adaptive systems of systems (Dombkins, 2012).
- According to Homer-Dixon, 2000, complex systems are open to environments, not self-contained and it is difficult to define boundary. In reference to Dombkins (2012), complex systems have ongoing environmental and internal turbulence.
- Complex system has a history. This means that the past is integrated with the present and the future (Snowden, 2007).

2.1.3 Project Complexity

Project Management Institute defines a project as "a temporary and unique endeavor undertaken to deliver a result" (PMI, 2013). This result causes a change in the organization and this change occurs between a start and a final date. According to

Vidal et al. (2011a & 2011b), time and resources are used within a project to reveal products/services or to ensure performance/resource improvement.

Baccarini (1996) is the first person that mentions about complex dimensions of projects in the late 1990s. Project failures in terms of cost overrun and time delays occur frequently and are being investigated for a long time (Flyvbjerg et al., 2003) and the failure is often linked to a lack of basic processes (Whittaker, 1999); however, Williams (1999) declared that the inability to manage complexity has been recognized as a major factor in project failure. After, the Cynefin Framework (Marco Cynefin) developed by Snowden (2000) and it is accepted as one of the first functional applications of complexity theory to the science of project management. Additionally, project management is added to the list of disciplines related to the theory of complexity in 2006 (Whitty&Maylor, 2009) and in the same year, IPMA (IPMA, its English acronym for International Project Management Association) approved the concept of Complex Project Management. After that time, complexity is begun to be perceived as a property of the project. Cicmil et al. (2006) assert that “complexity has been recently addressed as one of the most relevant topics in project management research”.

Some authors, including Williams (1999) and Xia&Lee (2004) define projects as “complex systems that require management”, since project managers try to handle organizational factors that are not in project manager’s control in addition to technological issues. Together with the organizational and technical complexities described by Baccarini (1996), project managers have to consider a large number of parameters (e.g. environmental, social) and different stakeholders, both inside and outside the project (Chu et al. 2003, Jones&Anderson, 2005). Different factors that make projects complex can be the number of stakeholders, technical requirements, risks, etc or any combination of different factors. Concerning this issue, Vidal et al. (2011a & 2011b) state that “project complexity is the property of a project which makes it difficult to understand, foresee and keep under control its overall behavior”, while CCPM differentiates between simple (routine) projects and complex projects by “the degree of disorder, instability, emergence, nonlinearity, recursiveness, uncertainty, irregularity and randomness, including a high uncertainty about objectives” (CCPM, 2008).

Moreover, several studies have highlighted the different dimensions of the complexity of projects. Turner&Cochrane (1993), and Shenhar&Dvir (2007) refer to the technological complexity while Baccarini (1996) adds organizational complexity. Williams (2002) shares the view of Baccarini (1996), but extends it by one additional dimension; namely uncertainty. Also, Williams (2002) described the product complexity which influences project complexity to investigate aspects of project structural complexity. According to Xia and Lee (2004), complexity may be measured in the dimensions of “organizational/technical” and “structural/dynamic”. Kahane (2004) introduce social complexity to the literature, according to him talking and listening to each other are critical behaviors to solve hard problems. With the help of this dimension, “science, engineering and technology were combined with society, economy and culture” (Yingluo, 2008).Cooke-Davies &Arzymanow (2003) classify complexity dimensions as the technical dimension and the human dimension.

The TOE framework (TOE stands for Technical, Organizational, and External) was developed to structure different aspects of projects that are related to the complexity of projects (Bosch-Rekvelde et al., 2009). As defined by Baccarini (1996), technical aspects of project complexity are related to the technical contents of a project and sub-categories within the technical aspects can be listed as goals, scope, tasks, experience and risk. Organizational aspects defined by Baccarini (1996), are related to the context in which the project is executed within the organization and sub-categories within the organizational aspects can be exemplified as resources, project team, trust, risk. External (or environmental) aspects are related to the environment of the project and sub-categories within the environmental aspects are: stakeholders, location, market conditions and risk.

2.1.4 Complex Project Management

The College of Complex Project Management (CCPM) describes the management of the project as a process: “continuum: at one node is traditional project management, with its philosophy, organizational architecture, methodology, tool set and contracts all firmly based upon certainty; at the other node is complex project management,

with its philosophy, organizational architecture, methodology, tool set and contracts all firmly based upon uncertainty and complexity” (CCPM, 2008).

In his research, Williams (2005) claims that the traditional project management techniques are inadequate if they applied to complex projects. Bertelsen (2004) agrees with the same idea and he claims the main cause of the project failure is “the application of linear, ordered and mechanistic approaches to manage complex, non-linear and dynamic projects”. In fact, it has been claimed (Cicmil et al. 2006) that, although most efforts over the years have been focused on traditional project management, very little is known yet about the ‘actuality’ of projects and their management. Therefore, understanding of the complex project management is important to tackle with project failures.

CCPM (2008) defines complex project management as “an emerging natural extension of traditional PM to create a specialist profession...” Domkins (2012) elaborates this definition as “the lifecycle delivery of emergent strategic outcomes through projects which are usually adaptive system of systems; have high uncertainty in scope definition; are distributed; have ongoing environmental and internal turbulence; are implemented through wave planning; and are unable to be decomposed to elements with clearly defined boundaries”.

Complex Project Management not only delivers organizations the capability to manage highly complex projects, but also delivers a strategic capability to organizations and governments in the management of their ongoing businesses. Complex project management has evolved over time as a result of the identification and recognition of issues exhibiting complex characteristics that traditional project management methodologies had not had the capability to adequately address. Maylor et al. (2013) claims that “understanding and actively managing project complexity has the potential to identify better processes, staffing, and training practices, thereby reducing unnecessary costs, frustrations, and failures”.

2.1.5 Project Complexity Measurement

To support modern project management, project complexity needs to be understood and measured better (Vidal et al., 2011a&2011b). This complexity should be analyzed based on the size and uncertainty on the projects (Kähkönen, 2008), the

interrelationship and interdependence between the parts of the project (Baccarini, 1996), the difficulty depending on skill requirements, the pace and urgency of results (Payne, 1995) and interaction with the context (Geraldi&Adlbrecht, 2006). However, because of the subjectivity of the issue, complexity assessment is difficult (Maylor et al., 2013). For any given piece of work, complexity level can be interpreted differently because of his/her knowledge or lack of knowledge. While a manager may think how challenging a particular project is, another manager might see the same project as straightforward due to lack of understanding.

In the literature, some authors touch briefly on the subject of complexity measurement; however, most of them have tried to deal with a specific part of the complex project management issues like scheduling and sequencing problems (Vidal et al.,2011a &2011b). The other groups have tried developing some complexity measures through the use of model of project structure as a graph. The most popular method is defined by Kaiman (1974) as “The Coefficient of Network Complexity (CNC)” by applying PERT and precedence Networks. In his article, the description of CNC is given as a measure of the degree of interrelationship (or complexity) of the network itself through the following simple equations:

For PERT Networks → $CNC = \text{Activities} / \text{Events}$.

For Precedence Networks → $CNC = (\text{Preceding Work Items}) / (\text{Work Items})$.

After this paper, many articles are written about this issue and network complexity measurement has developed, cyclomatic number is an example of this development. The cyclomatic number defined byTemperley (1981)gives thenumber of independent cycles in a graph. This technique is generally used in software engineering to find out program complexity by measuring and controlling the number of paths through a program. However, these methods are criticized on the issue that some graphs and networks sharing the same CNC but are very different considering their easiness to be managed, also these methods ignore interdependencies (Vidal et al.,2011a &2011b).

When the subject comes to the project complexity as a whole (not network complexity only), Shafiei-Monfared & Jenab (2010) offers a graph-based model to

measure the relative complexity of design projects. Relative complexity of design projects is achieved through the use of managerial and technical graphs and complexity design structure matrix in this work. Additionally, Vidal et al. (2011a & 2011b) propose a multi-criteria approach to project complexity evaluation, through the use of the Analytic Hierarchy Process. Complexity factors and subfactors are determined to find out the most complex project. In his paper, simultaneously 30 multi criteria methods are evaluated and finally, Analytic Hierarchy Process (AHP) is selected the most favorable methodology for project complexity measurement.

2.2 Leadership

2.2.1 Definition of Leadership

In the literature, leadership is a widely used term with multiple definitions and there are thousands of books on leadership, articles and blog posts. Northouse (2004) defines leadership as a process of social influence in a group setting that results in achievement of goals or objectives; while Maloş (2012) give exactly the same definition with different words in his article. Osborne (2008) and O’Leary (2000) enlarge the definition by saying “leadership is the ability to inspire and encourage others to overcome challenges, accept continuous change, and achieve goals; it is the capacity to build strong, effective teams, it is the power to communicate assertively and it is the ability to influence others”. Therefore, in literature definitions of leaderships include some common elements. In their paper, Dansereau et al (2013) define these basic elements as a leader, a follower (group member), and their relational interactions.

When it comes to leader characteristics, Banutu-Gomez and Banutu-Gomez (2007) point out that “great leaders create a vision for an organization, share the vision with the followers and build a shared vision, craft a path to achieve the vision, and guide their organizations into new directions”.

2.2.2 Leadership Theories

After the introduction of the concept of leadership into literature, the growing variety of theories comes up to our word. The first known theory is the Great Man Theory about the leadership. The theory claims that leaders are different from their followers. All leaders are extraordinary people and leaders are born not made.

Similar in some ways to "Great Man" theories, trait theories claims that inherit qualities and traits of people make them better in leadership (Maloş, 2012); however, with the rise of behavioral science, these theories have fallen out of favor and following theories are mentioned in the literature based on behavioral science:

- **Contingency Theories**

Contingency theories are based on the main idea that “no leadership style is best in all situations” (Maloş, 2012). There are so many variables that might determine which particular style of leadership is best suited for the situation such as followers’ understanding and organizational conditions.

- **Situational Theories**

Situational theories propose that leaders choose the best action according to situational variables; it requires a rational understanding of the situation and an appropriate response (Graeff, 1997). Different type of leadership may be more appropriate in a certain situation. Maloş (2012) exemplifies this as, if group members are skilled experts, a democratic style would be more effective in the management.

- **Behavioral Theories**

According to behavioral theories of leadership is not innate talent and it is possible to acquire this ability later. Maloş (2012) explains this theory as any person can become a great leader after teaching and observation.

- **Participative (Democratic) Leadership Theories**

Participative leadership theories claim leaders should take group members’ opinions into account. Maloş (2012) defines this type of leaders as “they encourage participation and contributions from group members and help group members feel more relevant and committed to the decision-making process.”

- **Management Theories (Transactional Theories)**

Management theories, also known as transactional theories, focus on the role of supervision, organization and group performance. These theories are based leadership on a system of rewards and punishments. When employees are successful, they are rewarded; when they fail, they are punished. Howell and Avolio (1993) describe this relationship as “both the leader and follower reach an agreement concerning what the follower will receive for achieving the negotiated level of

performance. The rewards are then provided consistent with satisfactory completion of the agreement”.

- **Relationship Theories (Transformational Theories)**

The relationship theories, also known as transformational theories, emphasize the connections formed between leaders and followers. As Bass (1985) and Dansereau et al (2013) point out, transformational leaders inspire and motivate followers to transform themselves. Although these leaders seem to be focused only on the performance of group members, another aim of this type of leaders is teach group members to fulfill their potential.

- **Laissez-faire Leadership Theories**

Laissez-faire leadership is based upon “the avoidance or absence of leadership” (Judge and Piccolo, 2004). Under this theory, it is believed that group members find their own ways to pursue their work-related goals and even have a chance to create their own goals in the absence of leadership. However, laissez-faire leaders are still responsible for the actions and progress of group members, although leaders ensure very little guidance when they are working or making decision. (Dansereau et al, 2013).

- **Servant Leadership Theories**

As the name of the leadership suggests this type of leaders puts members' needs, aspirations, and interests before their own needs, aspirations, and interests (Greenleaf, 1977).

- **Charismatic Leadership Theories**

As House and Baetz (1979) point out, “charismatic leaders have profound and extraordinary effects on followers”. Group members admire this type of leaders because of their specific inherent characteristic, not because of their title or position in the organization.

- **Responsible Leadership Theories**

This theory represents a concept that exists at “the intersection of two existing fields of study: social responsibility and leadership” (Waldman & Balcan, 2014).

- **Authentic Leadership Theories**

Authentic leadership incorporates transformational leadership and ethical issues (Avolio et al., 2004), or in other words, it is accepted as adding ethical leadership qualities to the established transformational leadership style.

- **Implicit Leadership Theories**

Implicit leadership theories are based upon the implicit assumptions about good leaders characteristics, behaviors, appearance, etc. (Schyns&Meindl, 2005). Therefore, implicit leadership theories try to explain the link between group member's assumption about good leadership and leader's actual behavior.(Schyns& Schilling, 2011).

2.2.3 Current Leadership Theories

After the introduction to the “complexity” into the literature, Bennis (1998) described the inevitable evolution of leadership to a more organic state and form. Agreeing with the idea, Uhl-Bien et al. (2007) defined complexity leadership theory as “complexity leadership theory requires leaders to emerge informally and interactively in the midst of complex organizational dynamics, and to respond as systems adapt to unpredictable challenges and chaotic environments”. After analysis on complex systems, this theory defines three leadership roles, namely “adaptive leadership, administrative leadership, and enabling leadership”. In this study definition of these types of leadership are made as follows:

- Adaptive leadership: “It refers to adaptive, creative, and learning actions that emerge from the interactions of complex adaptive systems”.(Uhl-Bien et al.,2007)
- Administrative leadership:“It structures tasks, engages in planning, builds vision, allocates resources to achieve goals, manages crises and conflicts, and manages organizational strategy.”(Uhl-Bien et al.,2007)
- Enabling leadership: “It works to catalyze the conditions in which adaptive leadership can thrive and to manage the entanglement between the bureaucratic (administrative leadership) and emergent (adaptive leadership) functions of the organization.”(Uhl-Bien et al.,2007)

As it can be inferred from the previous part, numerous theories and leadership styles have been defined, however a consensus is not reached. As Latham (2014) points

out, “there are still no reasonable amount of cogent and coherent theories for leaders to follow”. In the view of Latham (2014), none of the current leadership theories ensure a complete answer to the leadership challenges of the 21st century, the century of the complexity where leaders have to manage complexity and adaptive problems in complex systems. According to Wilson (1999), what is needed is “to combine multiple sources of evidence into a more comprehensive and deeper understanding of the leadership phenomenon”.

To measure leadership style in a more comprehensive way, Dulewicz & Higgs(2005) and Yukl (1994) introduced a detailed questionnaire and taxonomy. Their studies have tried to overcome the challenges of the 21st century.

Dulewicz & Higgs(2005) developed the leadership dimensions questionnaire (LDQ) which provides an indication of the leaders’ competencies measured on 15 dimensions. LDQ includes seven EQ (emotional) dimensions, five MQ (managerial) competencies, and three IQ (intellectual) competencies. Titles and short definitions of the 15 leadership dimensions appear in Table 1. It is known that the LDQ has been used various public and commercial organizations, including the Royal Navy, the Royal Air Force, DHL to measure leadership competency in an efficient manner (Geoghegan&Dulewicz,2008).

Table 1 Fifteen leadership competencies developed by Dulewicz and Higgs (2005)

Leadership Competency Category	Specific Behavior	Definition of the behavior
Intellectual (IQ)	Critical analysis & judgment	“The leader gathers relevant information from a wide range of sources, probing the facts, identifying advantages and disadvantages. Sound judgments and decisions making, awareness of the impact of any assumptions made.”
	Vision and imagination	“The leader is imaginative and innovative. He or she has a clear vision of the future and foresee the impact of changes on implementation issues and business realities.”
	Strategic perspective	“The leader is aware of the wider issues and the broader implications. He or she balances short and long-term considerations and identifies opportunities and threats.”
Managerial (MQ)	Resource Management	“The leader organizes resources and coordinates them efficiently and effectively. He or she establishes clear objectives and converts long term goals into action plans.”

Leadership Competency Category	Specific Behavior	Definition of the behavior
	Engaging communication	“The leader engages others and wins their support through communication tailored for each audience. He or she is approachable and accessible.”
	Empowering	“The leader gives direct reports autonomy and encourages them to take on challenges, to solve problems and develop their own accountability.”
	Developing	“The leader encourages others to take on ever more-demanding tasks, roles and accountabilities. He or she develops others’ competencies and invests time and effort in coaching them.”
	Achieving	“The leader shows an unwavering determination to achieve objectives and implement decisions.”
Emotional (EQ)	Self-awareness	“The leader is aware of his or her own feelings and able to recognize and control them.”
	Emotional resilience	“The leader is able to maintain consistent performance in a range of situations. He or she retains focus on a course of action or the need to obtain certain results in the face of personal challenge or criticism.”
	Motivation	“The leader has drive and energy to achieve clear results and make an impact.”
	Interpersonal sensitivity	“The leader is aware of, and takes account of, the needs and perceptions of others in arriving at decisions and proposing solutions to problems and challenges.”
	Influence	“The leader can persuade others to change a viewpoint based on the understanding of their position and the recognition of the need to listen to this perspective and provide a rationale for change.”
	Intuitiveness	“The leader arrives at clear decisions and is able to drive their implementation in the face of incomplete or ambiguous information by using both rational and ‘emotional’ perceptions.”
	Conscientiousness	“The leader displays clear commitment to a course of action in the face of challenge and matches ‘words and deeds’ in encouraging others to support the chosen direction.”

Yukl (1994) produced an integrated taxonomy to ensure comprehensive and deeper understanding on leadership. In his article (2012), Yukl specifies his primary purpose as to bring together researches about effective leadership behavior that has conducted over more than half a century. To integrate results of these researches, he develops comprehensive behavior taxonomy. The resulting taxonomy (updated by Yukl in 2012), including four broad meta-categories as leadership style and 15 specific

component behaviors, is given in Table 2. The survey developed by Yukl to evaluate these specific behaviors is called as Managerial Practices Survey (MPS).

Table 2 Hierarchical Taxonomy of Leadership Behaviors (Yukl,2012)

Leadership style	Leadership Behavior
Task-oriented	Clarifying
	Planning
	Monitoring operations
	Problem Solving
Relations-oriented	Supporting
	Developing
	Recognizing
	Empowering
Change-oriented	Advocating change
	Envisioning change
	Encouraging innovation
	Facilitating collective learning
External	Networking
	External monitoring
	Representing

Yukl’s taxonomy is important because his taxonomy gives indication about which specific behavior should be measured to measure effective leadership; also it aims to reduce uncertainty in previous leadership behavior research. According to Phelan (1998), Yukl’s taxonomy is important in the respect that a causal relationship is established between behaviors and effective leadership.

Yukl’s taxonomy included four leadership types: Task oriented, relations oriented, change oriented and externals. The four umbrella categories are composed of 15 specific behaviors. In the view of Yukl (2012), each leadership style has a different primary objective. These objectives are given as (Yukl, 2012):

- For task-oriented leadership, the primary objective is “to accomplish work in an efficient and reliable way”.

- For relations-oriented leadership, the primary objective is “to increase the quality of human resources and relations”,
- For change-oriented leadership, the primary objectives are “to increase innovation, collective learning, and adaptation to the external environment”.
- For external leadership, the primary objectives are “to acquire the necessary information and resources, and to promote and defend the interests of the team or organization”.

The definitions for specific leadership behaviors are given below (Yukl, 2012):

- **Planning:** “Leaders develops short-term plans for the work; determines how to schedule and coordinate activities to use people and resources efficiently; determines the action steps and resources needed to accomplish a project or activity.”
- **Clarifying Roles & Objectives:** “Leader clearly explains task assignments and subordinate responsibilities; sets specific goals and deadlines for important aspects of the work; explains priorities for different objectives; explains rules, policies, and standard procedures.”
- **Monitoring Operations & Performance:** “Leader checks on the progress and quality of the work, examines relevant sources of information to determine how well important tasks are being performed; and evaluates the performance of members in a systematic way.”
- **Problem Solving & Disturbance Handling:** “Leader identifies work-related problems that can disrupt operations, makes a systematic but rapid diagnosis, and takes action to resolve the problems in a decisive and confident way.”
- **Supporting:** “Leader shows concern for the needs and feelings of individuals; provides support and encouragement when there is a difficult or stressful task; and expresses confidence that a subordinate can successfully complete it.”
- **Recognizing:** “Leader praises effective performance by individuals or the team; provides recognition for member achievements and contributions to the organization, and recommends appropriate rewards for people with high performance.”
- **Developing Skills:** “Leader provides helpful feedback and coaching for a person who needs it; provides helpful career advice, and encourages subordinates to take advantage of opportunities for skill development.”

- **Empowering others:** “Leader involves subordinates in making important work-related decisions and considers their suggestions and concerns; delegates responsibility and authority to subordinates for important tasks and allows them to resolve work-related problems without prior approval.”
- **Advocating Change:** “Leader explains an emerging threat or opportunity; explains why a policy or procedure is no longer appropriate and should be changed; proposes desirable changes; takes personal risks to push for approval of essential but difficult changes.”
- **Envisioning Change:** “Leader communicates a clear, appealing vision of what could be accomplished; links the vision to member values and ideals; describes a proposed change or new initiative with enthusiasm and optimism.”
- **Encouraging Innovation:** “Leader talks about the importance of innovation and flexibility; encourages innovative thinking and new approaches for solving problems; encourages and supports efforts to develop innovative new products, services, or processes.”
- **Facilitating Collective Learning:** “Leader uses systematic procedures for learning how to improve work unit performance; helps people understand causes of work unit performance; encourages people to share new knowledge with each other.”
- **Networking:** “Leader attends meetings or events, and joins professional associations, social clubs, and social networks to build and maintain favorable relationships with peers, superiors, and outsiders who can provide useful information and assistance.”
- **External Monitoring:** “Leader analyzes information about events, trends, and changes in the external environment to identify threats, opportunities, and other implications for the work unit.”
- **Representing:** “Leader lobbies for essential funding or resources; promoting and defending the reputation of the work unit or organization; negotiating agreements and coordinating related activities with other parts of the organization or with outsiders.”

2.3 Position of our study with respect to literature

After giving information about the existing literature for complexity and leadership, now it is time to mention position of our study with respect to literature.

The aim of this thesis is to find out required leadership competency profiles to be successful in complex project management environment. To ensure a complex project management environment, projects that were executed in a company in the field of defense were analyzed based on complexity factors. By using Analytic Hierarchy Process (AHP), the relative complexity of the projects was measured and projects were grouped based on their complexity. By taking into account the project performance measures of the corresponding complex projects in weighted sum method, projects are sorted by success. Finally, a questionnaire about leadership behaviors was applied to determine the competency profiles of the leaders to be successful in the complex projects. Therefore, this study is completed in three stages, namely complexity measurement, project performance measurement and determination of leadership competency.

In the literature, there are some researches on these topics. Some of them focus only one of the topics, while some of them concentrate on two of the topics. However, as we know, there is no research/paper that focus all of them at the same time. (Table 3 sums up some of the existing literature that touches upon these topics.) Our study will fill this gap in the literature, since it is related to complexity measurement, project performance measurement and also determination of leadership competency simultaneously.

Table 3 Existing Researches/studies on complexity, project performance and leadership competency

Topics of the studies			
1.Complexity measurement	1.Project Performance measurement 2.Determination of leadership Competency	1.Complexity measurement 2.Determination of leadership Competency	1.Complexity measurement 2.Project Performance measurement 3.Determination of leadership Competency
(Vidal et al.,2011a&Vidal et al.,2011b) ¹ (Shafiei-Monfared & Jenab, 2010) ² (Maylor &Turner,2013) ³ Bosch-Rekvelde et al.,2011) ⁴	(Christenson and Walker,2004) (Crawford,2007) (Summer, Bock and Giamartino,2006) Finkelstein,2003) (Keller,2006) (Geoghegan& Dulewicz,2008)	(Thomas and Mengel,2008) (Bass,1985) (Bosch-Rekvelde et al,2009) (CCPM,2008)	(Muller and Turner,2010) ⁵

¹ In this study, Vidal et al. use AHP to measure relative complexity of the projects

² This study report presents a graph-based model to measure the relative complexity of design projects

³ In this study, The Complexity Assessment Tool (CAT) has developed to understand the level of complexity of projects with a questionnaire which includes 32 questions.

⁴ In this study, TOE framework was developed (TOE (Technical, Organizational, and Environmental) to measure the complexity.

⁵ In this study, a questionnaire was filled to the respondents to categorize their last project using the four attribute areas (application area, Complexity, Strategic importance and Contract type). Complexity in projects may be low, medium and high according to this study and level of complexity was asked to the respondents with only one question. No multi criteria decision making methodology is used to measure complexity.

2.4 Project Performance Indicators

The increasing complexity of projects makes it more likely that project activities will have uncertain project duration, more expenditure than budgeted and risks. Thus, monitoring the projects' activities and measuring the success of projects is vital in this environment. To measure project performance, project performance indicators are required. There are thousands of books and articles about project performance and important indicators that may be used to measure project performance.

According to PMI (2013), the success of the project should be measured in terms of completing the projects within the constraints of scope, time, cost, quality, resources and risk as approved between the project managers and senior management. To measure project performances, Xia and Lee (2004) use delivery time, cost, functionality and user satisfaction as performance indicators. Similarly, in their study Kendra and Taplin (2004) claims that the most important metrics to find out success of projects are project time-duration, cost-budget variances and quality.

2.5 Analytic Hierarchy Process (AHP)

Analytic Hierarchy Process (AHP) was developed by Thomas L. Saaty (Saaty, 1977), for contingency planning and allocation of scarce resources in the military. It is accepted as a structured decision making tool for organizing and analyzing complex decisions with the set of alternatives and criteria. After its introduction into the literature, it became a widely used method for solving complicated problems with multiple criteria in decision-making environments.

Saaty (1980&1990) addressed AHP as “a structured decision making method for analyzing discrete set of alternatives which are affected by multiple and conflicting criteria”. In the view of Aker (2010), AHP is “a multi-criteria decision-making method which permits the relative assessment and prioritization of alternatives”.

This method follows a hierarchical way for decomposition of the unstructured complex problem that involves generalization of components like, criteria, sub-criteria, sub-sub-criteria and so on. In this hierarchical model, there are multiple levels of criteria located under the goal, and alternatives located in the bottom level of the hierarchy. By breaking the problem into levels, the decision-maker could focus on smaller sets of decisions and the problem is broken down into easily

manageable elements. The generalized AHP hierarchical structure is shown in Figure 1.

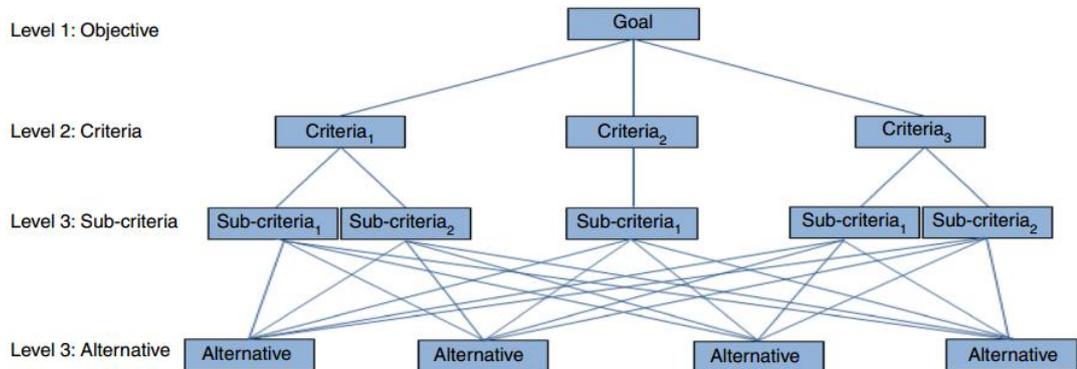


Figure 1 General hierarchy structure of AHP

AHP can be summed up in the following steps (the following information is gathered from Saaty (1980), Saaty (2008), and Mishra&Singh (2015)):

1. The problem is defined and hierarchical structure is formed, including different decision level, such as a goal, the intermediate levels (criteria and sub criteria) and lowest level (which usually is a set of the alternatives).
2. At each level of hierarchy structure, pairwise comparison is done with the help of decision maker's input given in the form of numeric values. On the pairwise comparison stage, a priority scale of absolute judgments is used, which enables to measure the relative importance of elements and represents how much more; one element dominates another with respect to a given attribute (Saaty, 2008). Saaty Scale that is used to determine the relative importance of alternatives is given in Table 4:

Table 4 Saaty Scale of Relative Importance (Saaty, 2005)

Numerical Value	Verbal Meaning of Alternative Evaluation
1	Equally preferred
2	Equally to moderately preferred
3	Moderately preferred
4	Moderately to strongly preferred
5	Strongly preferred
6	Strongly to very strongly preferred

Numerical Value	Verbal Meaning of Alternative Evaluation
7	Very strongly preferred
8	Very strongly to extremely preferred
9	Extremely preferred

Pairwise comparisons constitute in the end square matrices which are called comparison matrices, the values of which are between 1/9 and 9. If pairwise comparisons are between n elements, then the structured matrix is n -by- n reciprocal matrix (Figure 2). The diagonal elements of the matrix are equal to 1 while the other ones verify two conditions:

- $a(i,j)$ takes values from 1 to 9 based on the relative importance of the criteria. (e.g. $a(i,j)=3$ if A_i is moderately preferred to A_j .)
- $a(i,j)$ is equal to the inverse of $a(j,i)$.

$$A = \begin{bmatrix} 1 & a_{12} & \dots & a_{1n} \\ 1/a_{12} & 1 & \dots & a_{2n} \\ \cdot & & & \cdot \\ \cdot & & & \cdot \\ \cdot & & & \cdot \\ 1/a_{1n} & 1/a_{2n} & \dots & 1 \end{bmatrix}$$

Figure 2 AHP Pairwise Comparison Matrix

3. Calculation and setting up the priorities is done through relative weights of elements of the criteria, sub-criteria and alternatives. To solve the reciprocal matrix, Saaty uses the eigenvector. Individual judgments in corresponding matrix are synthesized by using eigenvalue method to find consensus priority weights of the alternatives in a certain level of the hierarchy.

Eigenvalue λ_{max} of matrix A can be calculated using the following equations:

$$AW = \lambda_{max}W$$

where W is eigenvector (a non zero vector) and λ_{max} is eigenvalue (a scalar). After normalizing the eigenvector W , the vector element of W is considered as the local weight of each decision factor approximately, denoted as:

$$W_j = (w_1, w_2, \dots, w_n)$$

4. As the latest step, controlling the consistency of the subjective evaluations is required, it helps to detect errors. To do this the ratio between Consistency

Index (CI) and Random Index (RI), called the consistency ratio (CR) is calculated:

$$CR = CI/RI$$

If CR= 0, the matrix is said to be perfectly consistent; however, it is difficult to obtain a perfectly consistent matrix from subjective judgment. If CR≤0.1, matrix is acceptable, otherwise the judgment needs to be adjusted until the matrix fulfills the consistency test. CI is obtained by:

$$CI = (\lambda_{max} - n)/(n - 1)$$

where λ_{max} is eigenvalue and n is number of criteria. Table that gives RI values for different n is given in Figure 3.

Factors (n)	1	2	3	4	5	6	7	8	9	10
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49

Source: Saaty (1980)

Figure 3 Random Index (Saaty, 1980)

For the AHP analysis and results, “Expert Choice” computer software is generally used. Expert Choice is an algorithm that automatically computes the relative importance of factors after entering collected pairwise comparisons. Also, it synthesized all pairwise comparisons to rank the alternatives overall. Expert Choice also assists the user to determine the comparisons’ consistency and it proposes to improve consistency.

2.6 Weighted Sum Method

The weighted-sum method is a widely used method for multi objective optimization. It has been used extensively not only “to provide multiple solution points by varying the weights consistently”, but also “to provide a single solution point that reflects the preferences presumably incorporated in the selection of a single set of weights” (Huangl, 2014). The method requires setting a fixed weight for each objective, then, multi objective problem is transformed into the single-objective problem. (Marler&Arora, 2010).

The method transforms multiple objectives into an aggregated scalar objective function by multiplying each objective function by a weighting factor and summing

up all contributors(Kim&Weck,2006).Therefore, in the weighted sum method the problem is reformulated as:

$$\min \sum_{i=1}^m w_i f_i(x)$$

$$\text{s.t. } x \in \Omega$$

where w_i ($i=1,\dots,m$) is a weighting vector for the j th objective function and $w_i \geq 0$, $\forall i=1,\dots,m$ and $\sum_{i=1}^m w_i = 1$.

Ideally, weights of each objective function are assigned by the decision maker based on the intrinsic knowledge of the problem. However, as different objective functions can have different magnitude, the normalization of objectives is required to get a consistent solution with the weights assigned by the decision maker. In literature, some schemas were defined as transformation methods to remove dimensions or balance magnitude differences in objective functions. The selection of transformation method depends on the properties of data and tendency of the decision maker. The best known schemes that can be used in the application of weighted sum method are given below(Jaina et al, 2005):

- $F_i^{trans} = \frac{F_i(x)}{|F_i^{max}|}$ (Van Delft and Nijkamp ratios of maximum value)
- $F_i^{trans} = \frac{F_i(x) - F_i^o}{F_i^o}$
- $F_i^{trans} = \frac{F_i(x)}{F_i^o}, F_i^o > 0$
- $F_i^{trans} = \frac{F_i(x) - F_i^o}{F_i^{max} - F_i^o}$ (Weitendorf ratios)
- $F_i^{trans} = \frac{F_i(x)}{\sum_{i=1}^m F_i(x)}$ (Total ratios)
- $F_i^{trans} = \frac{F_i(x)}{\sqrt{\sum_{i=1}^m F_i(x)^2}}$

In their article, Brauers et al (2007) argue that it is vital to use transformation technique in which each response of an alternative on an objective is compared to a denominator which is a representative for all alternatives concerning that objective. Also, in their study, Brauers et al. (2008) prove that the square root of the sum of squares of each alternative per objective in denominator is the best choice to apply multi objective decision making criteria. In this study, it is emphasized that the whole

series of objectives is not taken into account if only maximum or minimum values of the alternative is used in the selected transformation technique and the reliability of the technique can be affected negatively from the outliers. Therefore, following transformation system is used in this study because it helps to represent each alternative per objective:

$$F_i^{trans} = \frac{F_i(x)}{\sqrt{\sum_{i=1}^m F_i(x)^2}}$$

CHAPTER 3

METHODOLOGY AND THE RESULTS

The proposed method, to find the required leadership behaviors for the success of complex projects is carried out in three phases: AHP implementation for complexity measurement, weighted sum method application for project performance measurement and statistical tests on the results of MPS survey. Each phase is accomplished through a series of steps, as presented in Figure 4. These steps of the proposed method are given in detail throughout this chapter.

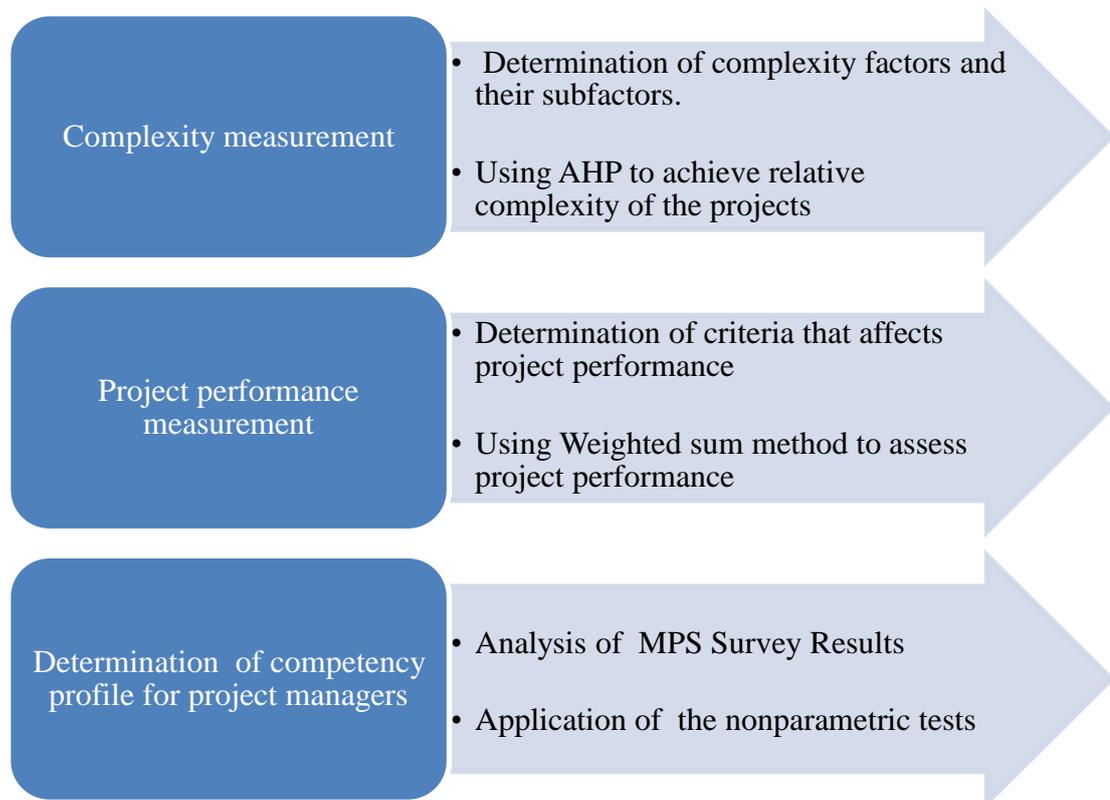


Figure 4 Stages of the method used in the study

3.1 Complexity Measurement

3.1.1 Determination of the complexity factors and their sub factors

As mentioned in Chapter 2, complexity and complex project management has been a hot topic in the literature in recent decades and many papers were written and research was done to define complexity in projects. In this study, after analyzing several literature sources, factors that contribute to project complexity are

determined. Complexity factors were listed and some factors that are irrelevant to the sector of the company are eliminated after several meetings with top managers of the company. Finally, the factors that increase complexity in projects executed by the company are determined. The complexity factors determined through the literature review and interviews are given in Table 5. (References for criteria in Table 4 are given in Appendix A):

Table 5 Complexity factors/criteria

Complexity Factors/Criteria	Complexity Factors/Criteria
Unfamiliar technology	Roles and responsibilities unclear
Technology development requirements	Dependencies with the environment
A variety of technologies used during the project	Availability of people, material and any resources due to sharing
Interdependencies among technologies	Interdependencies between sites, departments and companies
Demand of creativity	Interconnectivity and feedback loops in the task and project networks
Integration across multiple technical disciplines	Team cooperation and communication
Largeness of scope (number of components, etc.)	Managing different agendas of the people involved
Specification interdependence	Dependencies between schedules
Distributed/Virtual team	Interdependencies of objectives
Number and variety of resources	Dependencies in government policies
Number of companies/projects sharing their resources	Too much interference from the client
Number of departments involved	Cultural Differences
Managing a remote location	Dependence of one deliverable on the other
Number of objectives	High number of deliverables
Intensive learning needs	Number of activities
Number of hierarchical levels	Duration of the project
Staff quantity	Unrealistic time frames
Number of decisions to be made	Key risks not identified early
Communication between different parts of the organization	Procurement systems did not assist in managing the scope
Experience	Level of interrelations between phases
Project Team	Number and variety of stakeholders
Project team member assigned to many projects	Funding sources and processes

3.1.2 Description of Complexity Factors/Criteria

Short description of selected criteria for the complexity of the projects is given below. At this point, it is important to say that some of the complexity criteria are inherent to the projects, some of them are strictly related to organization or some of them are depend on the business field of the company.

- Unfamiliar technology: In some cases, technology exists in the market, but the company does not have any experience on it. For example, some firms in the sector may have an ability to produce a kind of production, but the company does not know anything about it except some general information. Introduction of this new technology to the company requires training of related personnel, research and, etc. Therefore, all of these efforts contribute to the complexity of the project environment.
- Technology development requirements: Some projects require technology development to ensure the right deliverables to the customer. The content of technology development can cause complexity, because of the technical capability of the project team, required infrastructure, and etc. Technology development requires much iteration before reaching expected output, and it requires close attention.
- Variety of technologies used during the project: In some cases, projects require integration of some technologies. If these technologies have not been used together until that time, integration of technical backgrounds between different groups under project team is required to achieve best output.
- The interdependencies among technologies: If the required technologies under the projects are strictly related to each other, any problem or delay in a part can affect the whole project negatively.
- Demand of creativity: In some cases, creativity is a crucial thing to execute the project successfully. For example, restricted space can be defined in a plane/helicopter for the introduction of a new capability, or a customer can request a user interface software with defined confronting requirements.
- Integration across multiple technical disciplines: Increase in the number of required technical disciplines causes an increase in learning needs for integration of the related disciplines, and increase in number of required decisions to achieve a

common solution to the problems. Therefore, integration across multiple technical disciplines increases the complexity.

- Largeness of scope (number of components, etc.): Largeness of scope means a high number of tasks the project team is expected to accomplish and a significant amount of different technical specification. It helps to make deductions about size, and complexity of the project.
- Specification interdependence: Some specifications are defined under the contracts of the project. If these specifications are interrelated, it increases the complexity in the project since specific attention is required to fulfill all of them simultaneously.
- Distributed/Virtual team: Running a project virtually causes difficulties in integration of work methods, organizational cultures and technologies between dispersed groups; therefore increases the complexity.
- Number and variety of resources: Increase in number and variety of resources can be seen a factor of complexity because of the difficulties in management and planning.
- Number of companies/projects sharing their resources: If the required resources under the projects have to be used by different projects or different companies, organizational and strategic issues arise in addition to difficulties in management and planning.
- Number of departments involved: High number of departments involved in project team means a high number of functional managers in the projects. Since the projects are executed based on a matrix organization, more functional managers cause difficulties in decision making processes.
- Managing a remote location: In some cases, the location in which project developed /executed and location in which outputs are used are strictly different from each other. To execute the project successfully, a significant number of fieldwork and meetings are required.
- Number of objectives: If the number of objectives defined by the company is high, specific planning and monitoring will be crucial on the execution stage of the projects to ensure all of them simultaneously.
- Intensive learning needs: If the company is involved in a new technological area, intense learning will be needed by the technical team to ensure successful

output, and for the administrative project team to manage the projects in the most effective manner.

- Number of hierarchical levels: Increase in number of hierarchical levels extends the time to make a decision.
- Staff quantity: Increase in the number of people in the organization and the projects bring managerial difficulties, therefore high scores in this category imply high risks of delay and causes complexity.
- Number of decisions to be made: Different decision points defined under the projects require additional works/ meetings to find the most suitable alternative after detailed examinations of all alternatives.
- Communication between different parts of the organization: If the company performs in different locations, each of which expertise in different technological requirement; the effective communication between different parts helps to increase project performance.
- Experience: If the experience of company and project team in terms of technical and managerial issues is high, then the management of the project will be easier. Otherwise, lack of experience brings complexity to the project.
- Project Team: Since completing a project successfully requires teamwork, staffing the project with the right skills is a crucial issue for the project management.
- Project team member assigned to many projects: If a project team assigned to many projects, one of the major frustrations for the project manager is about how effectively and efficiently use the team members.
- Roles and responsibilities unclear: Lack of clear roles and responsibilities result in confusion, errors and omissions to execute the project, therefore adds to complexity.
- Dependencies with the environment: Events external to the project, called project environment, often come as a surprise to the project team and are therefore seen as obstacles to progress. However, the project team must recognize the environment and be responsive to it in order to execute the project successfully. The project environment includes all the issues related to the environment, such as legal, cultural, political, and ecological factors.

- Availability of people, material and any resources due to sharing: One of the most important aspects of the project manager's role is to monitor the assignments of each resource so that he/she can effectively balance the workloads. Some resources might be over allocated, and others might be under allocated. It is important to review how efficiently the resources are being used in the project, and whether any adjustments are needed, all of the issues increase the complexity of the project.
- Interdependencies between sites, departments and companies: If the interdependencies exist between sites, departments and companies, it will be crucial to understand these dependencies in order to make the right decisions through the lifecycle of the project. However, trying to handle the entire dependencies make the project management more difficult.
- Interconnectivity and feedback loops in the task and project networks: If the result of the one task can affect another task in the project and the other part of the project is also affected by this change, a feedback loop exists in the project. This loop requires detailed planning and monitoring not to cause any delay in the project schedule, and it causes to an increase in the complexity of the corresponding project.
- Team cooperation and communication: To execute a project successfully, effective communication and team cooperation are key factors. Any troubles on these factors may cause numerous problems such as demotivation of project teams, assessing wrong information, etc.
- Managing different agendas of the people involved: The project team includes many people who have clear responsibilities for a specific part of the project and who have to communicate among themselves. Although modern tools of communication like e-mails are used commonly in the today's world, managing different agendas of the people involved in a project is a challenging issue to execute the project proper to its schedule.
- Dependencies between schedules: To achieve best results in the project, it is crucial to schedule the project by taking into account all of the dependencies, and thinking about all of the dependencies increases the complexity.
- Interdependencies of objectives: The project manager needs to set the objectives of the project and works towards meeting these objectives. If the objectives are

interdependent with each other, it is important strike a balance between the constraints, so that none of them will be compromised.

- Dependencies in government policies: The legal issues on a project can be broad and include many different levels of government. For example, the project may require specific business licenses, building permits, and etc. The hiring and management of workers from different company can be complex and time consuming issue for some projects because of some legal issues. Also, every project operates within one or more communities that reflect organizational dynamics and power struggles, these additional politic issues add complexity to the projects.
- Too much interference from the client: A project manager is often a client representative and has to determine and implement the exact needs of the client; therefore it is so crucial to make contact with the client effectively. However, if the client shows a tendency to interfere with the redundant tasks; additional efforts to manage client's interference add complexity to the project management environment.
- Cultural Differences: In complex project environment, an increased interaction between people of different countries brings about an increase in the need to deal with cultural differences. Not to cause a decline in project performance, the project team must understand the community's culture and its potential impacts on projects.
- Dependence of one deliverable on the other: If an output of a project/phase is dependent on the completion of another project's/phase's deliverables, this connection requires specific attention to manage the project successfully.
- High number of deliverables: The higher number of deliverables in a project means the greater likelihood of project failure due to crucial planning (workload, procurement and etc.)
- Number of activities: If the number of activities needed to complete the deliverables is high, planning, scheduling and managing the working teams will be critical issues for the project manager.
- Duration of the project: The long lasting projects require particular attention directed to planning, delivering the solution, selecting team members and sustaining a high-performing and high-motivated team over a long period.

Therefore, increase in project duration cause increase complexity in the project environment.

- Unrealistic time frames: Unrealistic time frames in contract negotiation are a well known fact in the business sector of defense. Many times, the customer asks for the project to be completed in a time frame which is not at all possible, and many times a project gets delayed due to rework or constant changing requirements. In any case, the project manager needs to work and employ some of the strategies to deliver projects on the original schedule baseline; this adds complexity to the project.
- Key risks not identified early: If a company is more successful in detecting risks early in the project life cycle, it is more likely to achieve best outputs. Otherwise, key risks became an important element of the project complexity.
- Procurement systems did not assist in managing the scope: The inherent complexity and risk of the project may increase with more procurement. When more items is being procured rather than supplied internally, the project is considered more complex; since procurement activities present potential risks to the project. It is also so crucial for the project schedule, if the organization's procurement team does not understand the critical nature of a supplier; it is an inevitable delay in the project schedule.
- Level of interrelations between phases: By breaking the project into different phases, the total workload of a project is divided into smaller components, thus making it easier to monitor and manage. However, if these phases are interrelated, monitoring and managing the components become more difficult and this increases the complexity of the projects.
- Number and variety of stakeholders: One of the important tasks that project managers often perform after taking over a project is communicating with all stakeholders. If the project includes many and diverse stakeholders; understanding each stakeholder's particular concerns and issues may be a complex issue.
- Funding sources and processes: In general, projects are initialized with a contract directly made between customer and the company. However, in some cases, grant agreement may be signed with some institutes/research centers that are founded to support research, technology development and innovation capabilities. These

agreements require different procedures in the execution phase of the projects. For instance, an independent project monitoring referee may be appointed to monitor and report the technical progress regularly to the institute/research center.

3.1.3 Using AHP for complexity measurement

In this part, the complexity factors that are gathered from literature and interviews are examined. The aim is to find out the relative importance of factors that contribute to the complexity of projects. Since many factors are considered and analyzed in this study, it could be regarded as multi-criteria decision-making problem. With this point of view, before deciding on the suitable method for analysis, previous studies in the literature are investigated.

As mentioned in Chapter 1, few studies are done to measure project complexity. One used method is graph-based model to measure the relative complexity of design projects offered by Shafiei-Monfared & Jenab (2010). In this study, to measure the complexity of a project, the main assumption is that there is a direct relationship between complexity and total standard man-hours spent in the design. In this work, the relative complexity of design projects is achieved using managerial and technical graphs and complexity design structure matrix. Since the complexity factors cannot be reduced to a factor such as standard man-hours in our case, this type of graph based method was not selected to compute the project complexity.

Vidal et al. (2011a, 2011b) propose a multi-criteria approach to project complexity evaluation, through the use of the Analytic Hierarchy Process. Complexity scales and subscales are defined in order to find out the most complex alternatives in the hierarchical structure.

In the light of the literature research, AHP technique is chosen as being the most suitable and useful approach since it is widely used method for solving multiple criteria decision-making problems. AHP is a multicriteria decision method that uses hierarchical structures to represent the problem and then develop rankings of alternatives based on decision maker's pairwise comparison as mentioned in the literature review chapter. This technique is used in numerous and diverse

applications due to its simplicity and ability to cope with complex decision making problems (Zakarian&Kusiak, 1999). AHP is a model that allows individuals to shape their ideas and define problems by making their own assumptions in numerical ways by using Saaty scale and the solution is driven from them. It enables users to check the consistency of the judgments and to test the sensitivity of the solution, or outcome.

AHP allows modeling the problem as a hierarchy containing goal, the alternatives for reaching the goal and the criteria for evaluations alternatives. As a complexity measurement, this method is proper to achieve the desired solution. In our case, the hierarchy can be constructed easily. The goal will be the determination of the relative complexity of projects while the alternatives are selected projects and the criteria are the factors that contribute to the complexity.

AHP uses pairwise comparisons of factors to construct ratio scales that are useful in making important decisions. As seen in the part below, there are factors that contribute to the complexity and to determine the relative importance of these factors, pairwise comparison is a good option. Since, with pairwise comparison all the factors are compared in pairs to judge which factor is a greater effect on the project complexity.

In addition, AHP technique has a specific property compared to other techniques, which is a capability of transforming empirical data into mathematical models. Badea (2014) describes that AHP converts the comparisons, which are most of the time empirical, into numeric values that are further processed and compared. To sum up, due to all of these properties, AHP is chosen as the most appropriate method for our study.

At this stage, it is important to remind that all the factors and the main factors in the AHP hierarchy are assumed to be independent. Independence of factors is important since there should not be any correlation between factors while comparing with each other in the application of AHP.

3.1.4 Classification of complexity factors

After deciding on the method of organizing and analyzing complexity factors, a hierarchical structure is generated to apply AHP. With the help of this hierarchical structure, the problem is decomposed into more easily comprehended sub problems, and each of which can be analyzed independently.

In the construction of the hierarchy of our problem, predetermined complexity factors are clustered into four main categories (main factors/ main criteria) which are technical issues, organizational issues, interdependencies, and structural issues. These main categories are defined with the help of literature and opinions of managers of the company to construct hierarchy of the problem. At the end, each complexity factor is placed under the most relevant main factors. This helps to simplify the problem and lead us to see the importance of each main factor and sub-factor easily through the application of AHP.

The corresponding classification is shown in Table 6.

Table 6 Classification of Complexity Factors

Criteria	Sub criteria
Technical Issues	Unfamiliar technology
	Technology development requirements
	Variety of technologies used during the project
	Interdependencies among technologies
	Demand of creativity
	Integration across multiple technical disciplines
	Largeness of scope (number of components, etc.)
	Specification interdependence
Organizational Issues	Distributed/Virtual team
	Number and variety of resources
	Number of companies/projects sharing their resources
	Number of departments involved
	Managing a remote location
	Number of objectives
	Intensive learning needs
	Number of hierarchical levels
	Staff quantity
	Number of decisions to be made

Criteria	Sub criteria
	Communication between different parts of the organization
	Experience
	Project Team
	Project team member assigned to many projects
	Roles and responsibilities unclear
Interdependencies	Dependencies with the environment
	Availability of people, material and any resources due to sharing
	Interdependencies between sites, departments and companies
	Interconnectivity and feedback loops in the task and project networks
	Team cooperation and communication
	Managing different agendas of the people involved
	Dependencies between schedules
	Interdependencies of objectives
	Dependencies in government policies
	Too much interference from the client
	Cultural Differences
Dependence of one deliverable on the other	
Structural Issues	High number of deliverables
	Number of activities
	Duration of the project
	Unrealistic time frames
	Key risks not identified early
	Procurement systems did not assist in managing the scope
	Level of interrelations between phases
	Number and variety of stakeholders
	Funding sources and processes

After determination of complexity main factors and sub factors, the hierarchy tree is constructed as shown in Figure 5.

GOAL
Determination of complexity of projects executed in Company X

Main Criteria	Technical Issues	Organizational Issues	Interdependencies	Structural Issues
Sub-criteria	Unfamiliar technology	Distributed/Virtual team	Dependencies with the environment	High number of deliverables
	Technology development requirements	Number and variety of resources	Availability of people, material and any resources due to sharing	Number of activities
	Variety of technologies used during the project	Number of companies/projects sharing their resources	Interdependencies between sites, departments and companies	Duration of the project
	Interdependencies among technologies	Number of departments involved	Interconnectivity and feedback loops in the task and project networks	Unrealistic time frames
	Demand of creativity	Managing a remote location	Team cooperation and communication	Key risks not identified early
	Integration across multiple technical disciplines	Number of objectives	Managing different agendas of the people involved	Procurement systems did not assist in managing the scope
	Largeness of scope (number of components, etc.)	Intensive learning needs	Dependencies between schedules	Level of interrelations between phases
	Specification interdependence	Number of hierarchical levels	Interdependencies of objectives	Number and variety of stakeholders
		Staff quantity	Dependencies in government policies	Funding sources and processes
		Number of decisions to be made	Too much interference from the client	
		Communication between different parts of the organization	Cultural Differences	
		Experience	Dependence of one deliverable on the other	
		Project Team		
		Project team member assigned to many projects		
		Roles and responsibilities unclear		

Figure 5 Hierarchy Tree of AHP

3.1.5 Preparation and Execution of AHP Survey

After construction of the hierarchy, the questionnaire form is prepared. With this questionnaire pairwise comparison between main factors and pairwise comparisons between sub-factors under each main factor are made. In the questionnaire, each comparison of two factors/subfactors gives quantitative information about which factor/sub factor is more important for project complexity. The questionnaire offers 9-point scale to determine the relative importance because of Saaty Scale.

In the application of AHP, pairwise comparisons of complexity criteria are asked to project managers in the company. 21 project managers in the company have been reached to participate in the survey. (The survey is given in Appendix B). Demographic information of projects managers that participate to the AHP survey are given in Table 7. In this table, there are information about the age and gender of participants. Also, the participants are questioned whether he/she has worked as project manager or project technical manager in the company until that time. As it can be seen from the table, only 2 of 21 project managers are female and the ages of project managers vary between 27 and 50.

Table 7 Demographic information about project managers that participate in AHP survey

Participants	Age	Gender	Technical Project Manager (TPM) or Project Manager (PM)
1	46	Male	TPM and PM
2	40	Female	TPM
3	27	Male	TPM
4	29	Male	PM
5	39	Male	TPM
6	38	Male	TPM and PM
7	35	Male	TPM
8	36	Male	TPM
9	50	Male	PM
10	37	Male	TPM
11	37	Male	PM
12	30	Male	TPM and PM
13	41	Male	TPM and PM
14	42	Male	TPM

Participants	Age	Gender	Technical Project Manager (TPM) or Project Manager (PM)
15	32	Male	PM
16	49	Male	PM
17	30	Male	PM
18	27	Female	PM
19	42	Male	TPM and PM
20	41	Male	PM
21	29	Male	PM

3.1.6 Results of AHP

- **Relative importance of factors/sub factors for project complexity**

In the application of AHP, pairwise comparisons of complexity criteria are asked to project managers in the company and 21 answers are gathered. Then the answers are entered to Expert Choice to understand the relative importance of the criteria. As mentioned in literature review part; when applying AHP, it is important to achieve consistent judgments from attendees. After collecting all pairwise comparisons, controlling the consistency of the subjective evaluations is required. If the comparisons gathered from project managers give an inconsistency ratio above 0.10, then the questions asked to the project managers again. With the help of this method, it is ensured that maximum inconsistency is 0.10 in collected results. After entering collected data into Expert choice, the relative importances of criteria that make projects of the company more complex are found out. The summary of AHP results is given in Table 8 and detailed expert choice outputs, including relative inconsistency values, are given in Appendix C:

Table 8 Relative importance of criteria for complexity measurement

Criteria/Sub criteria	Relative importance of complexity criteria/subcriteria
Technical Issues	0.261
Unfamiliar technology	0.102
Technology development requirements	0.204
Variety of technologies used during the project	0.1
Interdependencies among technologies	0.105
Demand of creativity	0.128

Criteria/Sub criteria	Relative importance of complexity criteria/subcriteria
Integration across multiple technical disciplines	0.143
Largeness of scope (number of components, etc.)	0.114
Specification interdependence	0.105
Organizational Issues	0.24
Distributed/Virtual team	0.034
Number and variety of resources	0.032
Number of companies/projects sharing their resources	0.058
Number of departments involved	0.036
Managing a remote location	0.045
Number of objectives	0.054
Intensive learning needs	0.067
Number of hierarchical levels	0.044
Staff quantity	0.038
Number of decisions to be made	0.064
Communication between different parts of the organization	0.074
Experience	0.104
Project Team	0.105
Project team member assigned to many projects	0.099
Roles and responsibilities unclear	0.144
Interdependencies	0.255
Dependencies with the environment	0.048
Availability of people, material and any resources due to sharing	0.051
Interdependencies between sites, departments and companies	0.058
Interconnectivity and feedback loops in the task and project networks	0.061
Team cooperation and communication	0.072
Managing different agendas of the people involved	0.079
Dependencies between schedules	0.073
Interdependencies of objectives	0.077
Dependencies in government policies	0.167
Too much interference from the client	0.176
Cultural Differences	0.043
Dependence of one deliverable on the other	0.094
Structural Issues	0.244
High number of deliverables	0.034
Number of activities	0.052
Duration of the project	0.061
Unrealistic time frames	0.202
Key risks not identified early	0.188
Procurement systems did not assist in managing the scope	0.132

Criteria/Sub criteria	Relative importance of complexity criteria/subcriteria
Level of interrelations between phases	0.097
Number and variety of stakeholders	0.115
Funding sources and processes	0.118

- **Relative complexity of projects**

To find out projects complexity that had been executed in the company, the top managers who know all 35 projects are questioned. In this questionnaire, 35 projects are compared pair wisely under all complexity criteria and sub criteria. In the end, ranking of projects based on complexity is obtained. The normalized complexity values of projects according to a complexity scale/index (from 0 to 1), as shown on Figure 6. (The complexity values obtained from Expert Choice are given in Appendix D).

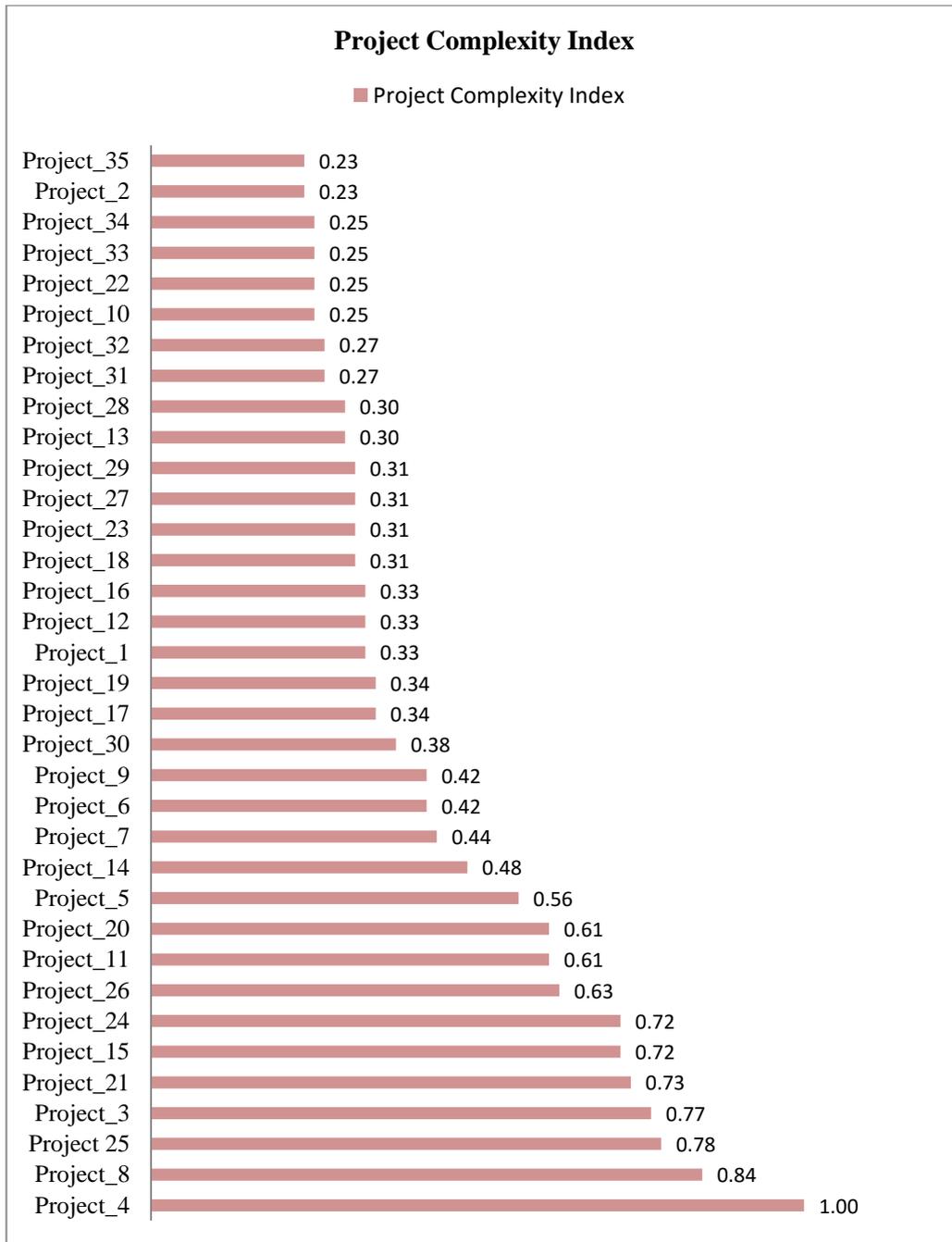


Figure 6 Relative Project Complexities

3.1.7 Classification of Projects

In this study, due to the fact that relative complexity is examined, all projects have a complexity value different than zero, however, this does not mean that all of the evaluated 35 projects are complex. To classify these projects as complex and non-complex, the normality test to the data are made under %95 confidence interval. Since the test results under Shapiro-wilkSig is smaller than 0.05, we conclude that

the data is not normally distributed. (Normality test result is given in Appendix E). Therefore, to classify the projects as complex and non-complex, the median value (0,34) is used and the projects that have complexity value greater than 0,34 are accepted as complex. This means that other projects have lower complexities, however, for the sake of simplicity, the term ‘non complex’ is used to refer to them in this study. The classification of projects is given in Table 9:

Table 9 Classification of Projects

Complex Projects (16 projects out of 35 projects)	Project_4, Project_8, Project_25, Project_3, Project_21, Project_15, Project_24, Project_26, Project_11, Project_20, Project_5, Project_14, Project_7, Project_6, Project_9, Project_30
Non-complex Projects (19 projects out of 35 projects)	Project_35, Project_2, Project_34, Project_33, Project_22, Project_10, Project_32, Project_31, Project_28, Project_13, Project_29, Project_27, Project_23, Project_18, Project_16, Project_12, Project_1, Project_19, Project_17

3.2 Project Performance Measurement

3.2.1 Determination of project performance criteria

For the determination of the project performance evaluation criteria, brainstorming meetings were conducted with participation of personnel of Programs and Project Management Division. Existing project performance evaluation criteria were reviewed and expert advices were also taken into account in the identification of the criteria. As a result of this process, 5 criteria are named for performance evaluation.

A detailed description and explanation of these criteria are given below:

- **Number of Contract Change:** Contract change may be made due to change in some technical and administrative issues, change in customer requests or etc. In general, any contract change shows a prediction error in the management of technical or administrative issues. Therefore, it affects the project’s performance negatively.
- **Number of Customer Complaint:** Customer satisfaction is one of the most vital issues for the company not only for the success of the current projects but also for the potential projects. If there is an increase in customer complaints, it means a decrease in the performance. These customer complaints can proceed from customer’s dissatisfaction in administrative and technical

issues, delays in deliveries, response time to customer with regard to any issue, and etc.

- **Cost/Revenue:** The deviation in project expenditure with respect to total revenue earned is a criterion to show the performance of the project. If this ratio increases, it can be said that project performance is decreasing.
- **Project Delay/Project Duration:** The difference between project's contractual planned termination date and real termination date is used to find out the schedule deviation in corresponding project. Schedule deviation indicates the lower performance of the project.
- **Penalty/Revenue:** In general, "penalty" is predefined in case of delay in contracts. If the delay results from the actions of the company, the penalty is imposed. This is not the same as the delay when customer may cause deviation in project duration and the company can not be punished for this delay. For instance, in a decision stage it can take too long to have a decision for a customer or the customer may delay to deliver some material/sub item that it is supposed to be procured by them according to the contract. Any penalty paid under a project is accepted as a decrease in project performance.

To determine the performances of the selected 35 projects, the weights are also required to be assigned to these criteria. Assignment of weights is made based on the opinions of the managers in the company. In the view of managers, there are 3 main issues that affect project performance, namely customer satisfaction, project expenditure and delay in project duration, and equal weights should be assigned to them. The assigned weights to the criteria are given in Table 10.

Table 10 Weights of criteria to measure project performance

Criteria	Weight	Sub criteria	Weight
Customer Satisfaction	1/3	Number of contract change	1/6
		Number of customer complaints	1/6
Project expenditure	1/3	Cost/Revenue	1/3
Delay in project duration	1/3	Delay/Project Duration	1/6
		Penalty/Revenue	1/6

Selected key performance indicators in this study are compatible with the literature. The number of metrics to measure the success of the projects could have been

increased to achieve more accurate finding about project performance, however, it was difficult to get data from the company due to confidentiality reasons.

3.2.2 Determination of Project Performance by using the weighted sum method

To measure project performances, the weighted sum method is used. The brief explanation about this method is given in literature review part. Because it is easy to use and complies with available data weighted sum method is used in this study. Since the ultimate aim of the study is to achieve the required leadership profile for complex project environment, the performance rankings are created for complex and noncomplex projects separately. Also, the rankings of all projects are given at the end of this part, to understand whether there is a difference in leadership trait without any classification on complexity.

As mentioned in Chapter 2, the following scheme is used to remove dimension or balance magnitude differences in objective functions through the application of the weighted sum method:

$$F_i^{trans} = \frac{F_i(x)}{\sqrt{\sum_{i=1}^m F_i(x)^2}}$$

3.2.2.1 Result of weighted sum method for complex projects

For the application of the weighted sum method, following input values are used.

Table 11 Complex Projects' Performance Criteria Values

Project	No. Contract Change	No. Customer Complaint	Cost/Revenue	Delay/Project Duration	Penalty/Revenue
Project_4	4	4	0.806	0.083	0.001
Project_8	0	0	0.605	0	0
Project_25	6	2	0.577	0	0
Project_3	3	2	0.664	0.167	0
Project_21	2	4	0.949	0.400	0.019
Project_15	3	3	0.710	0.333	0.016
Project_24	8	2	0.513	0	0
Project_26	0	0	1.035	0.200	0
Project_11	3	2	0.590	0	0
Project_20	3	0	8.103	0	0
Project_5	2	0	0.673	0	0
Project_14	2	0	1.075	0.167	0
Project_7	0	2	0.517	0	0
Project_6	0	0	0.995	0	0
Project_9	0	0	0.833	0.333	0
Project_30	2	1	0.924	0	0

After applying the weighted sum method, the complex projects are ranked based on their performances. The ranking is given in Table 12. At this stage, it is important to remind that the project having a higher weighted score was terminated with higher performance in the company.

Table 12 Weighted scores of complex projects

Projects	Weighted Scores *	Projects	Weighted Scores *
Project_8	-0.02	Project_14	-0.11
Project_6	-0.04	Project_25	-0.14
Project_5	-0.05	Project_3	-0.15
Project_7	-0.06	Project_24	-0.16
Project_30	-0.08	Project_4	-0.20
Project_26	-0.09	Project_15	-0.32
Project_11	-0.10	Project_20	-0.35
Project_9	-0.11	Project_21	-0.37

*Since all of the criteria that are used to measure project performance affect the projects negatively, in other words, since all the criteria are required to be minimized to achieve the highest performance, the weighted scores are multiplied by minus 1.

3.2.2.2 Classification of Complex Projects

After obtaining the ranking of complex projects based on their performances, now grouping of these projects based on their performance level is required. To do this, normality test to the calculated weighted scores is applied and it is found that this data does not show normality property. Therefore, the project that has an equal or greater weighted scores from the median value (-0.11) are accepted as high performance and others are accepted as low performance projects. (Results of normality tests applied to the data are given in APPENDIX F). The final list that shows high performance and low performance complex projects are given in Table 13.

Table13Complex Projects’ Classification as High and Low Performance

High Performance Complex Projects	Low Performance Complex Projects
Project_8	Project 25
Project_6	Project_3
Project_5	Project_24
Project_7	Project_4
Project_30	Project_15
Project_26	Project_20
Project_11	Project_21
Project_14*	
Project_9*	

*Although, Project 14 and Project 9 have performance values equal to median value, these projects are accepted as high performance to increase the data for high performance projects.

3.2.2.3 Result of weighted sum method for noncomplex projects

For the application of the weighted sum method, following input values are used.

Table14Noncomplex Projects’ Performance Criteria Values

Project	No. Contract Change	No. Customer Complaint	Cost/Revenue	Delay/Project Duration	Penalty/Revenue
Project_17	1	0	0.606	0	0
Project_19	0	0	0.694	0	0
Project_1	3	0	0.929	0.333	0.004
Project_12	0	0	0.942	0	0
Project_16	0	0	0.786	0	0
Project_18	2	0	0.949	0.400	0.019
Project_23	0	0	0.748	0	0
Project_27	0	0	0.423	0.200	0
Project_29	0	0	0.798	0.400	0
Project_13	0	0	0.633	0	0
Project_28	0	3	0.927	0.125	0
Project_31	2	0	0.646	0.056	0
Project_32	0	2	0.273	0.100	0
Project_10	2	0	0.427	0	0
Project_22	0	0	0.588	0	0
Project_33	0	0	0.642	0	0
Project_34	0	0	0.393	0	0
Project_2	0	0	0.664	0	0
Project_35	0	0	0.563	0	0

After applying the weighted sum method, the noncomplex projects are ranked based on their performances. The ranking is given in Table 15. At this stage, it is important to remind that the project having a higher weighted score was terminated with higher performance in the company.

Table15Noncomplex Projects’ Performance Ranking

Projects	Weighted Scores *	Projects	Weighted Scores *
Project_34	-0.04	Project_12	-0.10
Project_35	-0.06	Project_17	-0.10
Project_2	-0.07	Project_10	-0.12
Project_13	-0.07	Project_32	-0.15
Project_22	-0.07	Project_31	-0.16
Project_33	-0.07	Project_29	-0.18
Project_19	-0.08	Project_28	-0.27
Project_23	-0.08	Project_1	-0.32
Project_16	-0.09	Project_18	-0.43
Project_27	-0.09		

*Since all of the criteria that are used to measure project performance affect the projects negatively, in other words, since all the criteria are required to be minimized to achieve the highest performance, the weighted scores are multiplied by minus 1.

3.2.2.4 Classification of Noncomplex Projects

Similar to complex project case, normality test to the calculated weighted scores is applied to classify projects based on their performances. It is found that the data does not show normality property. (Results of normality tests applied to the data are given in APPENDIX G)

Therefore, the project that has an equal or a greater weighted scores from the median value (-0,09) are accepted as high performance and others are accepted as low performance projects. The final list that shows high performance and low performance noncomplex projects are given in Table 16.

Table 16 Noncomplex Projects' Classification as High and Low Performance

High Performance Noncomplex Projects	Low Performance Noncomplex Projects
Project_34	Project_17
Project_35	Project_12
Project_22	Project_10
Project_13	Project_32
Project_33	Project_31
Project_2	Project_29
Project_19	Project_28
Project_23	Project_1
Project_16*	Project_18
Project_27*	

*Although, Project 16 and Project 27 have performance values equal to median value, these projects are accepted as high performance to increase the data for high performance projects.

3.3 Determination of competency profile for project managers

3.3.1 Application of MPS Survey

In this study, leadership behaviors are evaluated by using the ‘‘Managerial Practices Survey’’ developed by Yukl (2012). This survey comprises four different scales: task, relation, change oriented and external leadership. There are a lot of research and study using this survey due to its ease of use and competence to test current leadership styles. In their paper, Gill et al. (2005) have demonstrated the appropriate psychometric characteristics of this questionnaire.

The MPS was designed by Yukl (2012) to measure observable behaviors of managers or administrators in organizations. The application area of MPS is defined by Yukl as primarily for use by the subordinates to describe the leadership behavior of their immediate supervisor or team leader. Also, the MPS can be used by peers who have ample opportunity to observe the leader.

According to Yukl, the MPS was not designed for leaders to describe their own behavior, and such descriptions are accepted less accurate than the collective responses of several subordinates. If a leader describes his/her behavior using MPS,

several subordinates (in this case, Yukl calls the subordinates as supplement) of the leader should also evaluate his/her behavior to get more accurate results.

In our study, Yukl's Managerial Practices Survey (MPS) is used without any modification to determine the project managers' profile in the company for selected 35 projects. Written permission received from Gary Yukl to use MPS in our study are given in Appendix H. Since Yukl permits to show only the scale definitions and no more than one sample item for each scale, the used MPS is given Appendix H in a limited manner. For every project, the questionnaire is filled by a project manager and 2 people from his/her project team as supplement mentioned by Yukl. 35 different leaders describe their own behavior and 2 people from project team describe the behavior of the corresponding leader. The 5-point response scale are offered to attendees for each question (1 = not at all, 5 = to a great extent) in the survey.

3.3.2 Analysis method for MPS Result

After collection of MPS result, the results are entered into the SPSS Software to analyze. For the analysis of the data, the first thing is to decide which tests are used. Since the data is ordinal, nonparametric tests are suitable to analyze the results.

Nonparametric tests are called as distribution free tests, this means that it is not impossible to make analysis based on approximately normally distribution of outcomes. However, parametric tests include specific probability distributions such as normal distribution. Although, nonparametric tests are less powerful when compared to their parametric counterparts, because of the collected data property nonparametric tests are used in this study. In our study, to understand differences in leadership behaviors in complex and noncomplex projects, 35 projects were separated into 4 groups in the above sections as high performance complex and non complex, and low performance complex and noncomplex. Therefore, this separation causes small data sets in each group to use parametric analysis. In this part of the study, due to small samples and unknown distributions, nonparametric analyses are used.

Among nonparametric tests, Mann-Whitney U test is selected, this test is used to compare differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed. Pérez et al. (2015)

define the Mann–Whitney U-test is a non-parametric method used to test whether two independent samples of observations are drawn from the same or identical distributions.

3.3.3 Reliability of MPS Result

Before going through the application of the nonparametric tests, reliability analysis is made to the data obtained from MPS results. To test the consistency, Cronbach's alpha test using the reliability command in SPSS Software is applied. Cronbach's alpha reliability method is developed by Cronbach in 1951 and is the most widely used reliability measure used in the social and organizational science (Bonett & Wright, 2015). Bonett & Wright (2015) describe this method as “reliability of sum (or average of q measurements where q measurements may represent q raters, occasions, alternatives, forms, questionnaire/test items”. Since all alpha reliability values are greater than 0.70, it is accepted that the data obtained from the questionnaire are reliable (Alpha reliability values are given in detail in APPENDIX I). Therefore, the data can be used for the analysis to achieve a solution about successful project manager's profile for complex and noncomplex projects. The reliability of the data for leadership styles is given in Table 17.

Table 17 Reliability values for leadership styles

Leadership Styles	Reliability Values
Task Oriented	0.901
Relations Oriented	0.878
Change Oriented	0.879
External	0.835

3.3.4 MPS Result

3.3.4.1 Differences in leadership competency between high performance and low performance projects in the case of complexity classification

In previous sections, firstly 35 projects are grouped as complex and non-complex projects after application of AHP, then the complex and noncomplex projects are grouped as high performance and low performance projects after application of the weighted sum method. In this section, nonparametric Mann-Whitney U Test is made

to determine whether there is a significant difference between the project manager’s leadership trait for high performance and low performance projects. The results of the nonparametric tests for complex and noncomplex projects are summarized in Table 18: (details are given in APPENDIX J&APPENDIX L)

Table 18 Summary of nonparametric Test Results for Leadership styles

Leadership style	Nonparametric Test	Complex Projects	Noncomplex Projects
		Same/Different leadership style for high and low performance project	Same/Different leadership style for high and low performance project
Task Oriented	Mann-Whitney U Test	Same	Different
Relations Oriented	Mann-Whitney U Test	Same	Same
Change Oriented	Mann-Whitney U Test	Same	Different
External	Mann-Whitney U Test	Same	Different

As summarized in Table 16:

For Complex Projects:

- Insufficient evidence is obtained to conclude that project managers of high performance and low performance complex projects show differences in task oriented, relations oriented, change oriented and external competency level.

For Noncomplex Projects:

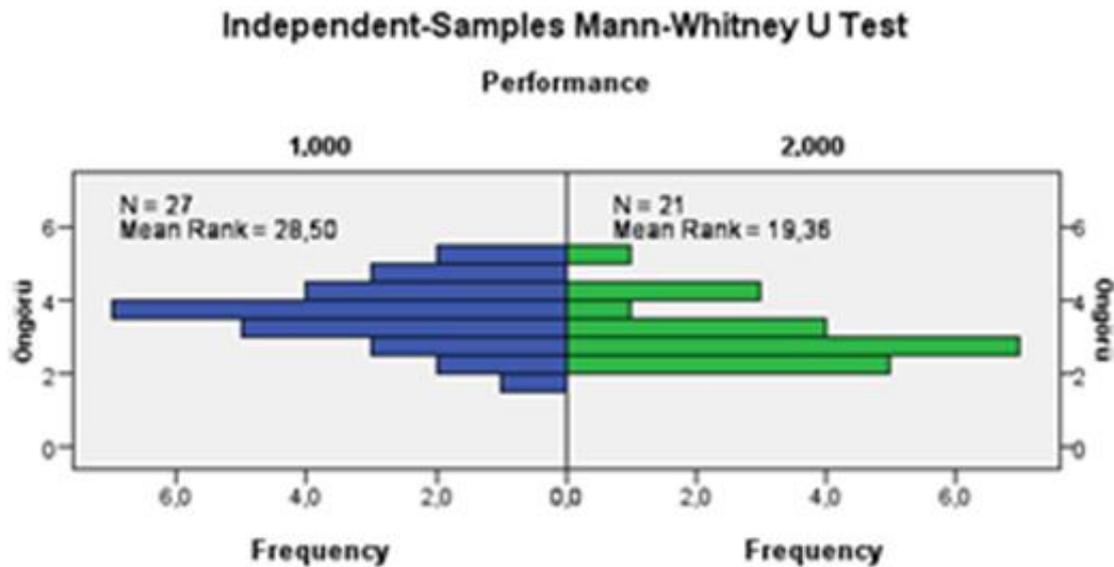
- High performance noncomplex projects’ managers show statistically significantly more task oriented, change oriented and external leadership styles. However, insufficient evidence exists to conclude that project managers of high performance and low performance noncomplex projects are different in relations-oriented leadership style.

For further analysis, nonparametric test (Mann-Whitney U Test) is applied to 15 specific leadership behaviors and Table 19 summarized the results of the test (details are given in APPENDIX K & APPENDIX M):

Table 19 Summary of nonparametric Test Results for leader behaviors

Leadership style	Behaviors	For Complex Projects	For Noncomplex Projects
		Same/Different leadership behavior for high and low performance project	Same/Different leadership behavior for high and low performance project
Task-oriented	Clarifying	Same	Different
	Planning	Same	Different
	Monitoring operations	Same	Same
	Problem Solving	Same	Same
Relations-oriented	Supporting	Same	Same
	Developing	Same	Same
	Recognizing	Same	Same
	Empowering	Same	Same
Change-oriented	Advocating change	Same	Same
	Envisioning Change	Different	Same
	Encouraging innovation	Same	Different
	Facilitating collective learning	Same	Same
External	Networking	Same	Different
	External monitoring	Same	Different
	Representing	Same	Different

For complex projects, Mann-Whitney U Test shows that there is no significant difference in leadership behaviors except “Envisioning Change” for high performance and low performance projects. For high performance complex projects, project managers show statistically significantly more “envisioning change” property when compared to low performance complex projects. Higher mean rank illustrates this finding in Figure 7. Therefore, at this point it can be concluded that managers that shows “envisioning change” characteristics are more successful in the management of complex projects.



*In Mann-Whitney U test, two groups are defined and the distributions of these two groups are compared. In this test, high performance complex projects are grouped under the name “1.000”, while low performance complex projects are grouped under the name “2.000”.

Figure 7 Mann-Whitney U Test Results of “Envisioning Change” for complex projects

For noncomplex projects, Mann-Whitney U Test shows that the distribution of data is different in “Clarifying”, “Planning”, “Encouraging Innovation”, “Networking”, “External monitoring” and “Representing” across high performance and low performance noncomplex projects. For high performance noncomplex projects, project managers show significantly more “Clarifying”, “Planning”, “Encouraging Innovation”, “Networking”, “External monitoring” and “Representing” behavior when compared to low performance noncomplex projects. It is important to note that in all behaviors under leadership style of “external”, project managers are different from the manager of low performance noncomplex projects. Therefore, at this point it can be concluded that managers that shows the external leadership style are more successful in the management of noncomplex projects.

3.3.4.2 Differences in leadership style between high performance and low performance projects without complexity classification

From the beginning of the study, all of the analyses are made under the classification of projects based on complexity. To find out whether the deduced solutions are suitable, changes in results are examined without grouping the projects as complex

and noncomplex. To do this, 35 projects are sorted based on their performances by applying the weighted sum method, and they are separated as high performance and low performance. (All calculation steps of this analysis are given in APPENDIX N). After grouping the projects as high performance and low performance, Mann Whitney U Tests are applied to the groups. Table 20 summarized the results of the analysis for leadership styles and Table 19 for leadership behaviors (Details are given in APPENDIX O & APPENDIX P).

Table 20 Summary of Nonparametric Test Results across leadership style for complex, noncomplex and whole projects grouped as high performance and low performance

Leadership style	Nonparametric Test	For all projects
		Same/Different leadership style for high and low performance project
Task Oriented	Mann-Whitney U Test	Same
Relations Oriented	Mann-Whitney U Test	Same
Change Oriented	Mann-Whitney U Test	Different
External	Mann-Whitney U Test	Same

This analysis shows change-oriented leadership characteristics of the project manager can affect the performance of the projects. This result is compatible with the results obtained from prior analysis, since “envisioning change” and “encouraging innovation” behaviors under change-oriented leadership style can be seen as critical for the management of complex and noncomplex projects respectively. To analyze the situation deeply, the nonparametric tests are applied to 15 specific leadership behaviors under meta-categories, Table 21 summarized the results:

Table 21 Summary of nonparametric Test Results of leader behaviors for complex, noncomplex and whole projects grouped as high performance and low performance

Leadership style	Behaviors	For all projects
		Same/Different leadership behavior for high and low performance project
Task-oriented	Clarifying	Same
	Planning	Same
	Monitoring operations	Same
	Problem Solving	Same
Relations-	Supporting	Same

		For all projects
Leadership style	Behaviors	Same/Different leadership behavior for high and low performance project
oriented	Developing	Same
	Recognizing	Same
	Empowering	Same
Change-oriented	Advocating change	Same
	Envisioning change	Different
	Encouraging innovation	Same
	Facilitating collective learning	Same
External	Networking	Same
	External monitoring	Different
	Representing	Same

According to the test results of leadership behaviors across high performance and low performance projects, project managers show different behaviors in “Envisioning change” under change-oriented leadership styles and in “external monitoring” under external leadership style. Therefore, “external monitoring” and “envisioning change” are vital characteristics for project managers to be successful in project management.

CHAPTER 4

DISCUSSION OF FINDINGS

In the company, all the projects are managed based on the same methodology without any classification about their size, technical requirements and etc. and project managers are assigned to the projects based on their workload, experience and opinions of top managers of the company. In the company, it has seen that two projects managed by the same manager can terminate with different performances; also in some cases project performance has remained stable regardless of the assignment of different personnel as manager. Therefore, it is thought that termination of projects as high performance and low performance can be related to the project manager's competency level as well as project's complexity. To understand the issue, the study was designed to present required leadership competency profiles in complex project management environment. To do this, 35 projects that were completed in the company are analyzed based on complexity factors that are mentioned in literature. The relative complexities of the projects are found out by using Analytic Hierarchy Process (AHP), and projects are grouped as complex and noncomplex. Also, by using the data obtained from the company about project performance as inputs, the weighted sum method is used to group projects as completed with high performance and completed with low performance. Finally, Managerial Practices Survey (MPS) is applied to determine the competency profiles of the leaders to be successful in the complex projects. In this study, projects completed with high performance are accepted as successful projects and the overall ambition of this study to find out whether there is a significant difference in the behaviors of project managers who led successful projects. Therefore, this study is completed in three stages, namely complexity measurement, project performance measurement and determination of leadership competency. As mentioned in the literature review part, there are some researches on these topics; however, none of them has focused all of them at the same time.

4.1 Discussion about project complexity

To measure project complexity, AHP (Analytic Hierarchy Process) is used in this study as in the study of Vidal et al. (2011a&2011b). Firstly, literature review is done to find out complexity factors and unrelated complexity factors are eliminated with brainstorming sessions with top management of the company. Then, with the help of the prepared questionnaire, pairwise comparison between main factors and pairwise comparisons between sub-factors under each main factor are made by the respondents and relative importance of each complexity factors and subfactors are determined. Finally, the relative complexities of the projects are determined. To understand the difference between the characteristics of the project managers who had led complex and noncomplex projects, the projects are categorized based on their complexity. To do this, 2 levels were defined, namely complex and non-complex. Projects that have lower complexity are accepted as non-complex in this study. During the application of the AHP, ensuring consistent pairwise comparison collected from attendees is troublesome because of high number of factors/subfactors and projects. If the consistency is not enough for the evaluation, the comparison is made again by the same person until achieving a proper consistency ratio.

4.2 Discussion about project performance measurement

In this study, customer satisfaction, project expenditure and delay in project duration are accepted as key performance indicators and they are measured with the help of following criteria in the company:

- Number of Contract Change
- Number of Customer Complaint
- Cost/Revenue
- Project Delay/Project Duration
- Penalty/Revenue

According to PMI (2013), the success of the project should be measured in terms of “completing the projects within the constraints of scope, time, cost, quality, resources and risk as approved between the project managers and senior management”. To measure project performances, Xia and Lee (2004) use delivery time, cost, functionality and user satisfaction as performance indicators. Similarly, in their study

Kendra and Taplin (2004) claims that the most important metrics to find out success of projects are project time-duration, cost-budget variances and quality. It is seen that, the selected key performance indicators in this study are compatible with the literature. The number of metrics to measure the success of the projects could have been increased to achieve more accurate finding about project performance, however, it was difficult to get data from the company due to confidentiality reasons.

4.3 Discussion about required leadership competency profile

4.3.1 Leadership Competency Profile for Complex Projects

Due to the dynamic environments caused by complexity in project management environment, today's leaders must change the structure, culture, the strategy to meet the requirements of environment they are in (Duin & Baer, 2010). A leader must be aware of the external situation (Smith & Lewis, 2011) and open to generate innovation, learning and adaptation in the case of complexity (Uhl-Bien et al., 2007).

In our study, it is found that successful complex project managers are different in "envisioning change" only. This behavior is seen in change-oriented leadership style. This type of leaders initiate and encourage change (Yukl, 2012).

"Envisioning change" is defined by Yukl (2012) as "an effective way for leaders to build commitment to new strategies and initiatives". Leaders with this personality trait are expected to articulate a clear, appealing vision which can be attained by the work unit or organization. Although there are many studies that can be accepted as evidence that articulating an appealing and inspiring vision is relevant for effective leadership (e.g. Elenkov, Judge & Wright, 2005; Keller, 2006); to claim that "envisioning change" is the only behavior that causes to complete a complex projects with high performance is very strong.

As it can be seen in the Appendix L, the survey results show that project managers of high performance complex projects scored high in all dimensions in addition to "envisioning change". Therefore, assignment of a person that behaves more positively in "envisioning change" in addition to other leadership properties can be a good choice to manage the complex projects successfully.

Similar to our study, Muller and Turner (2010) examined the leadership competency profiles of successful project managers in different types of projects. Differences by project type were accounted for through categorization of the projects by their application area, complexity, importance and contract type. In their study, to analyze the differences in leadership behavior, the fifteen leadership competencies survey developed by Dulewicz and Higgs (2005) is used. In this study, Muller and Turner (2010) tried to find out the differences in leadership profile by complexity of projects in their study. After the analysis made on the complexity of the projects, profiles of project managers of the most successful projects having low complexity were not developed because of the small sample size. According to this study, managers of the most successful projects having medium complexity are strong in critical thinking, managing resources, empowering, and developing, as well as self-awareness, sensitivity, influence, and conscientiousness, while managers of the most successful projects with high complexity scored high in all dimensions. Muller and Turner (2010) concluded that vision & imagination, influence and motivation are significantly higher among managers of high complexity projects than in those of medium complexity projects and motivation is higher in high complexity projects than in low complexity projects. As in Table 19, “vision & imagination” has a similar definition with “envisioning change” under MPS. Therefore, it can be said that the finding of our study is supported by the study of Muller and Turner (2010).

Additionally, Thomas and Mengel (2008) tried to prepare project managers to deal with complexity in their study. Similar to our findings, the significance of a vision, shared beliefs and values have been identified and demonstrated to be a successful project manager under a complex project environment with the help of this study.

Furthermore, Christenson and Walker (2004) argue that “vision is a significant contributing factor to project success” and after a case study from a major information technology project conclude that “vision may be the key to successful project outcomes”.

Finally, in the light of literature in addition to our findings, “vision” (“envisioning change”) is a vital leadership trait to be successful in complex project management

environment. This will also lead to success in organization. Kendra and Taplin (2004) state that “for organizations to be successful with the adoption of project management, they need to establish a shared set of values and beliefs, that aligns with the social and technical aspects of project management to achieve the organization’s business objectives”.

4.3.2 Leadership Competency Profile for Noncomplex Projects

For noncomplex projects, “Clarifying”, “Planning”, “Encouraging Innovation”, “Networking”, “External monitoring” and “Representing” traits of project managers across high performance and low performance noncomplex projects are different. “Clarifying” property of leadership is explained by Yukl (2012) as; “leaders use clarifying to ensure that people understand what to do, how to do it, and the expected results” while “Planning” is said as “it includes making decisions about objectives and priorities, organizing work, assigning responsibilities, scheduling activities, and allocating resources among different activities”. These behaviors are related to “task-oriented” leadership style and it shows that people with more “task oriented” leadership behavior can manage a noncomplex project more successfully. Also, in addition to “task oriented”, “external” leadership style is vital for the success of noncomplex projects. According to Yukl (2012), in addition to influencing internal events in the work unit, most leaders can facilitate performance with the behaviors that provide relevant information about outside events, get necessary resources and assistance, and promote the reputation and interests of the work unit. Therefore, we can conclude that in the assignment of project managers to the noncomplex projects, “task oriented” and “external” leadership styles are important in addition to “Encouraging Innovation” behavior under “change oriented”.

As mentioned before, Muller and Turner (2010) tried to find out the differences in leadership profile by complexity of projects in their study. In this study, projects are categorized as high, medium and low complexity. However, after the analysis made on the complexity of the projects, profiles of project managers of the most successful projects having low complexity were not developed because of the small sample size (noncomplex projects are projects that have low complexity in this study).

Different from Muller and Turner(2010), as we know, no research has been made and no paper has been written to understand the specific behavior of the manager of noncomplex projects although there is increasing number of articles to define the complexity and required leadership competency.

4.3.3 Leadership Competency Profile without classification about complexity

Crawford (2007) defined project manager competence as a combination of knowledge (qualification), skills (ability to do a task), and core personality characteristics (motives traits self concepts) that lead to superior results. Crawford stated that project success and competence of project management personnel are closely interrelated, and the competence of the project manager is in itself a factor in the successful delivery of projects.

If the projects are not classified as complex and noncomplex in our study, it is seen “envisioning change” under change oriented leadership style is still critical leadership behavior in the performance of the projects. It is known that, change-oriented leaders can cope well with unstable environments under complexity because they can include inspiration, motivation, intellectual stimulation, strategic vision articulation, sensitivity to the environment, and a risk-taking attitude. In his research, Finkelstein (2003) claims that “consistently pursuing a risky and unrealistic vision is a major reason for serious performance declines in organizations” and Keller (2006) says “appealing and inspiring vision is relevant to effective leadership”.

In addition to “envisioning change”, “external monitoring” is also a critical behavior under the external leadership style to be successful in projects without classification on complexity. Summer, Bock and Giamartino (2006) claim that project success is significantly related to the external perceptions of effective leadership. In this study, this external perception includes communications, interpersonal skills, and the soft skills that are required for collaboration and cooperation.

In our study, it is seen that required leadership competency profile is different in complex, noncomplex and all projects without any classification on complexity. If the findings of the analyses made had been same regardless of the classification on the complexity, a deduction would have been made about meaningless of this type of classification. However, this is not the case and it is still deduced that classification of projects based on complexity is vital to manage the projects effectively and “envisioning change” is an important leadership behavior that can affect performance of complex projects.

CHAPTER 5

CONCLUSION

The overall ambition of this thesis is to find out whether required leadership competency profiles differ to be successful in complex project management. After all of the analysis, we conclude that there can be a relation between complex project's success and its leaders/project managers "envisioning change" characteristics under change-oriented leadership style. Also, "Clarifying", "Planning", "Encouraging Innovation", "Networking", "External monitoring" and "Representing" may be vital to be successful in non-complex project management environment.

In our study, limited number of respondents made pairwise comparisons for complexity measurement and answered managerial practices survey. This study can be enhanced by reaching more project managers and more projects data in a company. By ensuring large sample:

- The relations between project performance and leadership behaviors can be evaluated deeply across all leadership styles and specific leadership behaviors.
- If large data set shows normality property and if it is possible to use parametric tests, more reliable results can be obtained. Since, it is worth noting that nonparametric tests generally have less statistical power when compared to parametric tests because of an increased chance of a Type II error.)

Additionally, through the application of the methodology, we have encountered some limitations and problem; in future research some precautions should be taken:

- Rankings formed after the application of AHP can vary easily when adding and subtracting a complexity factor/sub factor. We thus recommend the users to give specific attention to the step when the set of sub factors/factors are decided.
- Ranking of projects is made based on evaluators' (in our case top managers of the company) information, therefore the right ranking of project complexity

is strictly related to the quality of pairwise comparisons. In future studies, number of evaluators can be increased to obtain a more reliable solution.

- To apply AHP, it is assumed that all the complexity factors and main factors are independent to each other. Interrelation of factors may be analyzed in future study or independencies of the factors may be shown via a reliable technique.
- In this study, literature review is done to understand complexity factors and unrelated complexity factors are eliminated with brainstorming sessions with top management of the company and pairwise comparisons are made to apply AHP. 44 different sub criteria were compared pairwise to compute relative importance of the corresponding criteria and 35 projects are compared pairwise under all sub criteria and criteria. Therefore, AHP requires huge questionnaire that has to be filled by attendees. In future research, to eliminate sub factors, firstly different multiobjective decision making criteria can be used, and then AHP can be applied to the remaining sub factors.
- In spite of the easiness in application and suitability to the situation of AHP, the model can be extended using ANP (Analytic Network Process). Although, it is assumed that all the factors/sub factors are independent to each other in the application of AHP, building up an ANP network structure will include interdependence and feedback.
- Since the company is in the defense business field, limited data were obtained to compute project performance. In future research, more detailed model to calculate project performance can be used to eliminate disadvantages of the weighted sum method.
- This study may be accepted as a base study to understand the relationships between characteristics of project managers and performance of projects considering complexity. In future study, a tool may be developed to assign the right person to the right projects as project manager after entering their specific characteristics into the model.

Based on our solutions after the whole analysis, the practical implications of the results and recommendations to the company can be listed as follows:

- Because of the different required competency, project complexity should be considered before deciding about project manager. Projects can be grouped as complex or not.
- Leadership competencies should be taken into account during the assignment of project managers to projects. MPS can be applied to the candidates of project managers and the results are evaluated.
- If the project is complex, results of the survey are evaluated for 15 specific behaviors. The candidate that shows more “envisioning change” property can be a good option to assign as a project manager.
- If the project is noncomplex, results of the survey are evaluated for 15 specific behaviors. The candidate that shows more suitable behaviors to “task oriented” and “external” leadership styles can be a good option to assign as a project manager.
- To increase success of the project managers, organization provide trainings for project managers not only to enhance technical and management skillsbut also to develop leadership competencies.

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APPENDIX A
Complexity Criteria and Sub criteria

Ana Kriterler	Alt Kriterler	Criteria	Sub criteria	Sources
Teknik Konular	Yeni bir teknoloji geliştirme gereksinimi	Technical Issues	Unfamiliar technology	(Maylor, 2013), (Bar-Yam,2003), (Baccarani,1996)
	Şirket için yeni bir teknolojinin kullanılma ihtiyacı		Technology development requirements	(Vidal et al.,2011a), (Vidal et al.,2011b), (BarYam ,2003), (Maylor,2013), (Xia&Lee,2004)
	Projede farklı teknolojilerin kullanımı		Variety of technologies used during the project	(Vidal et al.,2011a), (Vidal et al., 2011b), (Lauma, 2006), (Chu et al,2003)
	Kullanılan teknolojilerin birbirleri ile ilişkili olması		Interdependencies among technologies	(Maylor, 2013)
	Yaratıcılık gereksinimi		Demand of creativity	(Vidal et al.,2011a), (Vidal et al., 2011b)
	Farklı teknik disiplinlerin entegrasyonu		Integration across multiple technical disciplines	(Maylor, 2013),(Williams, 2012)
	Kapsam genişliği		Largeness of scope (number of components, etc.)	(Vidal et al.,2011a), (Vidal et al., 2011b), (Baccarani,1996),(Bertelsen,2004), (Lauma,2006)
	İlişkili teknik spesifikasyonlar		Specification interdependence	(Vidal et al.,2011a), (Vidal et al., 2011b)
Organizasyonel Konular	Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	Organizational Issues	Distributed/Virtual team	(Vidal et al.,2011a), (Vidal et al., 2011b), (Bar-Yam,2003), (Lauma,2006)
	Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği		Number and variety of resources	(Vidal et al.,2011a), (Vidal et al., 2011b), (Baccarani,1996),(Bar-Yam,2003)

Ana Kriterler	Alt Kriterler	Criteria	Sub criteria	Sources
	Ortak kaynak kullanan proje sayısı		Number of companies/projects sharing their resources	(Vidal et al.,2011a), (Vidal et al., 2011b)
	Proje ile ilgili bölüm/departman sayısı		Number of departments involved	(Vidal et al.,2011a), (Vidal et al., 2011b), (Baccarani,1996)
	Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi		Managing a remote location	(Cookie-Davies et al.,2003), (Kähkönen,2008)
	Kaç farklı amaç/hedef tanımlandığı		Number of objectives	(Vidal et al.,2011a), (Vidal et al., 2011b), (Baccarani,1996)
	Yoğun öğrenme/bilgi ihtiyacı		Intensive learning needs	(Baccarani,1996)
	Hiyerarşi seviyelerinin sayısı		Number of hierarchical levels	(Vidal et al.,2011a), (Vidal et al., 2011b)
	Çalışanların sayısı		Staff quantity	(Vidal et al.,2011a), (Vidal et al., 2011b)
	Proje kapsamında kaç farklı karar alınacağı		Number of decisions to be made	(Vidal et al.,2011a), (Vidal et al., 2011b)
	Farklı bölümlerin birbirleri ile iletişimi		Communication between different parts of the organization	(Snowden, 2007)
	Benzer projelerden kazanılmış tecrübe		Experience	(Vidal et al.,2011a), (Vidal et al., 2011b), (Baccarani,1996), (Cookie-Davies et al.,2003), (Williams,2002)
	Proje ekibi yetkinliği		Project Team	(Vidal et al.,2011a), (Vidal et al., 2011b), (Baccarani,1996), (Cookie-Davies et al.,2003), (Kähkönen,2008), (Williams,2002)
	Birden fazla proje ekibine atanan personel		Project team member assigned to many projects	(Maylor, 2013)

Ana Kriterler	Alt Kriterler	Criteria	Sub criteria	Sources
	Personel için net olarak tanımlanmamış roller ve sorumluluklar		Roles and responsibilities unclear	(Baccarani,1996), (Williams,2002)
Bağımlılıklar	Çevreye olan bağımlılıklar (çevresel koşulların proje üzerine etkisi)	Interdependencies	Dependencies with the environment	(Vidal et al.,2011a), (Vidal et al., 2011b), (Baccarani,1996)
	İnsan, malzeme veya herhangi bir kaynağın ortak kullanımı		Avalability of people, material and any resources due to sharing	(Vidal et al.,2011a), (Vidal et al., 2011b), (Williams,2002)
	Lokasyonlar, departmanlar ve şirketler arasında bağımlılık		Interdependencies between sites, departments and companies	(Vidal et al.,2011a), (Vidal et al., 2011b)
	Proje ağları arasındaki etkileşim ve geri besleme		Interconnectivity and feed back loops in the task and project networks	(Vidal et al.,2011a), (Vidal et al., 2011b)
	Proje ekibi arasındaki işbirliği ve iletişim		Team cooperation and communication	(Vidal et al.,2011a), (Vidal et al., 2011b), (Snowden, 2007)
	Farklı gündemleri/programları olan insanların yönetilmesi		Managing different agendas of the people involved	(Vidal et al.,2011a), (Vidal et al., 2011b), (Baccarani,1996), (Maylor,2013)
	Proje takvimlerinin birbirleri ile ilişkili olması		Dependencies between schedules	(Vidal et al.,2011a), (Vidal et al., 2011b), (Xia&Lee,2004)
	Projelerin birbirleri ile ilişkili amaç/hedeflerinin olması		Interdependencies of objectives	(Vidal et al.,2011a), (Vidal et al., 2011b), (Baccarini,1996)
	Hükümet politikalarındaki projeyi etkileyen değişiklikler		Dependencies in government policies	(Baccarini,1996), (Vidal et al.,2011a), (Vidal et al., 2011b), (Williams,2002)
	Müşterinin proje faaliyetlerine müdahalesi		Too much interference from the client	(Bar-Yam,2003),(Vidal et al.,2011a), (Vidal et al., 2011b)
	Paydaşlar arası kültürel farklılıklar		Cultural Differences	(Bar-Yam,2003),(Lauma,2006)

Ana Kriterler	Alt Kriterler	Criteria	Sub criteria	Sources
	Projede bir teslimatın farklı bir teslimatı etkilemesi		Dependence of one deliverable on the other	(Vidal et al.,2011a), (Vidal et al., 2011b)
Proje Yapısından Kaynaklı Konular	Teslimat adedi	Structural Issues	High number of deliverables	(Williams,2002), (Bertelsen,2004),Baccarani(1996)
	Proje kapsamında tanımlı aktivitelerin sayısı		Number of activities	(Vidal et al.,2011a), (Vidal et al., 2011b)
	Proje süresi		Duration of the project	(Vidal et al.,2011a), (Vidal et al., 2011b), (Maylor,2013), (Baccarani,1996)
	Gerçekçi olmayan teslimat takvimleri		Unrealistic time frames	(Maylor, 2013)
	Zamanında tanımlanamayan kilit riskler		Key risks not identified early	(Baccarani,1996)
	Proje kapsamını/takvimini sağlayamayan satınalma işlemleri		Procurement systems did not assist in managing the scope	(Maylor, 2013)
	Proje fazları arasındaki bağımlılıklar		Level of interrelations between phases	(Vidal et al.,2011a), (Vidal et al., 2011b)
	Paydaş sayısı ve çeşitliliği		Number and variety of stakeholders	(Vidal et al.,2011a), (Vidal et al., 2011b), (Bertelsen,2004), (Lauma, 2006)
	Finansman kaynaklarının çeşitliliği		Funding sources and processes	(Vidal et al.,2011a), (Vidal et al., 2011b)

APPENDIX B

Survey for Pairwise Comparison

Bu çalışmada proje kompleksitesini belirleyen ana faktörler 6 farklı ana başlık altında verilmiştir. Aşağıdaki bu ana faktörlerin hangilerinin komplekte üzerinde daha fazla etkili olduğunu belirlemek amacıyla ikili karşılaştırmalar yapılmaktadır.
Lütfen alt kriterler ile ilgili ikili karşılaştırmaları yaptıktan sonra bu sayfadaki karşılaştırmaları yapınız.

Proje kompleksitesi üzerindeki etkileri açısından değerlendirildiğinde aşağıdaki iki kriterden hangisi diğerinden daha önemlidir ve kaç kat daha önemlidir?																		
A	A, B'den daha önemli								Eşit önemli	B, A'dan daha önemli								B
	9	8	7	6	5	4	3	2		1	2	3	4	5	6	7	8	
Teknik Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Organizasyonel Konular
Teknik Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stratejik Konular
Teknik Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bağımlılıklar
Teknik Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje Yapısından Kaynaklı Konular
Teknik Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje Ekibi Davranışı ile ilgili Konular
Organizasyonel Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stratejik Konular
Organizasyonel Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bağımlılıklar
Organizasyonel Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje Yapısından Kaynaklı Konular
Organizasyonel Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje Ekibi Davranışı ile ilgili Konular
Stratejik Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bağımlılıklar
Stratejik Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje Yapısından Kaynaklı Konular
Stratejik Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje Ekibi Davranışı ile ilgili Konular
Bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje Yapısından Kaynaklı Konular
Bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje Ekibi Davranışı ile ilgili Konular
Proje Yapısından Kaynaklı Konular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje Ekibi Davranışı ile ilgili Konular

1	Eşit önemli
3	Biraz önemli
5	Fazla önemli
7	Çok fazla önemli
9	Aşırı derece önemli
2,4,6,8	Ara değerler

Bu sayfada "Teknik Konular" ana başlığı ile projenin sahip olduğu teknik özelliklerin (teknoloji kullanımı, geliştirilmesi, teknik spesifikasyonlar vb.) kompleksite üzerindeki etkisini belirlemek amacı ile ikili karşılaştırmalar yapılmaktadır.

Aşağıdaki iki kriterden hangisi kompleksite açısından "teknik konular" ana kriterini daha çok etkiler ve kaç kat daha çok etkiler?

A	A, B'den daha önemli								Eşit önemli	B, A'dan daha önemli								B
	9	8	7	6	5	4	3	2		1	2	3	4	5	6	7	8	
Şirket için yeni bir teknolojinin kullanılma ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Yeni bir teknoloji geliştirme gereksinimi
Şirket için yeni bir teknolojinin kullanılma ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projede farklı teknolojilerin kullanımı
Şirket için yeni bir teknolojinin kullanılma ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kullanılan teknolojilerin birbirleri ile ilişkili olması
Şirket için yeni bir teknolojinin kullanılma ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yaratıcılık gereksinimi
Şirket için yeni bir teknolojinin kullanılma ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı teknik disiplinlerin entegrasyonu
Şirket için yeni bir teknolojinin kullanılma ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kapsam genişliği (bileşen sayısı vb.)
Şirket için yeni bir teknolojinin kullanılma ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	İlişkili teknik spesifikasyonlar
Yeni bir teknoloji geliştirme gereksinimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projede farklı teknolojilerin kullanımı
Yeni bir teknoloji geliştirme gereksinimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kullanılan teknolojilerin birbirleri ile ilişkili olması
Yeni bir teknoloji geliştirme gereksinimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yaratıcılık gereksinimi
Yeni bir teknoloji geliştirme gereksinimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı teknik disiplinlerin entegrasyonu
Yeni bir teknoloji geliştirme gereksinimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kapsam genişliği (bileşen sayısı vb.)
Yeni bir teknoloji geliştirme gereksinimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	İlişkili teknik spesifikasyonlar
Projede farklı teknolojilerin kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kullanılan teknolojilerin birbirleri ile ilişkili olması
Projede farklı teknolojilerin kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yaratıcılık gereksinimi
Projede farklı teknolojilerin kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı teknik disiplinlerin entegrasyonu
Projede farklı teknolojilerin kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kapsam genişliği (bileşen sayısı vb.)
Projede farklı teknolojilerin kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	İlişkili teknik spesifikasyonlar

A	A, B'den daha önemli								Eşit önemli	B, A'dan daha önemli								B
	9	8	7	6	5	4	3	2		1	2	3	4	5	6	7	8	
Kullanılan teknolojilerin birbirleri ile ilişkili olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yaratıcılık gereksinimi
Kullanılan teknolojilerin birbirleri ile ilişkili olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı teknik disiplinlerin entegrasyonu
Kullanılan teknolojilerin birbirleri ile ilişkili olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kapsam genişliği (bileşen sayısı vb.)
Kullanılan teknolojilerin birbirleri ile ilişkili olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	İlişkili teknik spesifikasyonlar
Yaratıcılık gereksinimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı teknik disiplinlerin entegrasyonu
Yaratıcılık gereksinimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kapsam genişliği (bileşen sayısı vb.)
Yaratıcılık gereksinimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	İlişkili teknik spesifikasyonlar
Farklı teknik disiplinlerin entegrasyonu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kapsam genişliği (bileşen sayısı vb.)
Farklı teknik disiplinlerin entegrasyonu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	İlişkili teknik spesifikasyonlar
Kapsam genişliği (bileşen sayısı vb.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	İlişkili teknik spesifikasyonlar

1	Eşit önemli
3	Biraz önemli
5	Fazla önemli
7	Çok fazla önemli
9	Aşırı derece önemli
2,4,6,8	Ara değerler

Bu sayfada "Organizasyonel Konular" ana başlığı ile organizasyonun karar ve yetkisinde olan konuların (organizasyon tecrübesi, projedeki farklı departman sayıları, organizasyonun hedefleri vb.) kompleksite üzerindeki etkisini belirlemek amacı ile ikili karşılaştırmalar yapılmaktadır.

Aşağıdaki iki kriterden hangisi kompleksite açısından "Organizasyonel Konular" ana kriterini daha çok etkiler ve kaç kat daha çok etkiler?

A	A, B'den daha önemli									Eşit önemli	B, A'dan daha önemli									B
	9	8	7	6	5	4	3	2	1		2	3	4	5	6	7	8	9		
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ortak kaynak kullanan proje sayısı	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ile ilgili bölüm/departman sayısı	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kaç farklı amaç/hedef tanımlandığı	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yoğun öğrenme/bilgi ihtiyacı	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hiyerarşi seviyelerinin sayısı	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Çalışanların sayısı	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında kaç farklı karar alınacağı	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı bölümlerin birbirleri ile iletişimi	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tecrübe	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi kalifiye durumu	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel	
Proje ekibinin farklı fiziksel lokasyonlarda bulunması / sanal proje ekibi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar	
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ortak kaynak kullanan proje sayısı	
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ile ilgili bölüm/departman sayısı	
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi	
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kaç farklı amaç/hedef tanımlandığı	

A	A, B'den daha önemli								Eşit önemli	B, A'dan daha önemli								B
	9	8	7	6	5	4	3	2		1	2	3	4	5	6	7	8	
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yoğun öğrenme/bilgi ihtiyacı
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hiyerarşi seviyelerinin sayısı
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Çalışanların sayısı
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında kaç farklı karar alınacağı
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı bölümlerin birbirleri ile iletişimi
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tecrübe
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi kalifiye durumu
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel
Proje kapsamında kullanılan/kullanılacak kaynakların çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar
Ortak kaynak kullanan proje sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ile ilgili bölüm/departman sayısı
Ortak kaynak kullanan proje sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi
Ortak kaynak kullanan proje sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kaç farklı amaç/hedef tanımlandığı
Ortak kaynak kullanan proje sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yoğun öğrenme/bilgi ihtiyacı
Ortak kaynak kullanan proje sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hiyerarşi seviyelerinin sayısı
Ortak kaynak kullanan proje sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Çalışanların sayısı
Ortak kaynak kullanan proje sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında kaç farklı karar alınacağı
Ortak kaynak kullanan proje sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı bölümlerin birbirleri ile iletişimi
Ortak kaynak kullanan proje sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tecrübe
Ortak kaynak kullanan proje sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi kalifiye durumu
Ortak kaynak kullanan proje sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel
Ortak kaynak kullanan proje sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar
Proje ile ilgili bölüm/departman sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi
Proje ile ilgili bölüm/departman sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kaç farklı amaç/hedef tanımlandığı
Proje ile ilgili bölüm/departman sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yoğun öğrenme/bilgi ihtiyacı
Proje ile ilgili bölüm/departman sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hiyerarşi seviyelerinin sayısı
Proje ile ilgili bölüm/departman sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Çalışanların sayısı
Proje ile ilgili bölüm/departman sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında kaç farklı karar alınacağı
Proje ile ilgili bölüm/departman sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı bölümlerin birbirleri ile iletişimi
Proje ile ilgili bölüm/departman sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tecrübe
Proje ile ilgili bölüm/departman sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi kalifiye durumu
Proje ile ilgili bölüm/departman sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel
Proje ile ilgili bölüm/departman sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller

A	A, B'den daha önemli								Eşit önemli	B, A'dan daha önemli								B
	9	8	7	6	5	4	3	2		1	2	3	4	5	6	7	8	
Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kaç farklı amaç/hedef tanımlandığı
Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yoğun öğrenme/bilgi ihtiyacı
Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hiyerarşi seviyelerinin sayısı
Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Çalışanların sayısı
Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında kaç farklı karar alınacağı
Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı bölümlerin birbirleri ile iletişimi
Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tecrübe
Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi kalifiye durumu
Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel
Proje kapsamında uzak bir lokasyonda çalışmaların yürütülmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar
Kaç farklı amaç/hedef tanımlandığı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yoğun öğrenme/bilgi ihtiyacı
Kaç farklı amaç/hedef tanımlandığı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hiyerarşi seviyelerinin sayısı
Kaç farklı amaç/hedef tanımlandığı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Çalışanların sayısı
Kaç farklı amaç/hedef tanımlandığı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında kaç farklı karar alınacağı
Kaç farklı amaç/hedef tanımlandığı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı bölümlerin birbirleri ile iletişimi
Kaç farklı amaç/hedef tanımlandığı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tecrübe
Kaç farklı amaç/hedef tanımlandığı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi kalifiye durumu
Kaç farklı amaç/hedef tanımlandığı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel
Kaç farklı amaç/hedef tanımlandığı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar
Yoğun öğrenme/bilgi ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hiyerarşi seviyelerinin sayısı
Yoğun öğrenme/bilgi ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Çalışanların sayısı
Yoğun öğrenme/bilgi ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında kaç farklı karar alınacağı
Yoğun öğrenme/bilgi ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı bölümlerin birbirleri ile iletişimi
Yoğun öğrenme/bilgi ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tecrübe
Yoğun öğrenme/bilgi ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi kalifiye durumu
Yoğun öğrenme/bilgi ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel
Yoğun öğrenme/bilgi ihtiyacı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar

A	A, B'den daha önemli								Eşit önemli	B, A'dan daha önemli								B
	9	8	7	6	5	4	3	2		1	2	3	4	5	6	7	8	
Hiyerarşi seviyelerinin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Çalışanların sayısı
Hiyerarşi seviyelerinin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında kaç farklı karar alınacağı
Hiyerarşi seviyelerinin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı bölümlerin birbirleri ile iletişimi
Hiyerarşi seviyelerinin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TeCrübe
Hiyerarşi seviyelerinin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi kalifiye durumu
Hiyerarşi seviyelerinin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel
Hiyerarşi seviyelerinin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar
Çalışanların sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında kaç farklı karar alınacağı
Çalışanların sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı bölümlerin birbirleri ile iletişimi
Çalışanların sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TeCrübe
Çalışanların sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi kalifiye durumu
Çalışanların sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel
Çalışanların sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar
Proje kapsamında kaç farklı karar alınacağı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı bölümlerin birbirleri ile iletişimi
Proje kapsamında kaç farklı karar alınacağı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TeCrübe
Proje kapsamında kaç farklı karar alınacağı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi kalifiye durumu
Proje kapsamında kaç farklı karar alınacağı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel
Proje kapsamında kaç farklı karar alınacağı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar
Farklı bölümlerin birbirleri ile iletişimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TeCrübe
Farklı bölümlerin birbirleri ile iletişimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi kalifiye durumu
Farklı bölümlerin birbirleri ile iletişimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel
Farklı bölümlerin birbirleri ile iletişimi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar

A	A, B'den daha önemli								Eşit önemli	B, A'dan daha önemli								B
	9	8	7	6	5	4	3	2		1	2	3	4	5	6	7	8	
Tecrübe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi kalifiye durumu
Tecrübe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel
Tecrübe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar
Proje ekibi kalifiye durumu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Birden fazla proje ekibine atanan personel
Proje ekibi kalifiye durumu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar
Birden fazla proje ekibine atanan personel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Personel için net olarak tanımlanmamış roller ve sorumluluklar

1	Eşit önemli
3	Biraz önemli
5	Fazla önemli
7	Çok fazla önemli
9	Aşırı derece önemli
2,4,6,8	Ara değerler

Bu sayfada "Bağımlılıklar" ana başlığı ile birbiri ile ilişkili farklı konuların (ortak kaynak kullanımı, proje ekibi arasındaki işbirliği, projelerin birbirlerine etkisi vb.) kompleksite üzerindeki etkisini belirlemek amacı ile ikili karşılaştırmalar yapılmaktadır.

Aşağıdaki iki kriterden hangisi kompleksite açısından "Bağımlılıklar" ana kriterini daha çok etkiler ve kaç kat daha çok etkiler?

A	A, B'den daha önemli								Eşit önemli	B, A'dan daha önemli								B
	9	8	7	6	5	4	3	2		1	2	3	4	5	6	7	8	
Çevreye olan bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	İnsan, malzeme veya herhangi bir kaynağın ortak kullanımı
Çevreye olan bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lokasyonlar, departmanlar ve şirketler arasında bağımlılık
Çevreye olan bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ağı ve proje görevlerindeki ilişkiler ve geri besleme döngüleri
Çevreye olan bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi arasındaki işbirliği ve iletişim
Çevreye olan bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı gündemleri/programları olan insanların yönetilmesi
Çevreye olan bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje takvimlerinin birbirleri ile ilişkili olması
Çevreye olan bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projelerin birbirleri ile ilişkili amaç/hedeflerinin olması
Çevreye olan bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hükümet politikalarındaki projeyi etkileyen değişiklikler
Çevreye olan bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Müşterinin proje faaliyetlerine müdahalesi
Çevreye olan bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kültürel farklılıklar
Çevreye olan bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projede bir teslimatın farklı bir teslimatı etkilemesi
İnsan, malzeme veya herhangi bir kaynağın ortak kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lokasyonlar, departmanlar ve şirketler arasında bağımlılık
İnsan, malzeme veya herhangi bir kaynağın ortak kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ağı ve proje görevlerindeki ilişkiler ve geri besleme döngüleri
İnsan, malzeme veya herhangi bir kaynağın ortak kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje ekibi arasındaki işbirliği ve iletişim
İnsan, malzeme veya herhangi bir kaynağın ortak kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı gündemleri/programları olan insanların yönetilmesi
İnsan, malzeme veya herhangi bir kaynağın ortak kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje takvimlerinin birbirleri ile ilişkili olması
İnsan, malzeme veya herhangi bir kaynağın ortak kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projelerin birbirleri ile ilişkili amaç/hedeflerinin olması
İnsan, malzeme veya herhangi bir kaynağın ortak kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hükümet politikalarındaki projeyi etkileyen değişiklikler
İnsan, malzeme veya herhangi bir kaynağın ortak kullanımı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Müşterinin proje faaliyetlerine müdahalesi

A	A, B'den daha önemli								Eşit önemli	B, A'dan daha önemli									B
	9	8	7	6	5	4	3	2		1	2	3	4	5	6	7	8	9	
Proje ekibi arasındaki işbirliği ve iletişim	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Farklı gündemleri/programları olan insanların yönetilmesi
Proje ekibi arasındaki işbirliği ve iletişim	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje takvimlerinin birbirleri ile ilişkili olması
Proje ekibi arasındaki işbirliği ve iletişim	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projelerin birbirleri ile ilişkili amaç/hedeflerinin olması
Proje ekibi arasındaki işbirliği ve iletişim	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hükümet politikalarındaki projeyi etkileyen değişiklikler
Proje ekibi arasındaki işbirliği ve iletişim	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Müşterinin proje faaliyetlerine müdahalesi
Proje ekibi arasındaki işbirliği ve iletişim	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kültürel farklılıklar
Proje ekibi arasındaki işbirliği ve iletişim	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projede bir teslimatın farklı bir teslimatı etkilemesi
Farklı gündemleri/programları olan insanların yönetilmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje takvimlerinin birbirleri ile ilişkili olması
Farklı gündemleri/programları olan insanların yönetilmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projelerin birbirleri ile ilişkili amaç/hedeflerinin olması
Farklı gündemleri/programları olan insanların yönetilmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hükümet politikalarındaki projeyi etkileyen değişiklikler
Farklı gündemleri/programları olan insanların yönetilmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Müşterinin proje faaliyetlerine müdahalesi
Farklı gündemleri/programları olan insanların yönetilmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kültürel farklılıklar
Farklı gündemleri/programları olan insanların yönetilmesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projede bir teslimatın farklı bir teslimatı etkilemesi
Proje takvimlerinin birbirleri ile ilişkili olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projelerin birbirleri ile ilişkili amaç/hedeflerinin olması
Proje takvimlerinin birbirleri ile ilişkili olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hükümet politikalarındaki projeyi etkileyen değişiklikler
Proje takvimlerinin birbirleri ile ilişkili olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Müşterinin proje faaliyetlerine müdahalesi
Proje takvimlerinin birbirleri ile ilişkili olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kültürel farklılıklar
Proje takvimlerinin birbirleri ile ilişkili olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projede bir teslimatın farklı bir teslimatı etkilemesi
Projelerin birbirleri ile ilişkili amaç/hedeflerinin olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hükümet politikalarındaki projeyi etkileyen değişiklikler
Projelerin birbirleri ile ilişkili amaç/hedeflerinin olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Müşterinin proje faaliyetlerine müdahalesi
Projelerin birbirleri ile ilişkili amaç/hedeflerinin olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kültürel farklılıklar
Projelerin birbirleri ile ilişkili amaç/hedeflerinin olması	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projede bir teslimatın farklı bir teslimatı etkilemesi

A	A, B'den daha önemli								Eşit önemli	B, A'dan daha önemli								B
	9	8	7	6	5	4	3	2		1	2	3	4	5	6	7	8	
Hükümet politikalarındaki projeyi etkileyen değişiklikler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Müşterinin proje faaliyetlerine müdahalesi
Hükümet politikalarındaki projeyi etkileyen değişiklikler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kültürel farklılıklar
Hükümet politikalarındaki projeyi etkileyen değişiklikler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projede bir teslimatın farklı bir teslimatı etkilemesi
Müşterinin proje faaliyetlerine müdahalesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kültürel farklılıklar
Müşterinin proje faaliyetlerine müdahalesi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projede bir teslimatın farklı bir teslimatı etkilemesi
Kültürel farklılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Projede bir teslimatın farklı bir teslimatı etkilemesi

1	Eşit önemli
3	Biraz önemli
5	Fazla önemli
7	Çok fazla önemli
9	Aşırı derece önemli
2,4,6,8	Ara değerler

Bu sayfada "Proje Yapısından Kaynaklı Konular" ana başlığı ile direkt olarak proje ile ilgili özelliklerin (proje süresi, teslimat adedi vb.) kompleksite üzerindeki etkisini belirlemek amacı ile ikili karşılaştırmalar yapılmaktadır.

Aşağıdaki iki kriterden hangisi kompleksite açısından "Proje Yapısından Kaynaklı Konular" ana kriterini daha çok etkiler ve kaç kat daha çok etkiler?

A	A, B'den daha önemli								Eşit önemli	B, A'dan daha önemli								B
	9	8	7	6	5	4	3	2		1	2	3	4	5	6	7	8	
Teslimat adedi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamında tanımlı aktivitelerin sayısı
Teslimat adedi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje süresi
Teslimat adedi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gerçekçi olmayan teslimat takvimleri
Teslimat adedi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Zamanında tanımlanamayan kilit riskler
Teslimat adedi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamını/takvimini sağlayamayan satınalma işlemleri
Teslimat adedi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje fazları arasındaki bağımlılıklar
Teslimat adedi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Paydaş sayısı ve çeşitliliği
Teslimat adedi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Finansman kaynaklarının çeşitliliği
Proje kapsamında tanımlı aktivitelerin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje süresi
Proje kapsamında tanımlı aktivitelerin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gerçekçi olmayan teslimat takvimleri
Proje kapsamında tanımlı aktivitelerin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Zamanında tanımlanamayan kilit riskler
Proje kapsamında tanımlı aktivitelerin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamını/takvimini sağlayamayan satınalma işlemleri
Proje kapsamında tanımlı aktivitelerin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje fazları arasındaki bağımlılıklar
Proje kapsamında tanımlı aktivitelerin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Paydaş sayısı ve çeşitliliği
Proje kapsamında tanımlı aktivitelerin sayısı	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Finansman kaynaklarının çeşitliliği
Proje süresi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gerçekçi olmayan teslimat takvimleri
Proje süresi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Zamanında tanımlanamayan kilit riskler
Proje süresi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamını/takvimini sağlayamayan satınalma işlemleri

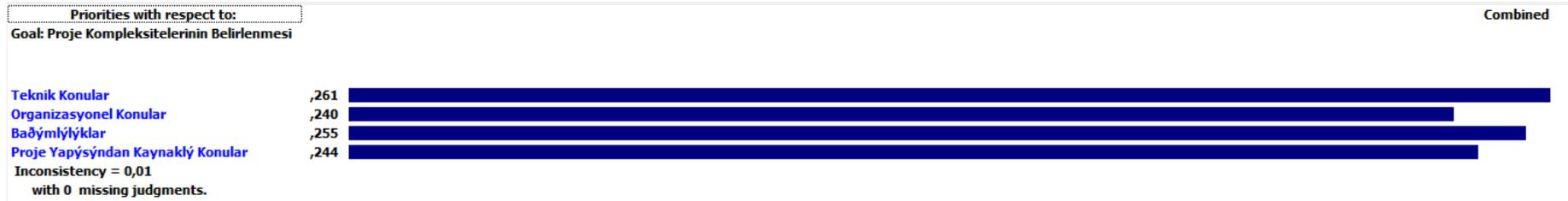
A	A, B'den daha önemli									Eşit önemli	B, A'dan daha önemli									B
	9	8	7	6	5	4	3	2	1		2	3	4	5	6	7	8	9		
Proje süresi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje fazları arasındaki bağımlılıklar		
Proje süresi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Paydaş sayısı ve çeşitliliği		
Proje süresi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Finansman kaynaklarının çeşitliliği		
Gerçekçi olmayan teslimat takvimleri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Zamanında tanımlanamayan kilit riskler		
Gerçekçi olmayan teslimat takvimleri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamını/takvimini sağlayamayan satınalma işlemleri		
Gerçekçi olmayan teslimat takvimleri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje fazları arasındaki bağımlılıklar		
Gerçekçi olmayan teslimat takvimleri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Paydaş sayısı ve çeşitliliği		
Gerçekçi olmayan teslimat takvimleri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Finansman kaynaklarının çeşitliliği		
Zamanında tanımlanamayan kilit riskler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje kapsamını/takvimini sağlayamayan satınalma işlemleri		
Zamanında tanımlanamayan kilit riskler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje fazları arasındaki bağımlılıklar		
Zamanında tanımlanamayan kilit riskler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Paydaş sayısı ve çeşitliliği		
Zamanında tanımlanamayan kilit riskler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Finansman kaynaklarının çeşitliliği		
Proje kapsamını/takvimini sağlayamayan satınalma işlemleri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proje fazları arasındaki bağımlılıklar		
Proje kapsamını/takvimini sağlayamayan satınalma işlemleri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Paydaş sayısı ve çeşitliliği		
Proje kapsamını/takvimini sağlayamayan satınalma işlemleri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Finansman kaynaklarının çeşitliliği		
Proje fazları arasındaki bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Paydaş sayısı ve çeşitliliği		
Proje fazları arasındaki bağımlılıklar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Finansman kaynaklarının çeşitliliği		
Paydaş sayısı ve çeşitliliği	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Finansman kaynaklarının çeşitliliği		

3	Biraz önemli
5	Fazla önemli
7	Çok fazla önemli
9	Aşırı derece önemli
2,4,6,8	Ara değerler

APPENDIX C

Expert Choice Outputs

Expert Choice output corresponding to main factors/criteria



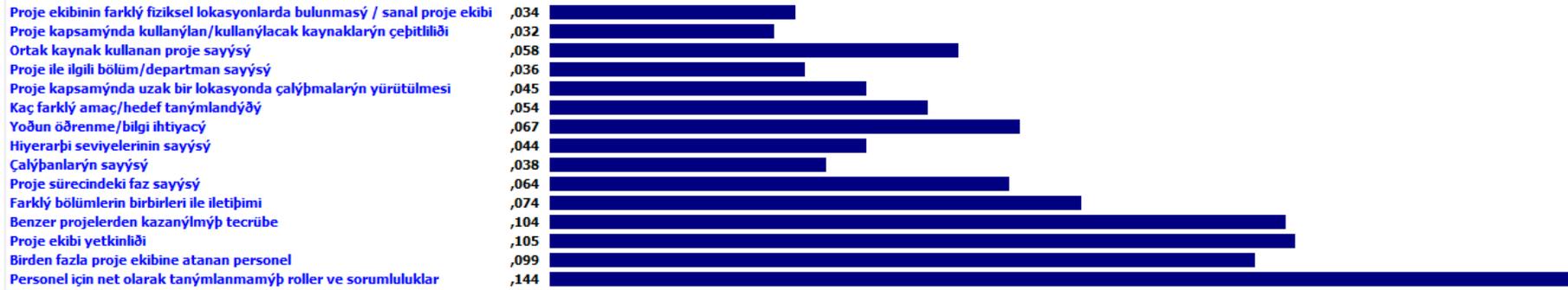
101

Expert Choice output corresponding to “Technical Issues”



Expert Choice output corresponding to “Organizational Issues”

Goal: Proje Kompleksitelerinin Belirlenmesi
>Organizasyonel Konular

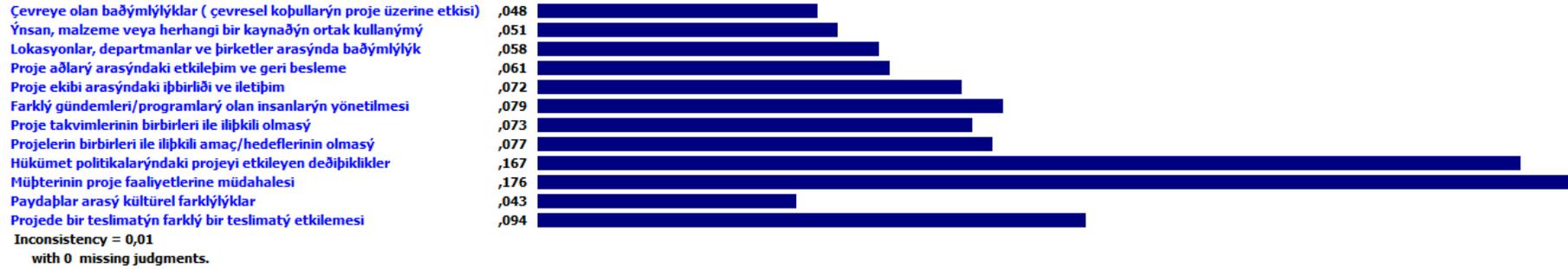


Inconsistency = 0,00605
with 0 missing judgments.

Expert Choice output corresponding to “Interdependencies”

Combined

Priorities with respect to:
 Goal: Proje Kompleksitelerinin Belirlenmesi
 >Bađymlylyklar

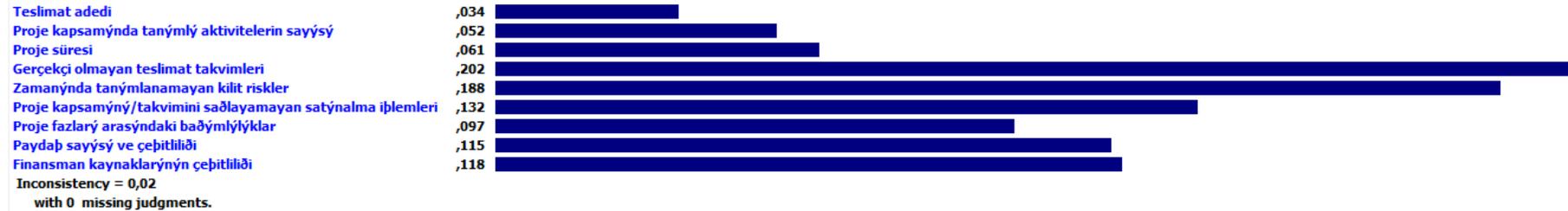


103

Expert Choice output corresponding to “Structural Issues”

Combined

Priorities with respect to:
 Goal: Proje Kompleksitelerinin Belirlenmesi
 >Proje Yapısından Kaynaklı Konular



APPENDIX D

Complexity values of projects obtained from Expert Choice

Proje	Kompleksite	Proje	Kompleksite
Project_4	0,064	Project_1	0,021
Project_8	0,054	Project_12	0,021
Project_25	0,05	Project_16	0,021
Project_3	0,049	Project_18	0,02
Project_21	0,047	Project_23	0,02
Project_15	0,046	Project_27	0,02
Project_24	0,046	Project_29	0,02
Project_26	0,04	Project_13	0,019
Project_11	0,039	Project_28	0,019
Project_20	0,039	Project_31	0,017
Project_5	0,036	Project_32	0,017
Project_14	0,031	Project_10	0,016
Project_7	0,028	Project_22	0,016
Project_6	0,027	Project_33	0,016
Project_9	0,027	Project_34	0,016
Project_30	0,024	Project_2	0,015
Project_17	0,022	Project_35	0,015
Project_19	0,022		

APPENDIX E

Normality Tests on Projects' Relative Complexities

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Project_Complexity	35	100,0%	0	0,0%	35	100,0%

Descriptives

		Statistic	Std. Error
Project_Complexity	Mean	,4463	,03557
	95% Confidence Interval for Mean		
	Lower Bound	,3740	
	Upper Bound	,5186	
	5% Trimmed Mean	,4313	
	Median	,3400	
	Variance	,044	
	Std. Deviation	,21042	
	Minimum	,23	
	Maximum	1,00	
	Range	,77	
	Interquartile Range	,31	
	Skewness	,994	,398
	Kurtosis	-,112	,778

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Project_Complexity	,236	35	,000	,853	35	,000

a. Lilliefors Significance Correction

APPENDIX F

Normality Test of Weighted Scores Obtained From Complex Projects

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Weighted_scores_of_compl ex_projects	16	100,0%	0	0,0%	16	100,0%

Descriptives

		Statistic	Std. Error	
Weighted_scores_of_compl ex_projects	Mean	-,1471	,02726	
	95% Confidence Interval for Mean	Lower Bound	-,2052	
		Upper Bound	-,0890	
	5% Trimmed Mean	-,1416		
	Median	-,1094		
	Variance	,012		
	Std. Deviation	,10904		
	Minimum	-,37		
	Maximum	-,02		
	Range	,35		
	Interquartile Range	,12		
	Skewness	-1,126	,564	
	Kurtosis	,213	1,091	

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Weighted_scores_of_compl ex_projects	,190	16	,125	,856	16	,017

a. Lilliefors Significance Correction

APPENDIX G

Normality Test of Weighted Scores Obtained From Noncomplex Projects

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Weighted_scores_of_noncomplex_projects	19	100,0%	0	0,0%	19	100,0%

Descriptives

			Statistic	Std. Error
Weighted_scores_of_noncomplex_projects	Mean		-,1347	,02344
	95% Confidence Interval for Mean	Lower Bound	-,1839	
		Upper Bound	-,0854	
	5% Trimmed Mean		-,1231	
	Median		-,0939	
	Variance		,010	
	Std. Deviation		,10216	
	Minimum		-,43	
	Maximum		-,04	
	Range		,39	
	Interquartile Range		,08	
	Skewness		-1,919	,524
	Kurtosis		3,360	1,014

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Weighted_scores_of_noncomplex_projects	,249	19	,003	,751	19	,000

a. Lilliefors Significance Correction

APPENDIX H

Written Permission received from Gary Yukl and Managerial Practices Survey

questionnaire about leadership

Gelen Kutusu x



Fevziye Bilgiç <bilgicfevziye@gmail.com>

10 07 2014 ☆



Alıcı: g.yukl

Dear Gary,

I'm an MS student in Industrial Engineering at Middle East Technical University, Turkey. I'm writing my thesis and it is about "Leadership competency profiles to be a successful project manager in complex project management environment."

I can summarize my thesis as:

To ensure complex project management environment, projects that are executed in a company in the field of defense will be analyzed based on complexity factors that are mentioned in literature. By using Analytic Hierarchy Process (AHP), the relative complexity of the projects will be measured. Then, projects were grouped as complex or not.

The competency profiles of the leaders to be successful in the complex projects will be achieved after applying a questionnaire and finally by taking into account the project performance measure of the corresponding projects the required competency profiles for leaders were achieved.

However, I need a questionnaire about leadership style. I know you are many articles and works about this issue. Could you please offer a questionnaire to use in my thesis? It is used only in my thesis for academic purpose, there will be no commercial usage. Your suggestions will be valuable for me.

Thank you in advance,

Fevziye YILMAZ

905558328325



Yukl, Gary A <gyukl@albany.edu>

10 07 2014 ☆



Alıcı: bana



İngilizce > Türkçe İletiyi çevir

İngilizce için kapat x

The MPS is described in the attached file. If you want to use it, let me know.



Fevziye Bilgiç <bilgicfevziye@gmail.com>

11 07 2014 ☆



Alıcı: Gary

Dear Gary,

First of all, thank you for your rapid response. I think, I can use it in my thesis. Could you please share it? As I said before, it is not used any commercial purpose, it will be used only for my thesis in MS program.

Thank you for your support,

Fevziye

...



Yukl, Gary A <gyukl@albany.edu>

11 07 2014 ☆



Alıcı: bana



İngilizce > Türkçe İletiyi çevir

İngilizce için kapat x

The MPS version G-15 is attached. In any research reports please show only the scale definitions and no more than one sample item for each scale.

Managerial Practices Survey with sample item under each behavior

MPS G-15-4

Instructions: Please describe how much your boss uses each managerial practice or leadership behavior. The term "unit" refers to the team, department, division, or company for which your boss is the designated leader, and the term "members" refers to the people who report directly to your boss. Think about each type of behavior separately, and do not allow your general evaluation of the manager to bias your answers about specific behaviors. For each item, select one of the following response choices and write the number or code for it on the line provided.

- 5 To a Very great extent
- 4 To a Considerable extent
- 3 To a Moderate extent
- 2 To a Limited extent
- 1 Not at all, or Not applicable

Clarifying

___ Clearly explains the job responsibilities and task assignments of members

Supporting

___ Shows concern for the needs and feelings of individual members of the work unit

Envisioning

___ Describes a proposed change or new initiative with enthusiasm and optimism

External Monitoring

___ Uses social networks and contacts with outsiders to get useful information

Planning Activities

___ Develops short-term plans for accomplishing the work unit's tasks

Recognizing

___ Praises effective performance by members of the work unit

Encouraging Innovation

___ Encourages innovative thinking and creative solutions to problems

Representing

___ Promotes a favorable image for the work unit with superiors and outsiders

Monitoring Operations

___ Checks on the progress and quality of the work

Developing Member Skills

___ Provides helpful feedback and coaching to members who need it

Encouraging Collective Learning

___ Looks for ways to adapt best practices used by other work units or organizations

Networking

___ Attends social and professional events to meet people with useful information

Problem Solving

___ Recognizes the early stage of a problem that is likely to disrupt the work

Empowering

___ Encourages members to take responsibility for determining how to do their work

Advocating Change

___ Explains why changes are necessary to deal with an emerging threat or opportunity

Her liderlik davranışı için bir örnek anket sorusu ile Yönetmel Uygulama Anketi

Açıklamalar: Bu ankette yöneticinizin her bir yönetmel uygulama ve liderlik özelliklerini ne kadar kullandığını tanımlamanız beklenmektedir. Ankette "Birim" yöneticinizin lider olduğu ekip, birim, bölüm ya da şirketi; "çalışanlar" ise yöneticinize doğrudan bağlı olup, rapor veren kişileri ifade eder. Yöneticinizi değerlendirirken her bir davranış şeklini ayrı ayrı düşünmeniz ve bazı özel durumlar için önyargılarınızın genel değerlendirmeleri etkilemesine izin vermemeniz beklenmektedir. Her bir madde için aşağıda açıklamaları verilen seçeneklerden birini seçerek, solda verilen alana seçtiğiniz seçeneği ifade eden sayıyı yazınız.

- 5 Çok önemli ölçüde
- 4 Kayda değer ölçüde
- 3 Orta ölçüde
- 2 Sınırlı ölçüde
- 1 Hiç ya da uygun değil

Aydınlatma

___ Çalışanların işle ilgili sorumluluklarını ve görevlendirmelerini net bir şekilde

Destekleme

___ Birimin her bir çalışanın duygu ve ihtiyaçları ile ilgilenir.

Öngörü

___ Önerilen bir değişikliği veya yeni bir girişimi iyimserlik ve coşku ile ifade eder.

Dış Dünyayı izleme

___ 13. Sosyal ağları ve üçüncü şahısları yararlı bilgiler edinmek için kullanır.

Planlama

___ İş biriminin görevlerini başarıyla yerine getirmesi için kısa vadeli planlar geliştirir.

Takdir/tanım

___ Birim çalışanlarının etkili performanslarını takdir eder.

Yenilikçiliğin teşviki

___ İnovatif düşüncüyü ve problemlere yaratıcı sonuçlar sunmayı teşvik eder.

Temsil etme

___ Üstlere ve yabancılara karşı iş birimi için olumlu bir imaj oluşturacak şekilde tanıtım yapar.

Operasyonları izleme

___ İşin kalitesini ve gelişimini kontrol eder.

Çalışan yeteneklerini geliştirme

___ İhtiyacı olan çalışanlara faydalı geri dönüşler ve danışmanlık sağlar.

Birlikte öğrenmeyi destekleme

___ Diğer iş birimlerinin veya organizasyonların kullandığı en iyi uygulamaların kendi birimine uyarlanmasının yollarını arar.

Sosyal ağ oluşturma

___ Yararlı bilgiler edinebileceği insanlarla görüşmek için, düzenlenen sosyal ve mesleki etkinliklere katılır.

Problem çözme

___ İşi olumsuz yönde etkileyebilecek bir problemi erken evrede tanır.

Yetkilendirme

___ Çalışanları kendi işlerini nasıl yapacaklarını belirlemeleri konusunda teşvik eder.

Değişimi Savunma

___ Ortaya çıkan bir tehdit veya fırsatla başa çıkmak için değişikliklerin neden gerekli olduğunu açıklar.

APPENDIX I

Reliability Analysis of MPS Data

For task-oriented leadership style:

Case Processing Summary

		N	%
Cases	Valid	105	100,0
	Excluded ^a	0	,0
	Total	105	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,901	,903	16

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3,605	3,219	4,019	,800	1,249	,045	16
Item Variances	,812	,629	1,167	,538	1,856	,016	16

For relations-oriented leadership style:

Case Processing Summary

		N	%
Cases	Valid	105	100,0
	Excluded ^a	0	,0
	Total	105	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,878	,877	16

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3,417	3,162	3,686	,524	1,166	,025	16
Item Variances	,820	,678	1,067	,389	1,574	,010	16

For change-oriented leadership style:

Case Processing Summary

		N	%
Cases	Valid	105	100,0
	Excluded ^a	0	,0
	Total	105	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,879	,879	16

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3,132	2,800	3,467	,667	1,238	,043	16
Item Variances	,895	,718	1,274	,557	1,776	,025	16

For external leadership style:

Case Processing Summary

		N	%
Cases	Valid	105	100,0
	Excluded ^a	0	,0
	Total	105	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,835	,836	12

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3,432	3,286	3,552	,267	1,081	,009	12
Item Variances	,666	,483	,956	,473	1,980	,024	12

APPENDIX J

Nonparametric Test Results across leadership styles for complex projects in the case of performance based classification

Two groups are defined for the application of Mann-Whitney U Test; “1.000” is for high performance complex projects, “2.000” is for low performance complex projects. The test results obtained from SPSS are given in below:

Task Oriented Leadership Style:

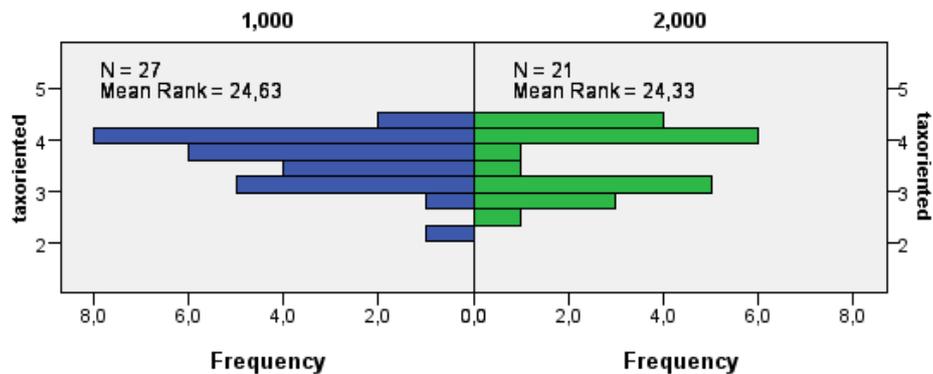
Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of taxoriented is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,942	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Independent-Samples Mann-Whitney U Test

Performance



Relations Oriented Leadership Style:

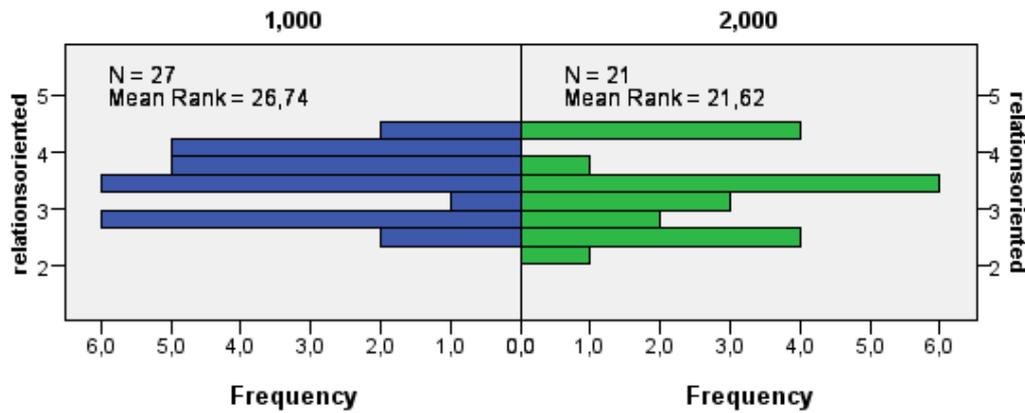
Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of relationsoriented is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,208	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Independent-Samples Mann-Whitney U Test

Performance



Change Oriented Leadership Style:

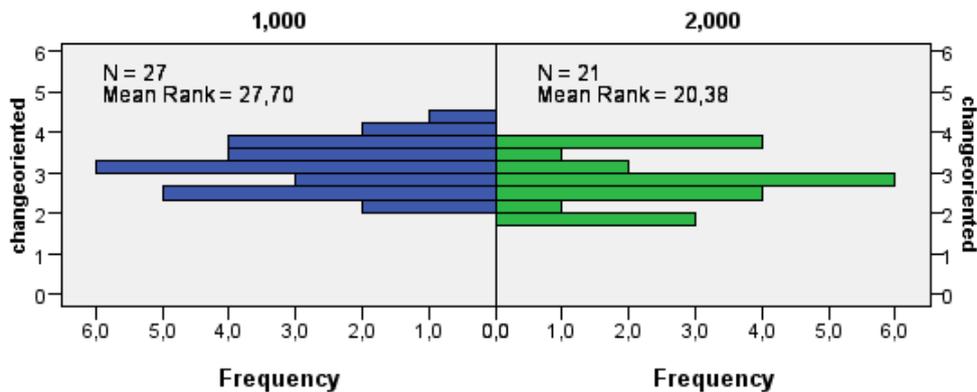
Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of changeoriented is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,072	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Independent-Samples Mann-Whitney U Test

Performance



External Leadership Style:

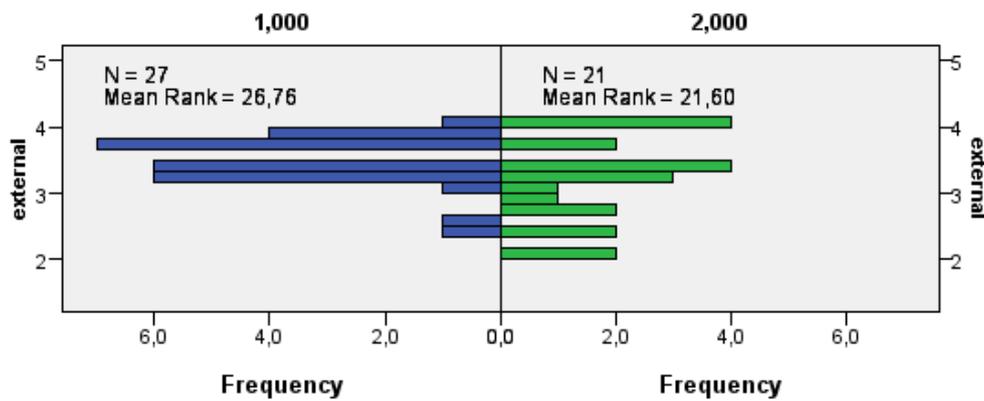
Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of external is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,204	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Independent-Samples Mann-Whitney U Test

Performance



APPENDIX K

Nonparametric Test Results of Leadership Behaviors for Complex Projects in the case of performance based classification

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Aydınlatma is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,414	Retain the null hypothesis.
2	The distribution of Destekleme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,341	Retain the null hypothesis.
3	The distribution of Öngörü is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,024	Reject the null hypothesis.
4	The distribution of DışDünya is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,052	Retain the null hypothesis.
5	The distribution of Planlama is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,874	Retain the null hypothesis.
6	The distribution of TakdirTanımı is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,424	Retain the null hypothesis.
7	The distribution of Yenilikçilik is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,158	Retain the null hypothesis.
8	The distribution of TemsilEtme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,671	Retain the null hypothesis.
9	The distribution of Operasyonları İzleme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,174	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
10	The distribution of Çalışan_Geliştirme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,252	Retain the null hypothesis.
11	The distribution of Birlikte_Öğrenme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,110	Retain the null hypothesis.
12	The distribution of Sosyal_Ağ is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,283	Retain the null hypothesis.
13	The distribution of Problem_Çözme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,585	Retain the null hypothesis.
14	The distribution of Yetkilendirme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,323	Retain the null hypothesis.
15	The distribution of Değişim is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,808	Retain the null hypothesis.

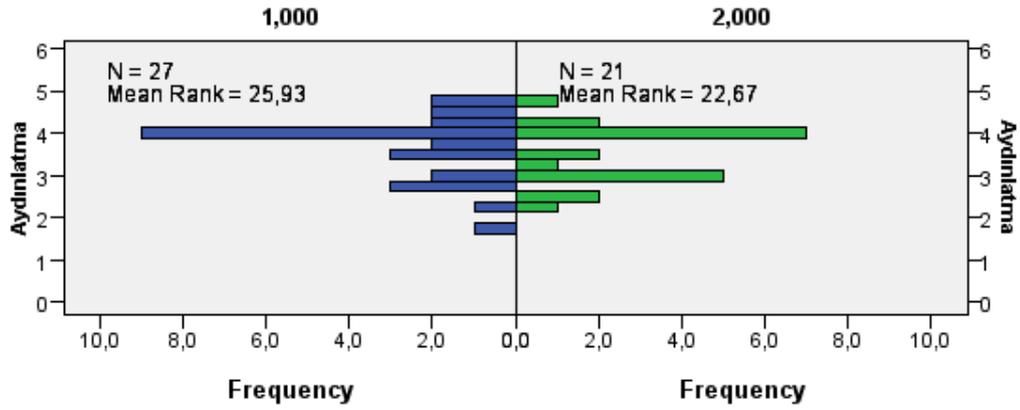
Asymptotic significances are displayed. The significance level is ,05.

Two groups are defined for the application of Mann-Whitney U Test; “1.000” is for high performance complex projects, “2.000” is for low performance complex projects. The test results obtained from SPSS are given in below:

Clarifying :

Independent-Samples Mann-Whitney U Test

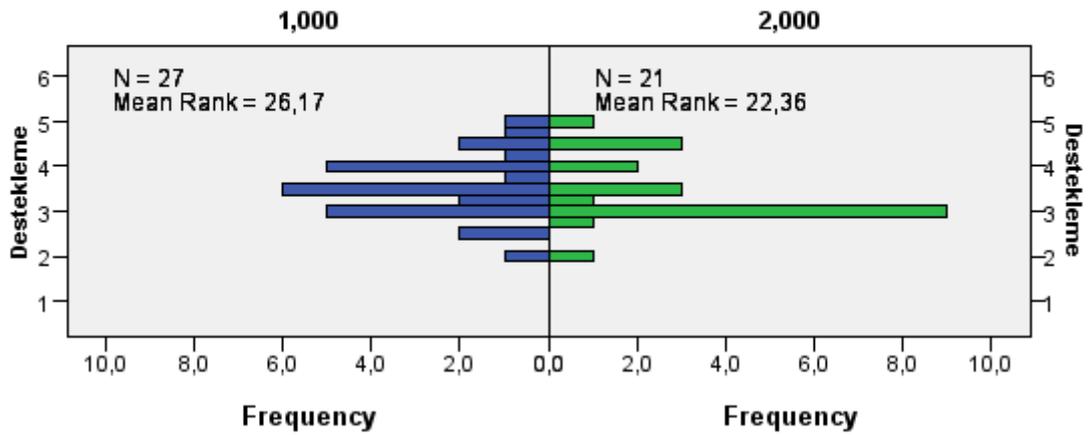
Performance



Supporting:

Independent-Samples Mann-Whitney U Test

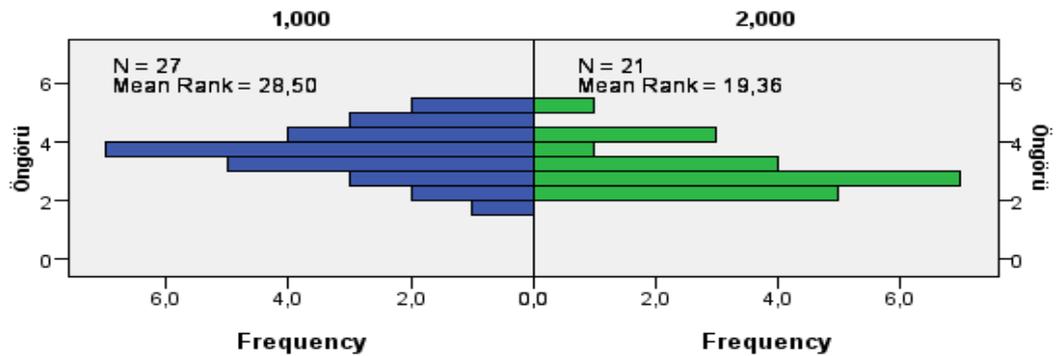
Performance



Envisioning Change:

Independent-Samples Mann-Whitney U Test

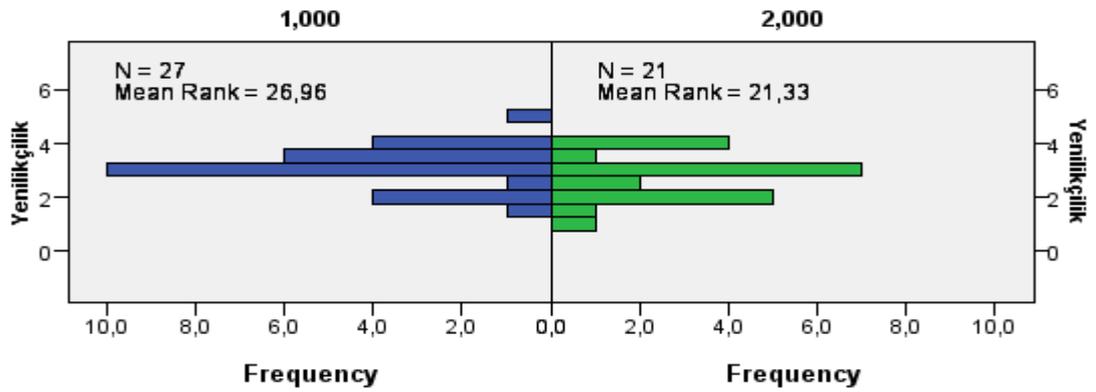
Performance



Encouraging Innovation:

Independent-Samples Mann-Whitney U Test

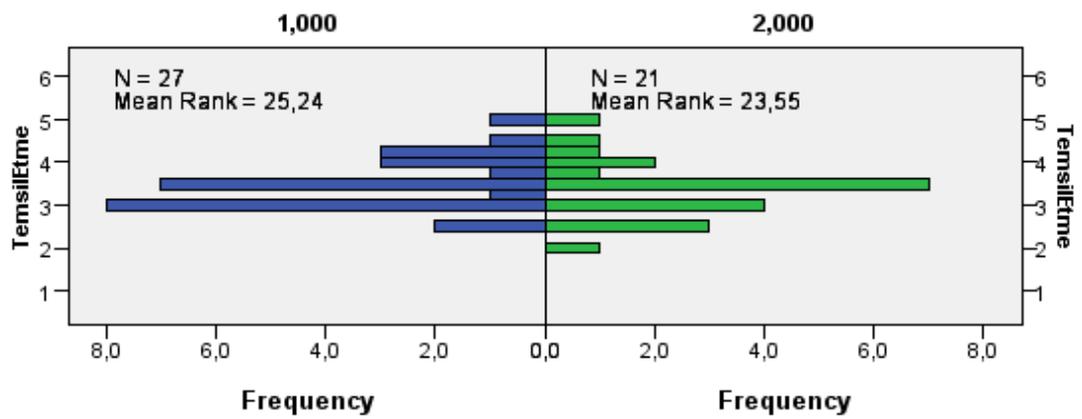
Performance



Representing:

Independent-Samples Mann-Whitney U Test

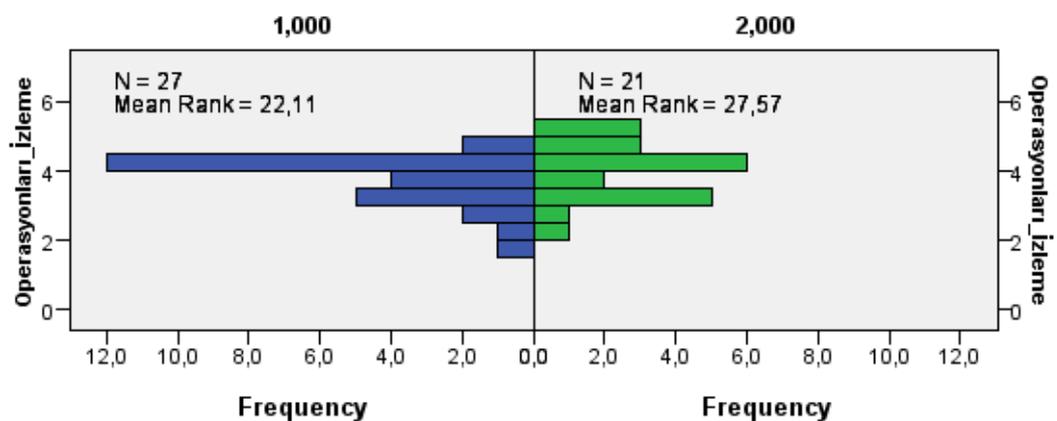
Performance



Monitorig Operations :

Independent-Samples Mann-Whitney U Test

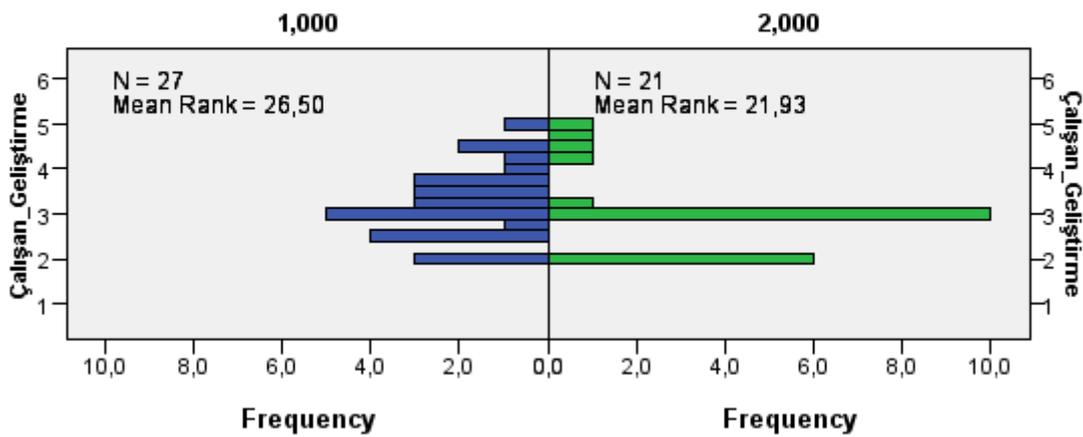
Performance



Developing Member Skills:

Independent-Samples Mann-Whitney U Test

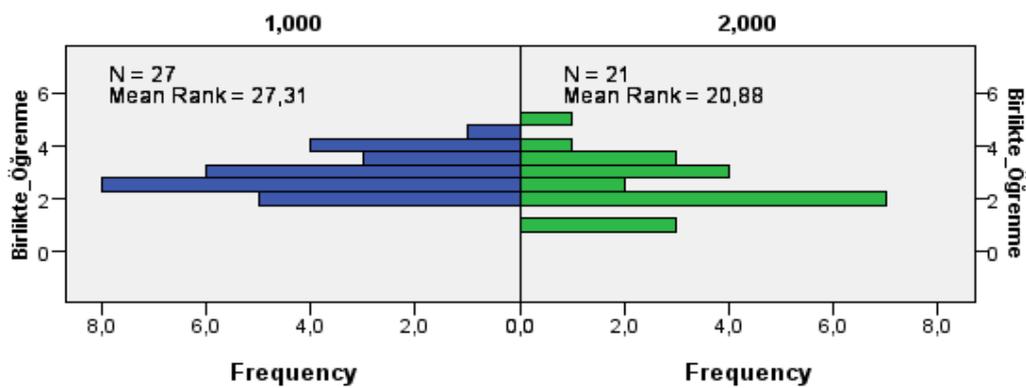
Performance



Facilitating Collective Learning:

Independent-Samples Mann-Whitney U Test

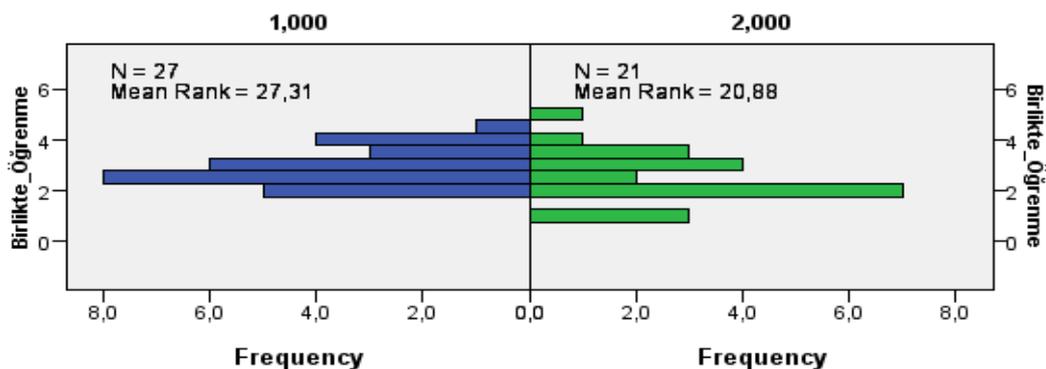
Performance



Networking:

Independent-Samples Mann-Whitney U Test

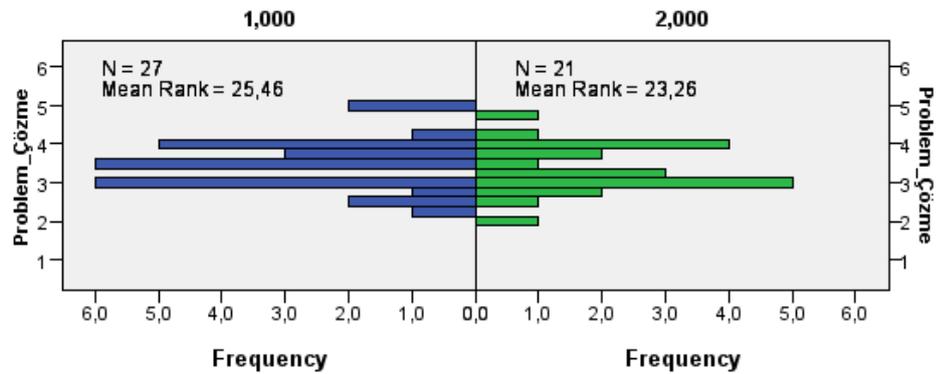
Performance



Problem Solving:

Independent-Samples Mann-Whitney U Test

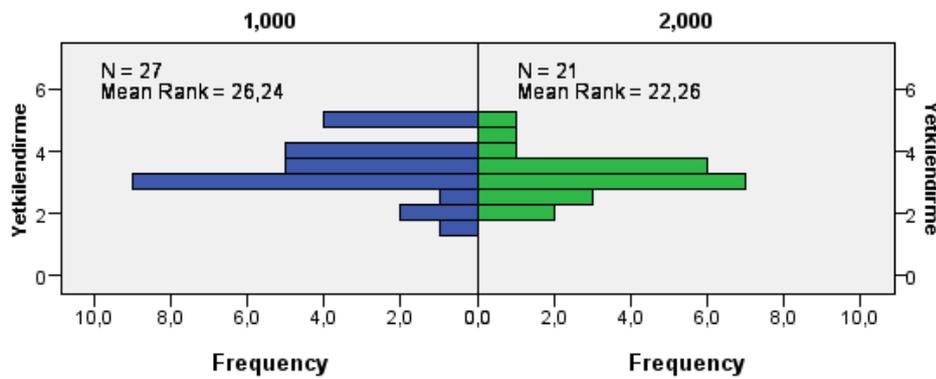
Performance



Empowering :

Independent-Samples Mann-Whitney U Test

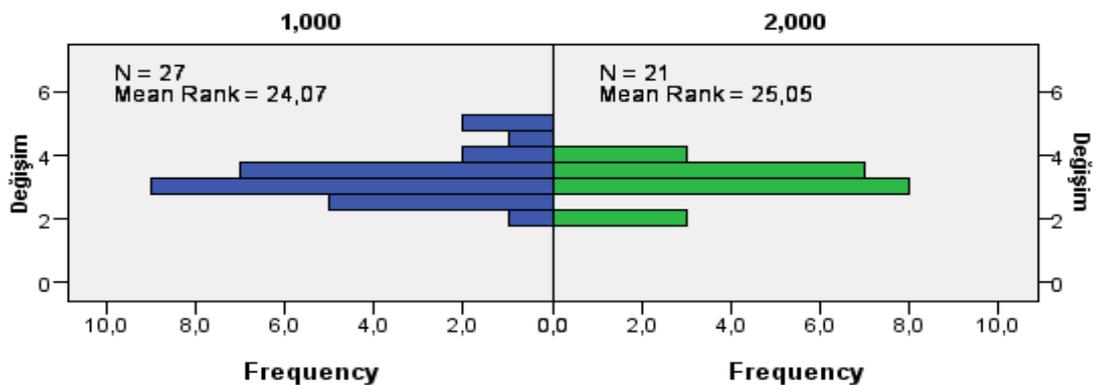
Performance



Advocating Change:

Independent-Samples Mann-Whitney U Test

Performance



APPENDIX L

Nonparametric Test Results across leadership styles for noncomplex projects in the case of performance based classification

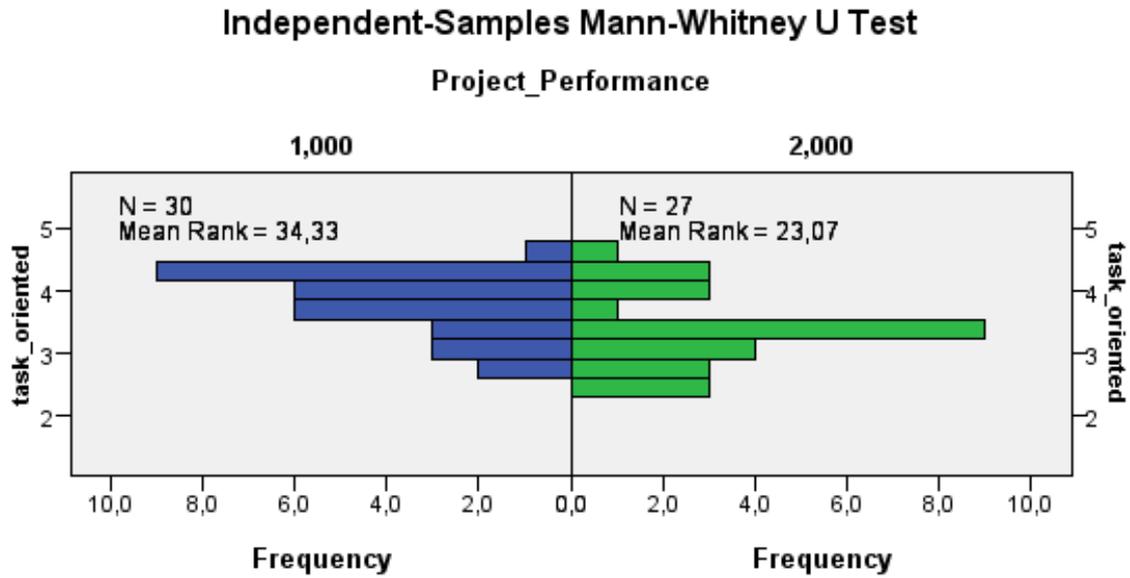
Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of task_oriented is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,010	Reject the null hypothesis.
2	The distribution of change_oriented is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,016	Reject the null hypothesis.
3	The distribution of relations_oriented is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,329	Retain the null hypothesis.
4	The distribution of external is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,000	Reject the null hypothesis.

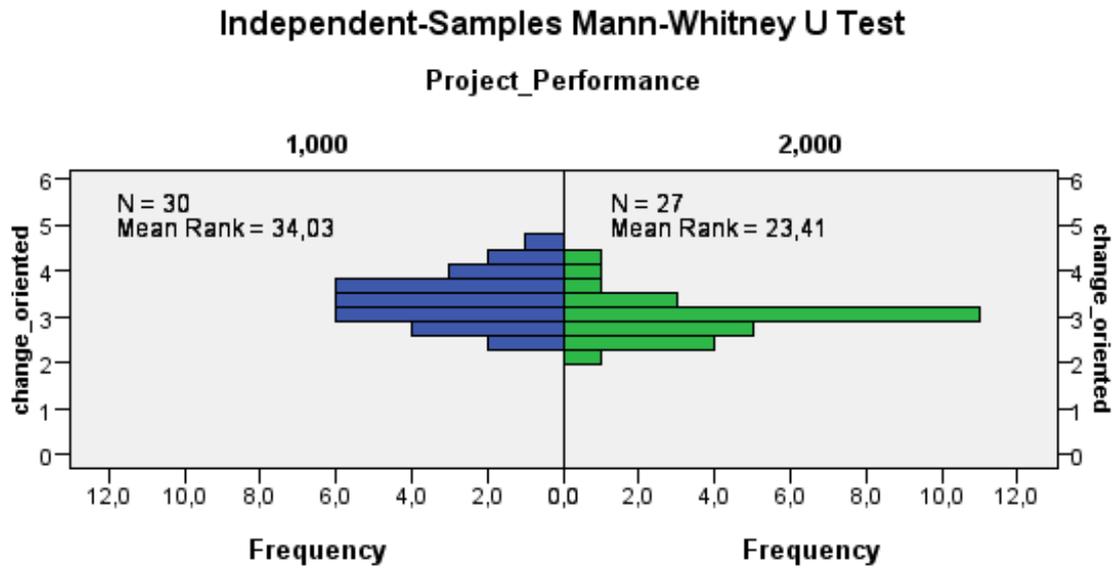
Asymptotic significances are displayed. The significance level is ,05.

Two groups are defined for the application of Mann-Whitney U Test; “1.000” is for high performance noncomplex projects, “2.000” is for low performance noncomplex projects. The test results obtained from SPSS are given in below:

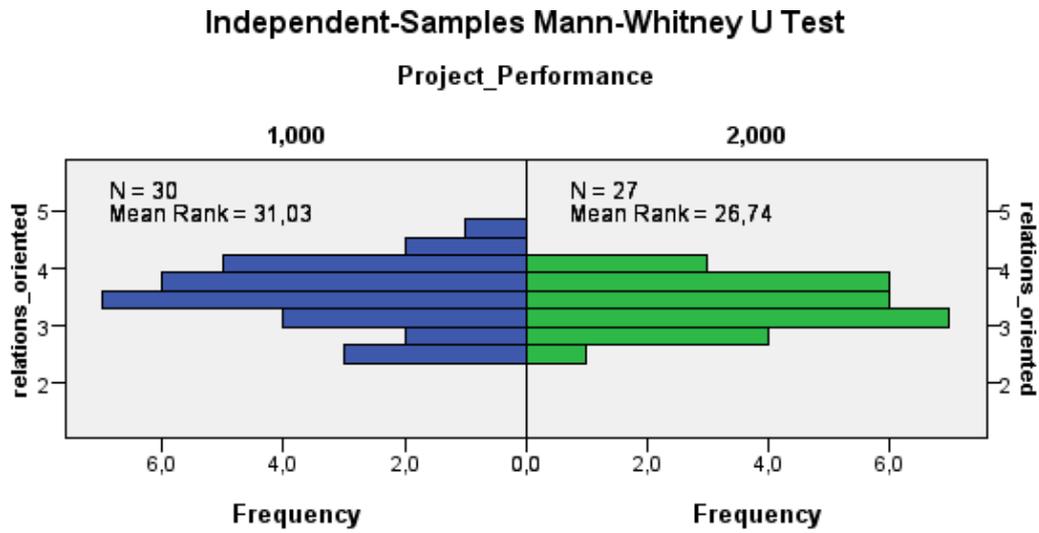
Task Oriented Leadership style:



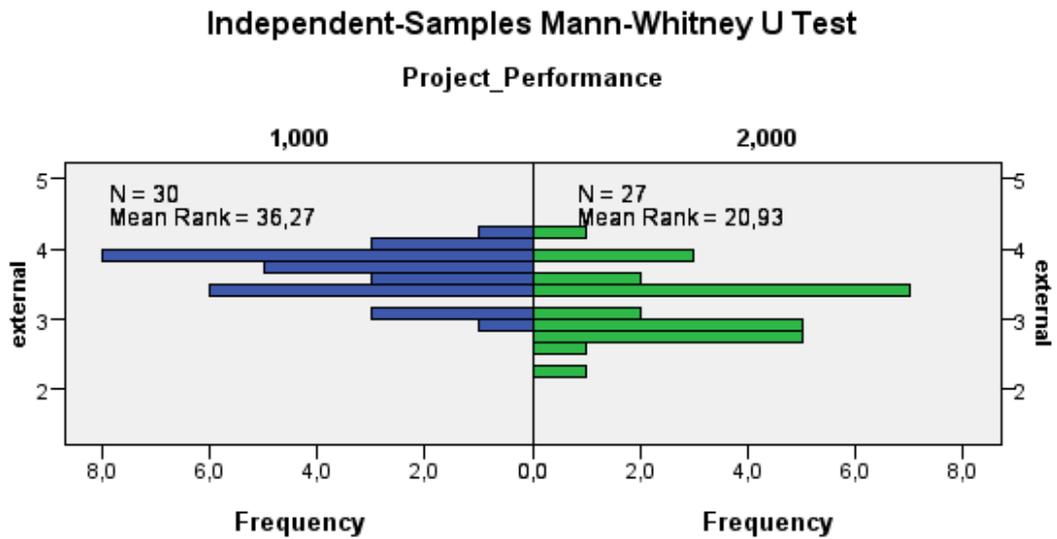
Change Oriented Leadership Style:



Relations oriented Leadership Style:



External Leadership Style:



APPENDIX M

Nonparametric Test Results of Leadership Behaviors for Noncomplex Projects in the case of performance based classification

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Aydınlatma is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,000	Reject the null hypothesis.
2	The distribution of Destekleme is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,342	Retain the null hypothesis.
3	The distribution of Öngörü is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,280	Retain the null hypothesis.
4	The distribution of Dış_Dünya is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,012	Reject the null hypothesis.
5	The distribution of Planlama is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,025	Reject the null hypothesis.
6	The distribution of Takdir_Tanım is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,404	Retain the null hypothesis.
7	The distribution of Yenilikçilik is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,000	Reject the null hypothesis.
8	The distribution of Temsil_etme is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,017	Reject the null hypothesis.
9	The distribution of Operasyonları İzleme is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,403	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
10	The distribution of Çalışanları_Geliştirme is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,568	Retain the null hypothesis.
11	The distribution of Birlikte_öğrenme is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,396	Retain the null hypothesis.
12	The distribution of Sosyal_Ağ is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,030	Reject the null hypothesis.
13	The distribution of Problem_çözme is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,321	Retain the null hypothesis.
14	The distribution of Yetkilendirme is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,202	Retain the null hypothesis.
15	The distribution of Değişim is the same across categories of Project_Performance.	Independent-Samples Mann-Whitney U Test	,629	Retain the null hypothesis.

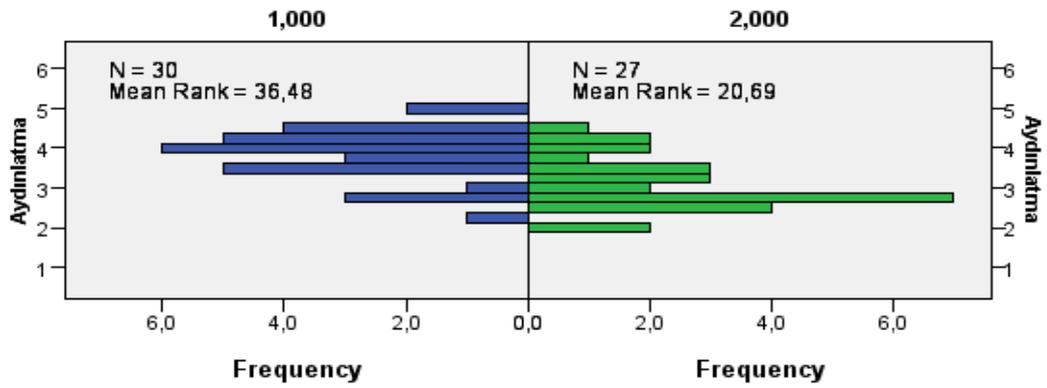
Asymptotic significances are displayed. The significance level is ,05.

Two groups are defined for the application of Mann-Whitney U Test; “1.000” is for high performance noncomplex projects, “2.000” is for low performance noncomplex projects. The test results obtained from SPSS are given in below:

Clarifying:

Independent-Samples Mann-Whitney U Test

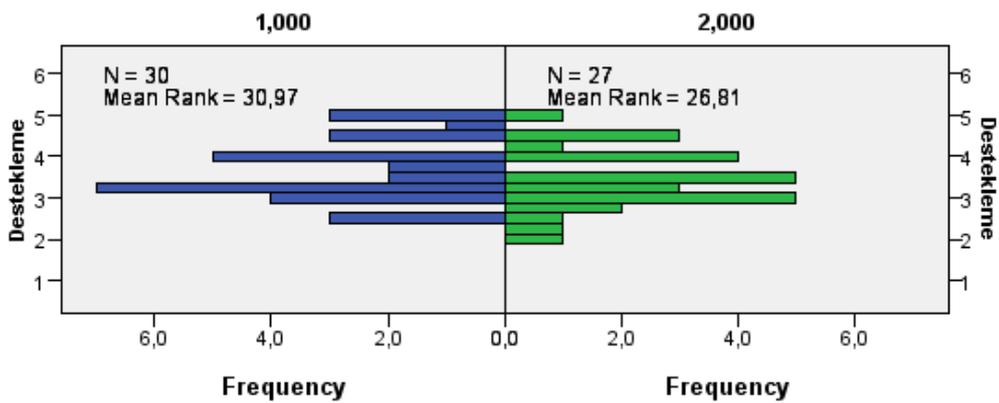
Project_Performance



Supporting:

Independent-Samples Mann-Whitney U Test

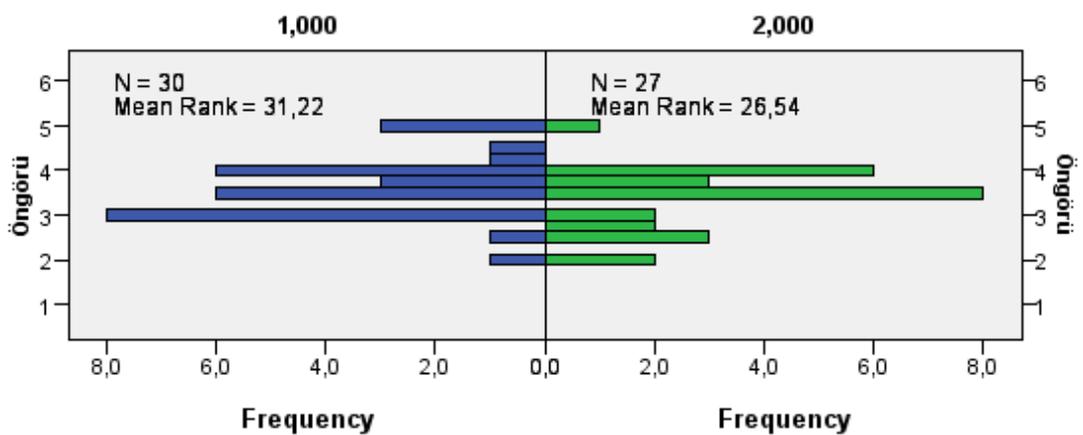
Project_Performance



Envisioning Change:

Independent-Samples Mann-Whitney U Test

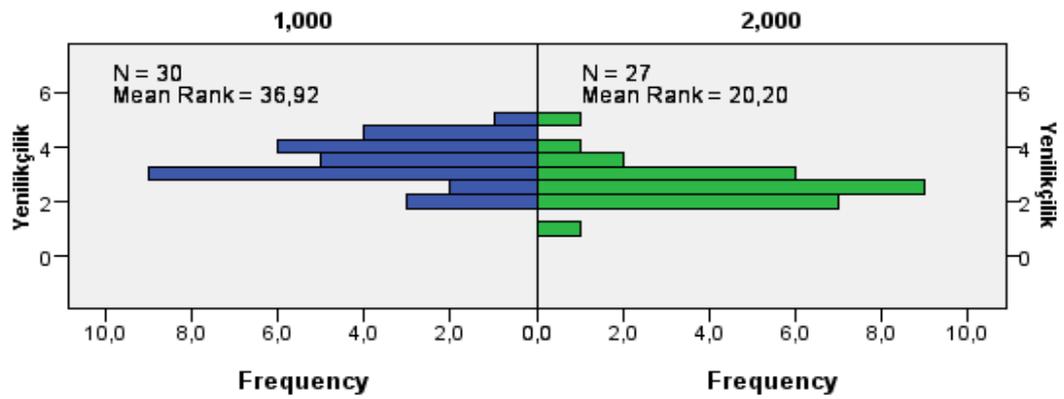
Project_Performance



Encouraging Innovation:

Independent-Samples Mann-Whitney U Test

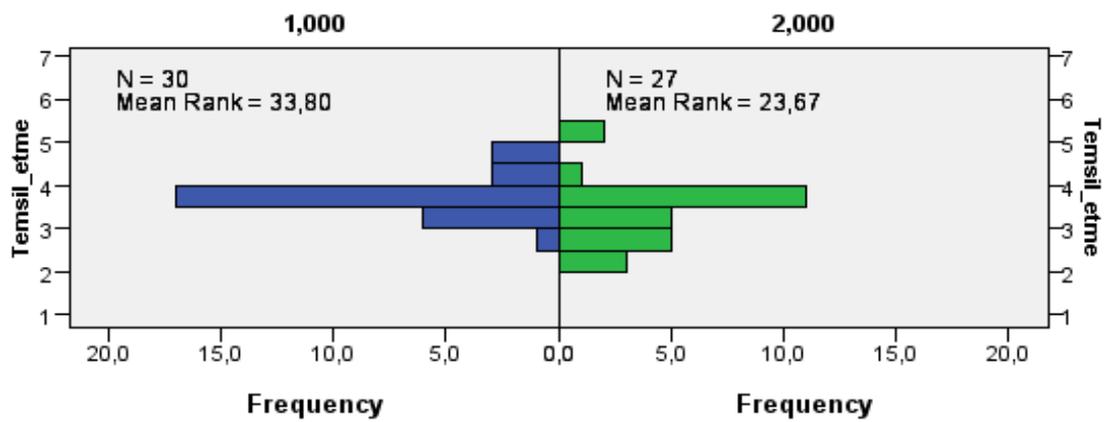
Project_Performance



Representing:

Independent-Samples Mann-Whitney U Test

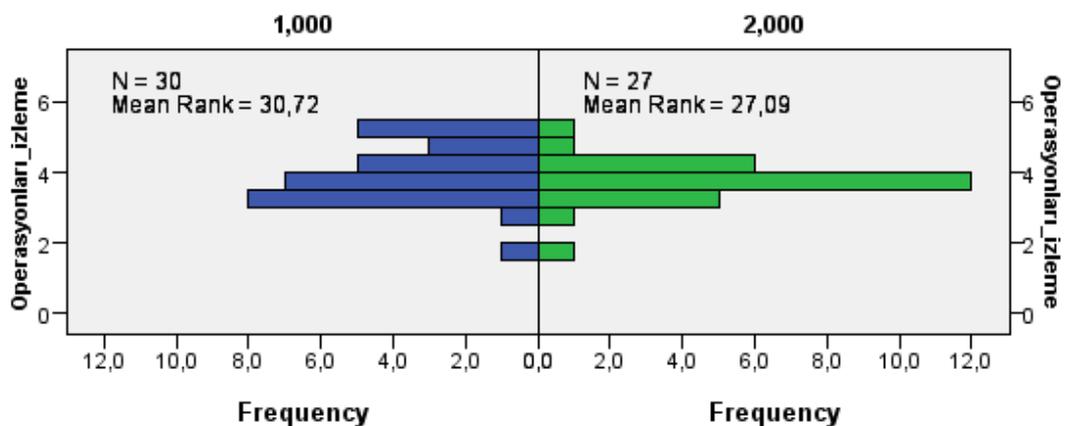
Project_Performance



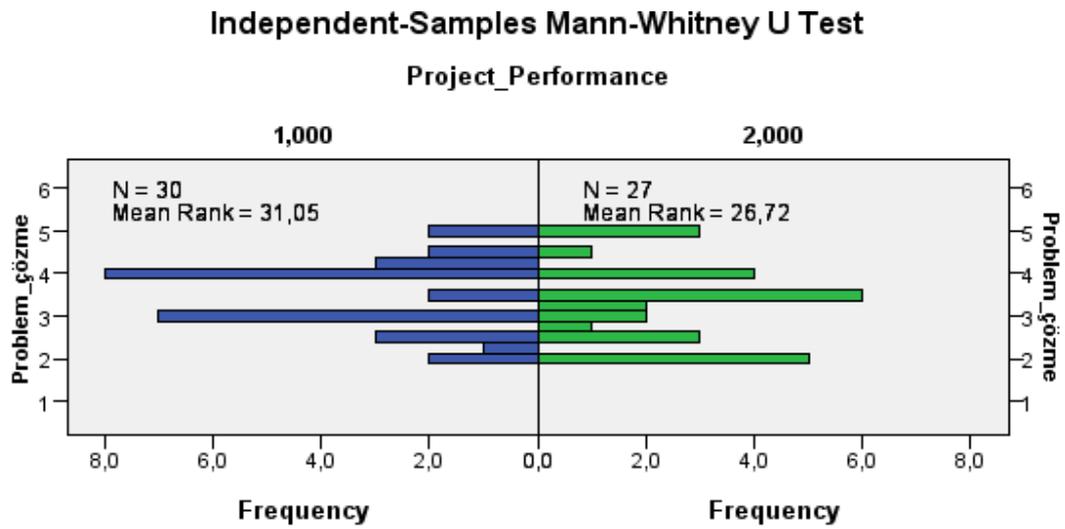
Monitoring Operations:

Independent-Samples Mann-Whitney U Test

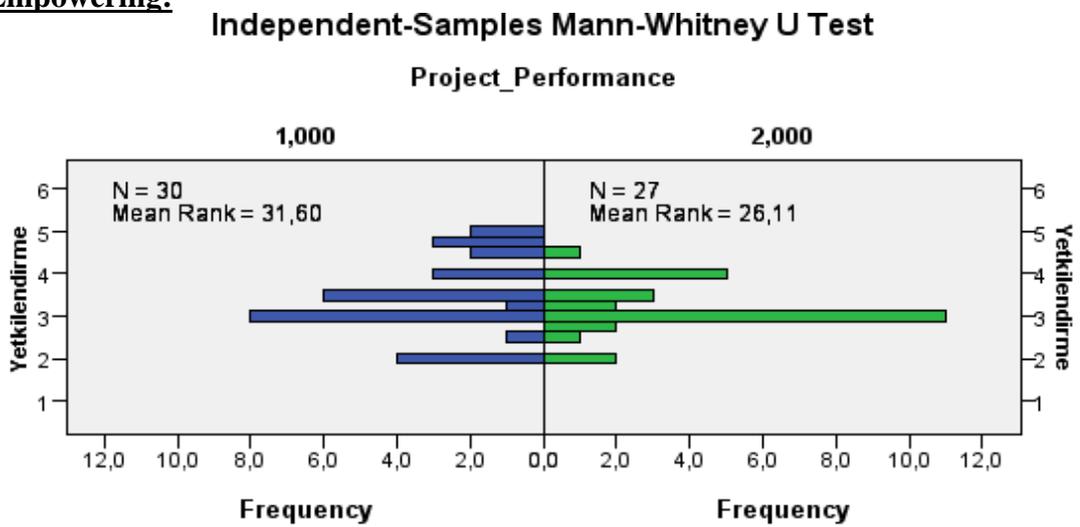
Project_Performance



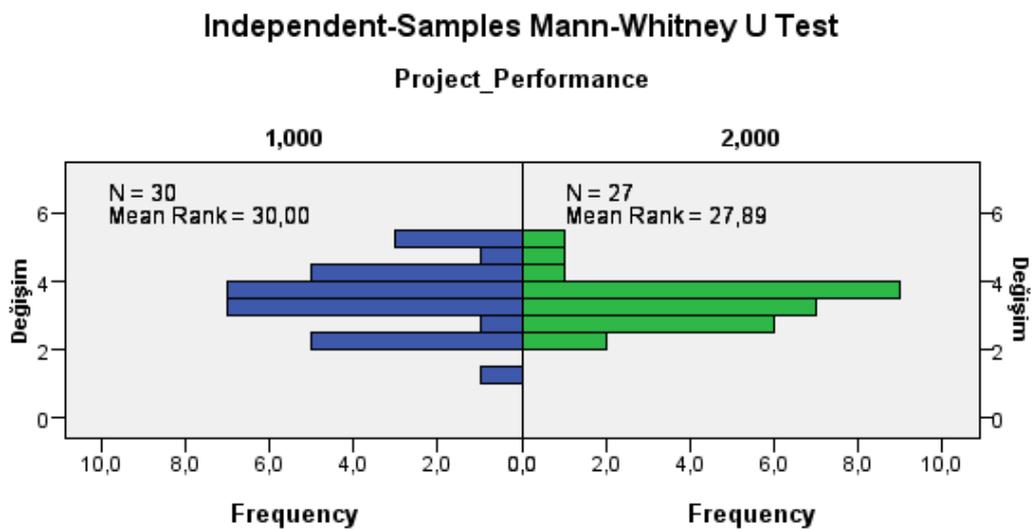
Problem Solving:



Empowering:



Advocating Change:



APPENDIX N

Classification of the selected 35 projects as high performance and low performance

Weighted scores of the projects are application of weighted sum method are given in table below:

Similar to complex project case, normality test to calculated weighted scores is

Project	Weighted Scores	Project	Weighted Scores	Project	Weighted Scores	Project	Weighted Scores
Project_4	-0,18	Project_20	-0,33	Project_1	-0,15	Project_31	-0,06
Project_8	-0,02	Project_5	-0,05	Project_12	-0,03	Project_32	-0,07
Project_25	-0,13	Project_14	-0,09	Project_16	-0,03	Project_10	-0,04
Project_3	-0,13	Project_7	-0,06	Project_18	-0,23	Project_22	-0,02
Project_21	-0,30	Project_6	-0,04	Project_23	-0,03	Project_33	-0,02
Project_15	-0,26	Project_9	-0,09	Project_27	-0,05	Project_34	-0,01
Project_24	-0,15	Project_30	-0,08	Project_29	-0,10	Project_2	-0,02
Project_26	-0,07	Project_17	-0,03	Project_13	-0,02	Project_35	-0,02
Project_11	-0,10	Project_19	-0,03	Project_28	-0,11		

applied to classify projects based on their performances. It is found that the data does not show normality property. (The result os the test of normality are given below)

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
VAR00001	,182	35	,005	,802	35	,000

a. Lilliefors Significance Correction

Therefore, the projects that has an equal or a greater weighted scores from the median value (-0,573) are accepted as high performance and others are accepted as low performance projects.

High Performance Projects		Low Performance Projects	
Project_34	Project_2	Project_32	Project_11
Project_35	Project_19	Project_26	Project_28
Project_22	Project_23	Project_30	Project_3
Project_8	Project_16	Project_9	Project_25
Project_13	Project_17	Project_14	Project_1
Project_33	Project_12	Project_29	Project_24
Project_6	Project_27	Project_4	Project_21
Project_10	Project_31	Project_18	Project_20
Project_5	Project_7	Project_15	

APPENDIX O

Nonparametric Test Results of all projects across leadership style in the case of performance based classification

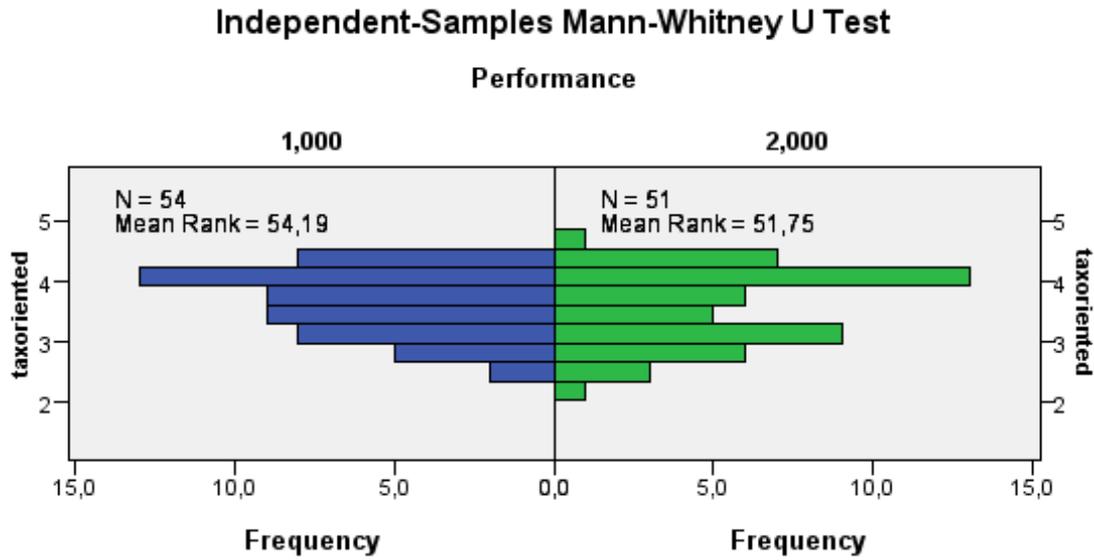
Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of taxoriented is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,681	Retain the null hypothesis.
2	The distribution of relationsoriented is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,152	Retain the null hypothesis.
3	The distribution of changeoriented is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,043	Reject the null hypothesis.
4	The distribution of external is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,160	Retain the null hypothesis.

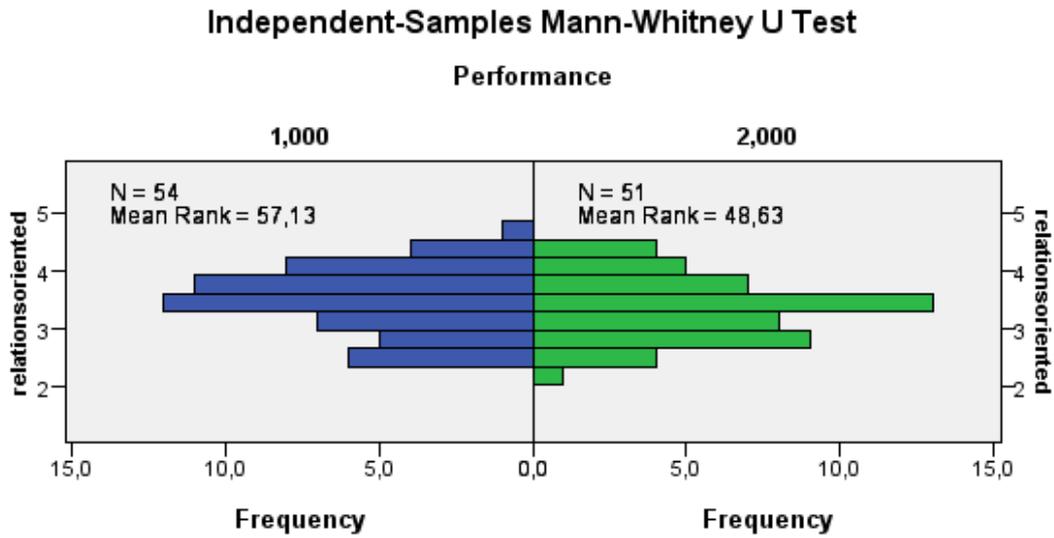
Asymptotic significances are displayed. The significance level is ,05.

Two groups are defined for the application of Mann-Whitney U Test; “1.000” is for high performance projects, “2.000” is for low performance projects. The test results obtained from SPSS are given in below:

Task oriented Leadership Style:



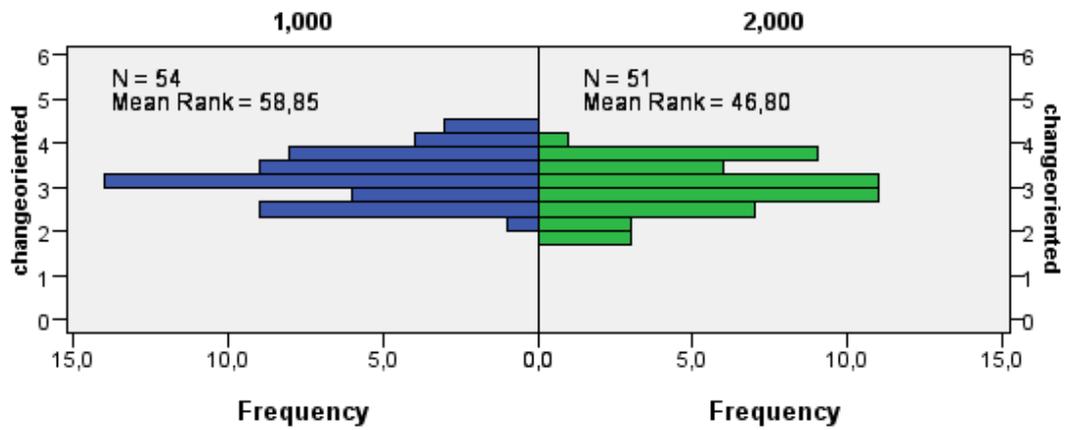
Relations oriented Leadership Style:



Change oriented Leadership Style:

Independent-Samples Mann-Whitney U Test

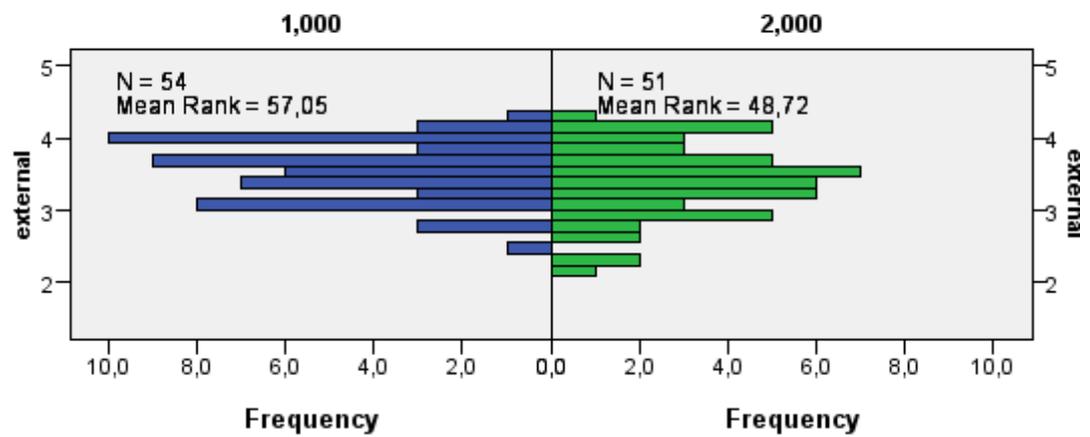
Performance



External Leadership Style:

Independent-Samples Mann-Whitney U Test

Performance



APPENDIX P

Nonparametric Test Results of Leadership Behaviors for all Projects in the case of performance based classification

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Aydınlatma is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,625	Retain the null hypothesis.
2	The distribution of Destekleme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,383	Retain the null hypothesis.
3	The distribution of Öngörü is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,031	Reject the null hypothesis.
4	The distribution of DışDünya is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,037	Reject the null hypothesis.
5	The distribution of Planlama is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,654	Retain the null hypothesis.
6	The distribution of TakdirTanımı is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,207	Retain the null hypothesis.
7	The distribution of Yenilikçilik is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,106	Retain the null hypothesis.
8	The distribution of TemsilEtme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,589	Retain the null hypothesis.
9	The distribution of Operasyonları İzleme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,581	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
10	The distribution of Çalışan_Geliştirme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,756	Retain the null hypothesis.
11	The distribution of Birlikte_Öğrenme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,103	Retain the null hypothesis.
12	The distribution of Sosyal_Ağ is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,176	Retain the null hypothesis.
13	The distribution of Problem_Çözme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,729	Retain the null hypothesis.
14	The distribution of Yetkilendirme is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,279	Retain the null hypothesis.
15	The distribution of Değişim is the same across categories of Performance.	Independent-Samples Mann-Whitney U Test	,683	Retain the null hypothesis.

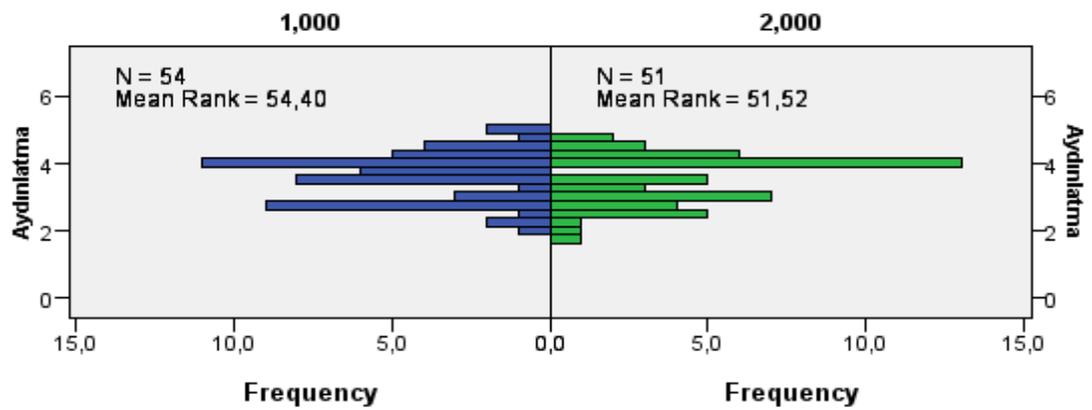
Asymptotic significances are displayed. The significance level is ,05.

Two groups are defined for the application of Mann-Whitney U Test; “1.000” is for high performance projects, “2.000” is for low performance projects. The test results obtained from SPSS are given in below:

Clarifying:

Independent-Samples Mann-Whitney U Test

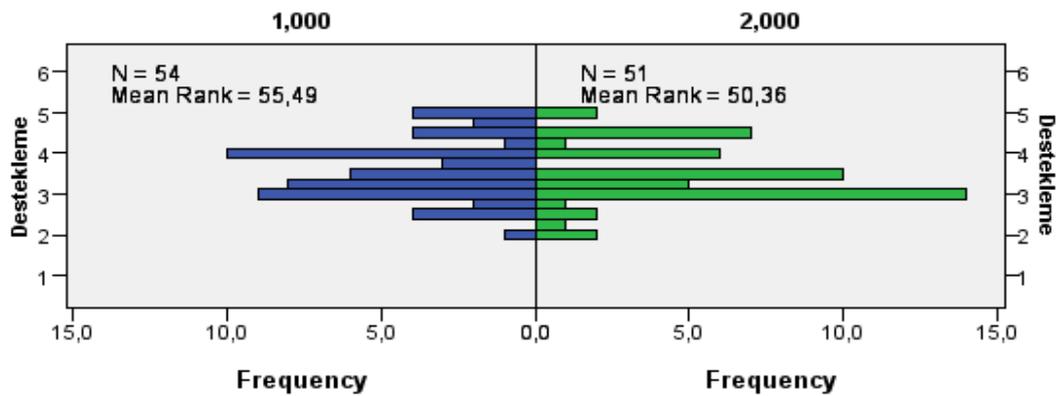
Performance



Supporting:

Independent-Samples Mann-Whitney U Test

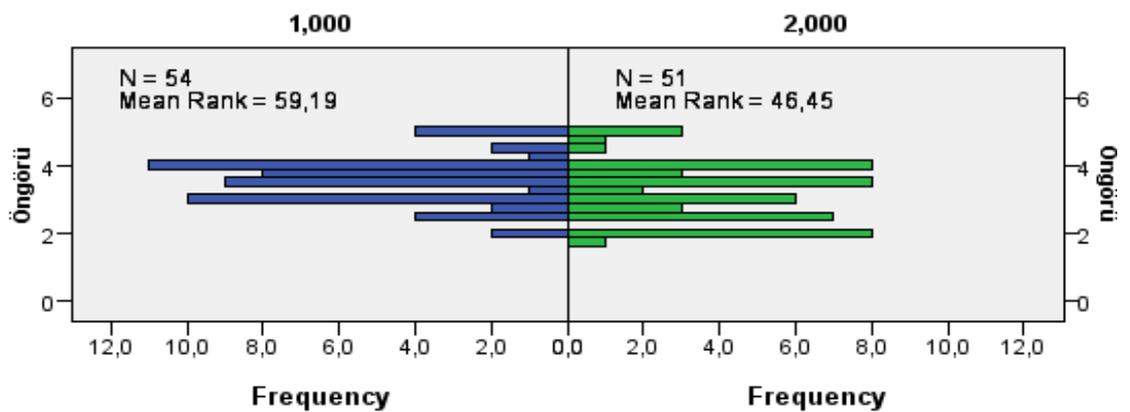
Performance



Envisioning:

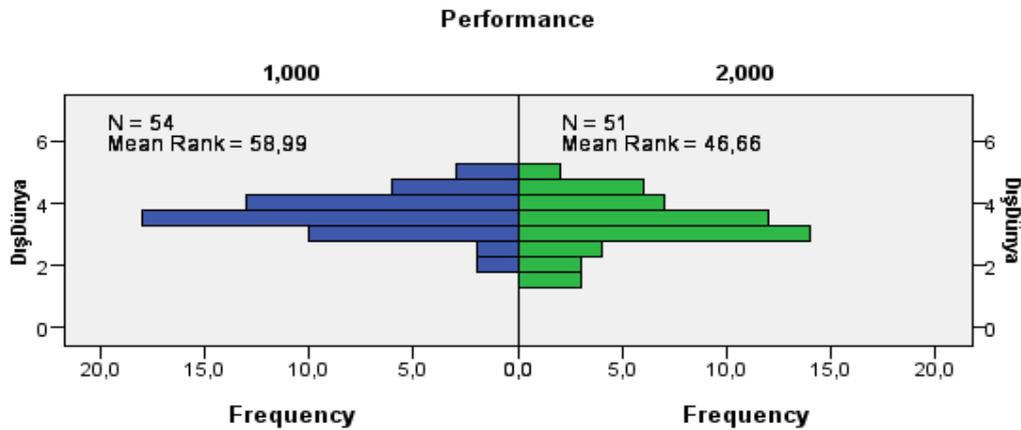
Independent-Samples Mann-Whitney U Test

Performance



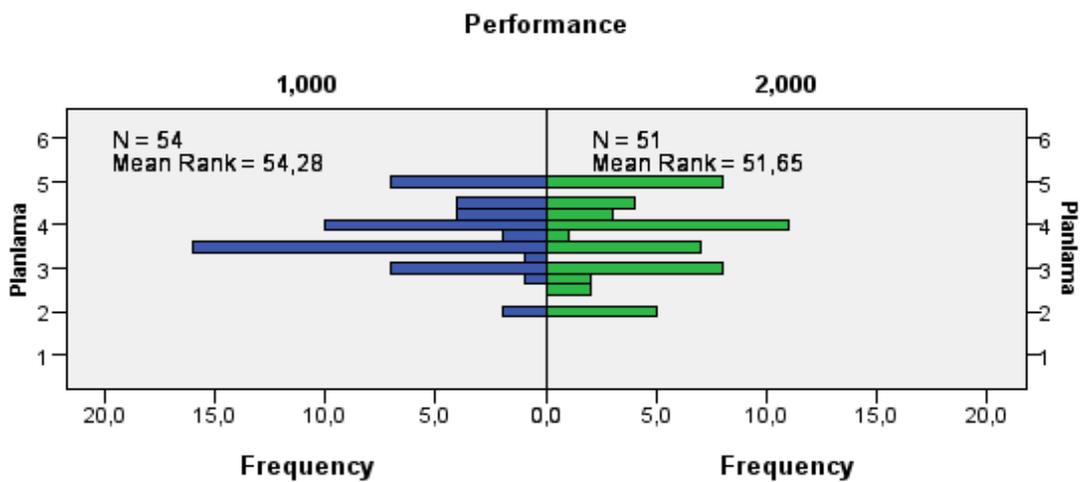
External Monitoring:

Independent-Samples Mann-Whitney U Test



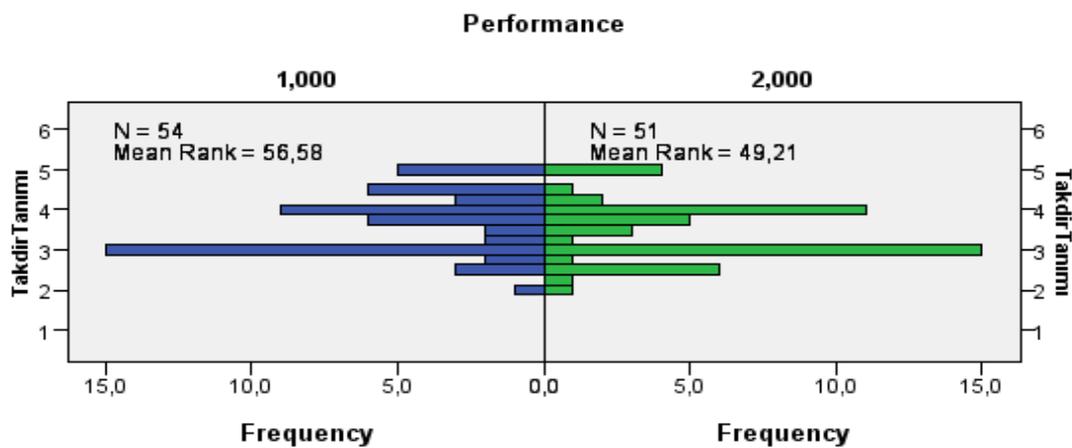
Planning:

Independent-Samples Mann-Whitney U Test



Recognizing:

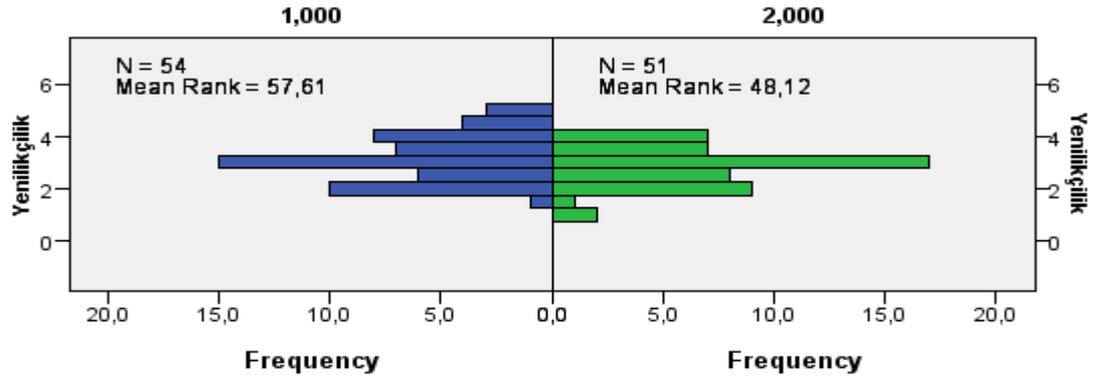
Independent-Samples Mann-Whitney U Test



Encouraging Innovation:

Independent-Samples Mann-Whitney U Test

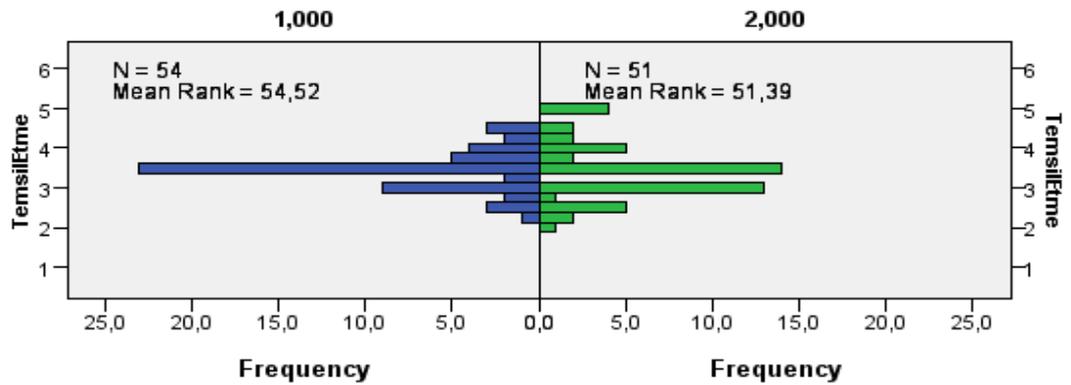
Performance



Representing:

Independent-Samples Mann-Whitney U Test

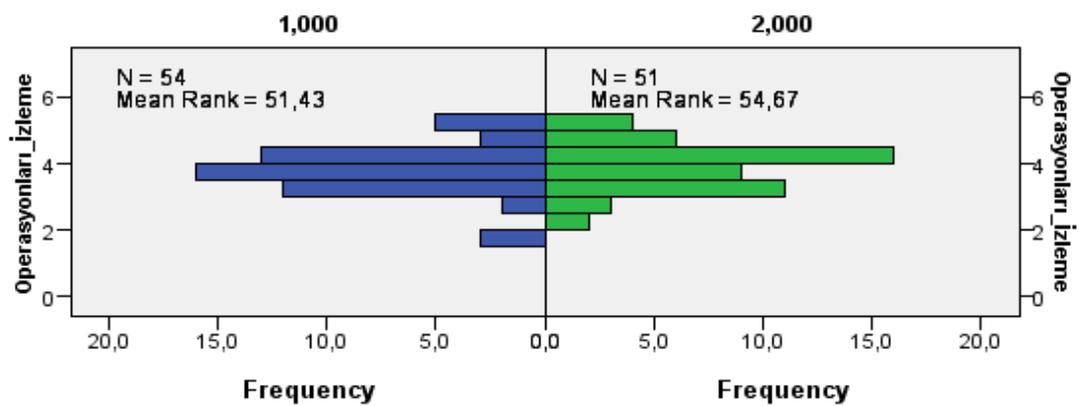
Performance



Monitoring Operations:

Independent-Samples Mann-Whitney U Test

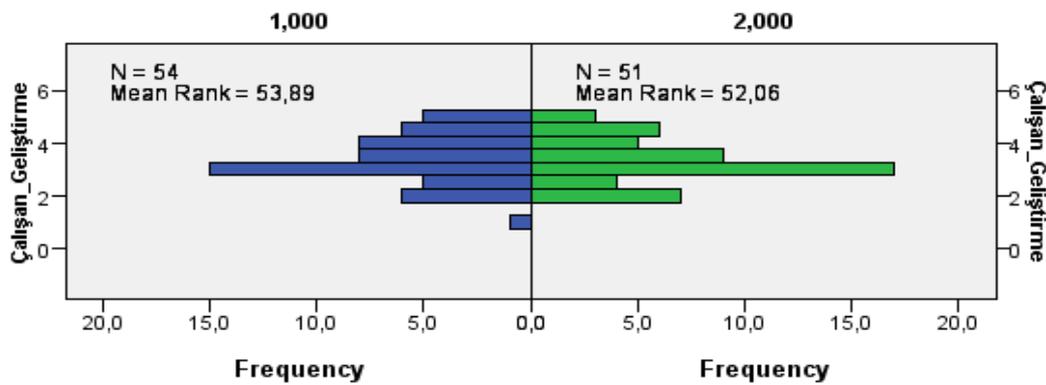
Performance



Developing Member Skills:

Independent-Samples Mann-Whitney U Test

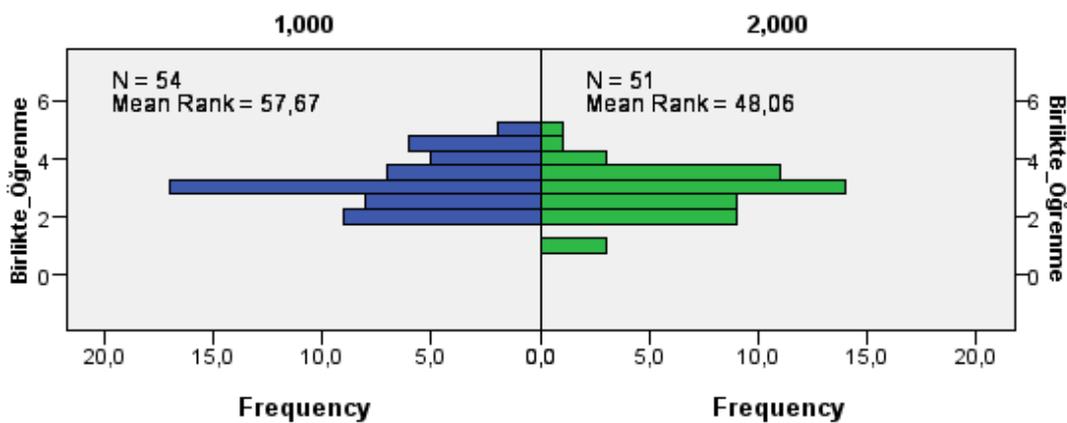
Performance



Encouraging Collective Learning:

Independent-Samples Mann-Whitney U Test

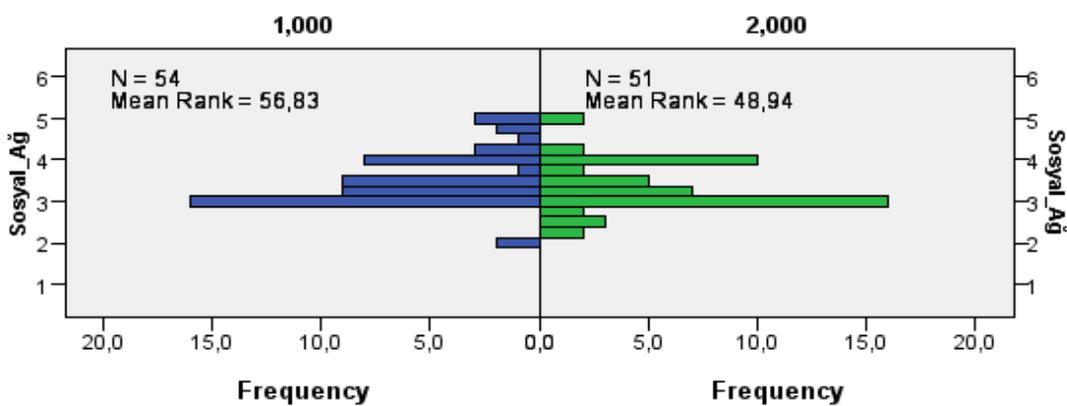
Performance



Networking:

Independent-Samples Mann-Whitney U Test

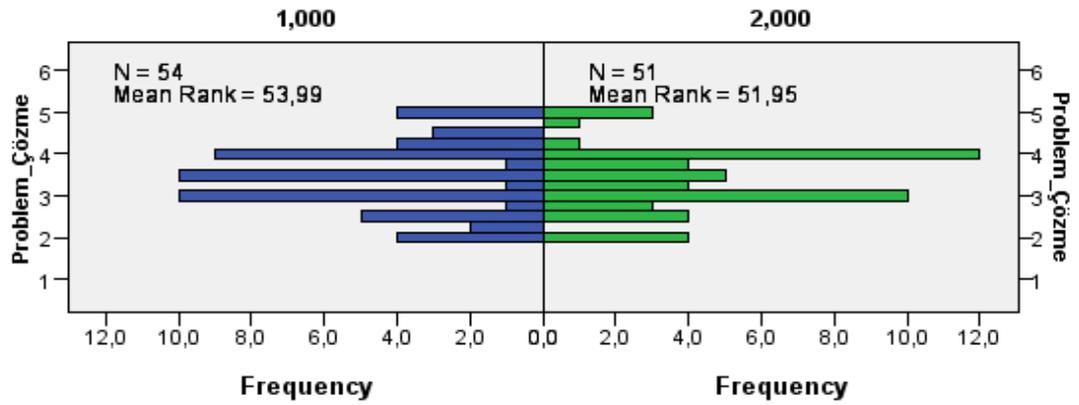
Performance



Problem Solving:

Independent-Samples Mann-Whitney U Test

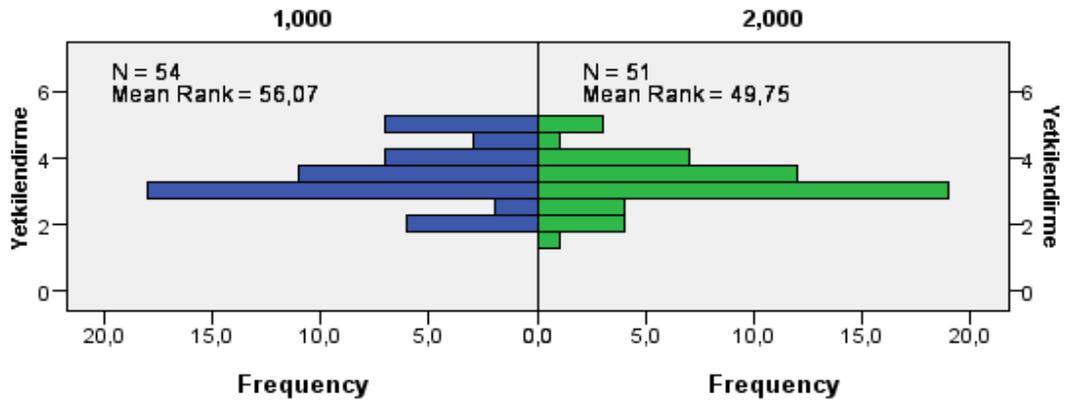
Performance



Empowering:

Independent-Samples Mann-Whitney U Test

Performance



Advocating Change:

Independent-Samples Mann-Whitney U Test

Performance

