Original article

MEASURING CULTURE IN PROJECTS: SCALE DEVELOPMENT AND VALIDATION IN A SAMPLE OF TURKISH PROFESSIONALS

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Abstract: The purpose of this study is to develop a reliable and valid instrument that can be used in organizations to measure project culture and its effects. Since a project culture is formed within the scope of project goals and activities, the organizational culture also affects this culture. For this purpose, a scale has been developed to determine the level of project culture in organizations and to benefit both academia and practitioners.

With Exploratory Factor Analysis (EFA) of the data obtained at the end of the pilot study, a structure consisting of 38 questions in 5 dimensions (1) Project Value and Awareness, (2) Organization and Systems, (3) Process and Method, (4) Stakeholder and Communication, and (5) Strategy Alignment) was created.

As a result of the data received from a sample of 311 Turkish project management professionals, the analyzes were completed with SPSS22 package using factor analyses, confidence analysis and Cronbach Alpha analyses. Additionally, AMOS version 19 was used for confirmatory factor analysis and Structural Equation Modeling.

At the end of all these studies, a project culture scale consisting of 22 questions in 5 dimensions was created.

Keywords: Project; Project culture; Project management; Project management culture; Organizational culture; Project culture dimensions; Project culture measurement.

1. INTRODUCTION

From the perspective of culture, organizations and employees in organizations have their own unique beliefs, thoughts, ways of doing business and methods. It has been determined that culture is of critical importance not only for society but also for organizations, and detailed studies have been carried out on it. According to Hofstede, culture in its simplest form consists of the steps of symbolic thinking, feeling, winning, and transferring the original achievements of symbols and human handicrafts, respectively. He also states that the foundation of culture consists of a set of values associated and connected with traditional ideas (Hofstede, 1980). On the other hand, organizational culture is defined as all social and normative values, beliefs and hidden assumptions that hold the organization together and that its members share (Alkharabsheh et al. 2017).

Projects are defined as a set of works that have original characteristics and are carried out for a certain period, scope, and budget. Projects are carried out to achieve certain goals in all organizations, regardless of the type of

organizational structure. It is possible to say that the projects and project activities carried out within an organization are also affected by the organization in which it takes place, and in a broader context, the culture. Since every organization also creates a set of methods, methodologies, and habits as waterfall, agile or hybrid in the execution of project management activities, it is possible to talk about a project culture that every organization also creates for their project works.

Carrying out the project works in accordance with the needs and reaching the targets determined at the beginning of the project also emerges as a project performance and success. There are many factors involved in achieving success in project performance. The fact that the project studies are the ones that are constantly applied within the organization and are adopted by all employees and the management of the projects in accordance with these methods is also defined as the "project culture".

The purpose of this study, which is one of the rare researches in this field, is to develop a reliable and valid measurement instrument to relate project management methods to the organizational culture, and to measure the project culture formed in the organization, as well as the fact that organizational culture affects the execution of a project in a company. Many instances exist in which the researchers cannot find an adequate or appropriate existing scale to measure project culture. With this scale, it is aimed to measure the level of project culture in organizations, and to provide a solution to the success, resource and communication problems experienced in the projects.

The scope of the research is the development of a scale to measure project culture in organizations. A systematic process is used to develop the scale. Data were collected from a large sample of Turkish project management professional by conducting surveys and interviews in the form of expert opinion, pilot study and general sample to determine the culture created by the people working in different sectors and different institutional sizes who are taking part in the projects. It is the creation of a reliable scale that includes questions to determine the project culture formed within an organization by analyzing the collected data.

The first limitation of this study is that simple practical approaches to measuring the project culture of organizations are not sufficient due to the fact that they evaluate the limited characteristics of the projects. Secondly, the project culture scale studies conducted so far are limited in literature and the most recent study is based on 2015 and before as Du Plessis (2001), Palmer (2002), Stare (2011) and PMI (2015). Thirdly, it should be noted that the project culture scale will achieve its purpose if the current project culture in organizations is intended to be measured. In addition, in institutions that do not work on a project basis and only carry out activities such as production, maintenance and support, the use of the project culture scale will not be purposeful, and data will not be obtained to achieve the desired results. Although the sector is independent, it can be seen as a limit to take the contribution of the employees in the projects in the institutions as a basis for this study. Fourthly, almost all of data were collected from a sample of Turkish project professionals.

The paper is structured as follows: After the introduction, the second part covers the literature review, which includes the theories of organizational culture and project culture. Third part covers the methodological background for scale development. Fourth part covers the results of scale development process with validity and reliability tests. Lastly, in the conclusion part, we propose the Project Culture Scale and provide a wide range of areas for future research.

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW
2.1 Organizational culture

In the literature on Organizational Culture, studies in the fields of organizational behavior and management science are as follows: Organizational culture concept Pettigrew (1979), Hofstede (1980), Pascale and Athos (1981), "Theory Z" from Ouchi (1981), "In Search of Excellence" from Peters and Waterman (1982), "Common Cultures" from Deal and Kennedy (1982), "Master of Change" from Kanter (1983) (Serpa, 2016).

The main reason behind the emergence of organizational culture and the increase research interest in this field is the economic success of Japanese organizations, with the emergence of Japan as an economic power since the end of the 1970s, the fact that American companies began to lose their share in the market in the face of the success of Japanese organizations and cultural and symbolic changes in organizational life (Wilkins, 1983).

Hofstede et al. (2010) defines organizational culture as "collectively programmed thoughts", and Robbins (2001) as "shared system of meanings and symbols". Schein defines organizational culture as "the system of beliefs and values shared by the members of a group, the learned results of group experience, and the pattern of assumptions developed during the learning process in order to solve the problems of internal integration and external adaptation" (Schein, 2010).

2.2 Project and project culture

According to ISO's definition, a project is a set of temporarily organized activities within a defined scope, within a certain period of time, and within the budget, by managing risks, taking into account customer satisfaction and quality, in order to create results such as a unique product or service (Stellingwerf & Zandhuis, 2013).

Although the concept of "project culture" does not have many definitions, according to Schein, E.H. (1990) project culture represents the norms, values, and possible assumptions shared by project team members. Project culture is to have the capacity to quickly identify and solve problems that activate teamwork, increase personal motivation, and threaten project work (Clifford, F., Gray, E., & Larson, W., 2001).

According to the 7th version of PMBOK (2021), the portfolio is formed depending on the strategic decisions of the institutions and the desired results are defined. At the end of the execution of projects and programs, the resulting value is started to be used by the entire organization, stakeholder or customer, who is the requester (PMI, 2021).

According to Škarabot (1994), project culture is an important factor in terms of effective preparation, execution, and successful completion of projects. In the project studies carried out with individuals who have a project culture, it has been observed that the conflicts between the project team are reduced, the communication within the team is strengthened, and it is easier to reach the project goals (Schein, 1990).

As reported in the large-scale research conducted and published by the Project Management Institute (PMI) in Brazil, the importance of communication in ongoing projects in organizations has been emphasized, and determining the organizational culture closest to a successful project management experience and the method of its implementation can be considered as a process (PMI, 2015).

Agile project method selection strategy for the organization is the key component for the organization to benefit from the advantages of agility and to solve the problems in the selection stage (Nerur et al., 2005; Soundararajan et al., 2013). Despite the advantages of agile project methods, it is difficult to adopt agile methods due to the organizational culture in the organization, the resistance to change, the lack of support expected from the management, and the conditions in the company (Dyba & Dingsoyr, 2009). On the other hand, agile methods are an option for a solution to the difficulties that may be experienced in software development due to the priority of features such as budget, schedule and quality and business strategy in the project (Santos et al., 2011; Tam et al., 2020).

The type of project to be carried out, the communication method, the support of the senior management, and the culture variables in the institution can be used as the criteria for the institution in the selection of the project method (Campanelli & Parreiras, 2015). The need to determine the organizational culture is very important in order to achieve the best management practice for the projects. Moreover, project management is a practice in which organizations invest in optimizing their

activities and choosing the right strategy for the improvement of their ongoing operations. Project management is essential to identify the best strategic options and optimize activities for the development of organizations, while ensuring the development of products and services.

Focusing on the traditional waterfall project method type, PMBOK version 6 gives equal weight to all approaches such as predictive, agile and hybrid life cycle with PMBOK 7 (2021).

2.3 Literature review on project culture scales

Four studies were found in determining the project culture dimensions in the literature research and they are listed in Table 1. Du Plessis' (2001) research, inspired by Deal and Kennedy's (1982) research on organizational culture, states that organizations should be perceived holistically and that the dimensions of project culture in organizations are formed in four dimensions, which are, (1) project processes, (2) project system and structure, (3) project environment, and (4) project

stakeholders.

Palmer (2002) states that there are six basic elements of project culture and listed these elements as (1) formalizing the project, (2) defining the project, (3) analyzing the project subjects, (4) researching and developing the project processes, (5) starting the project and (6) reviewing the project activities.

Stare (2011) in his study to determine the level of the culture of organizations in Slovenia, proposed the dimensions of the project culture as; favorite management attitude, priorities of projects, management level attitude, project internal regulations and respect for the official authority of the project manager (Soundararajan et al., 2013).

PMI prepared and shared the project management culture in four dimensions in its 2015 research prepared by making use of research on project management and project practitioners: understanding the value of project management and mature project and program and portfolio management processes, activating the sponsor in projects, and the compatibility of projects and programs with strategies (PMI, 2015).

Table 1: Studies on project culture and dimensions

Dimension numbers	Studies on project culture			
	Du Plessis (2001)	**Palmer (2002)**	**Stare (2011)**	**PMI (2015)**
1	Project processes	Formalization and initiation of the project	Favorite management attitude	Fully understanding the value of project management
2	Project system and structure	Description of the project	Project priorities	Highly mature project, program and portfolio management
3	Project environment	Analyzing the project topics	Attitude of management team	Requiring active sponsors on projects and programs
4	Project stakeholders	Researching the project successes	Project internal regulations	Aligning projects and programs with the organization's strategy
5		Starting and disseminating the project	Respect for the official authority of the project manager	
6		Project review		

When the project culture dimensions specified in Table 1 are analyzed; the dimensions of the project culture scale prepared by Du Plessis (2001) were 4 and limited on focusing only on the process, system, environment and stakeholders. It has been seen that the dimensions prepared by Palmer (2002) generally only deal with the project activities as a process. The project culture scale prepared by Stare (2011) consists of 5 dimensions, and the study here was determined to be narrow in scope at the level of the organization's executive management and approach to the project, project priorities and procedures. The project culture scale prepared by PMI (2015) has 4 dimensions and focuses on value, processes, sponsor support, and compliance with the organizational strategy.

2.4 Research questions

Measures commonly used in studies in Table 1 have been shown that these scales were prepared in the pre-pandemic period, and that they did not focus on issues such as agility, sustainability, and strategy, which are even more important after the pandemic. According to PMBOK 7th version that was published in 2021, the project focuses on the customer, the organization and the values involved in the project, rather than the products or deliveries at the end of the project. In addition, it aims to include the value that will emerge at the end of the project as a "value chain" that connects corporate strategy and business goals. From the feedback received from the literature, industry professionals and practitioners, there is a growing need to develop a new and updated project culture scale which can reflect current conditions.

Considering the above statements, we have proposed some research questions for developing a project culture scale:
- What are the necessities for the formation of a project culture in organizations?
- Is it possible to measure culture in projects?
- How can we develop a reliable and valid instrument to measure project culture?
- What could be the dimensions of Project Culture?
- How does the industry and literature

benefit by using project culture scale?

2.5 Project culture dimensions

In this research, 5 dimensions were determined in the project culture scale; based on the dimensions in the four studies mentioned in Table 1, and from the opinions of the interviewed project experts and their project management experiences. It is possible to explain the reasons for choosing the five dimensions in the scale indicated in Table 2 as follows:

Table 2: Project culture dimensions

Item	Project culture dimensions
1	Project value and awareness
2	Project organization and systems
3	Project process and methods
4	Project stakeholder and communication
5	Alignment of projects with corporate strategy

1. **Project value and awareness:** One of the first steps in the formation of a project culture, which is necessary for the successful execution of project studies in an organization, is the formation of project and project management awareness. In addition, it has been seen that it is important to be aware of the value that the projects add to the customer and the organization at the end of the project by adopting the goals and objectives.
2. **Project organization and systems:** Both the feedback from the project management experts and the suitability of the organizational structure of the organization in order to create a project culture were considered important. In addition, the existence of a project management application or system in the organization has been considered important in terms of monitoring the project activities, assigning the works to the people, compliance with the project goals, tracking the project success and creating a corporate memory in the organization with the report.
3. **Project process and methods:** It has been decided to consider the project management processes and the procedures related to them, as well as the methods as a form of management of the projects, as a dimension, since they are both included in other studies in the literature and are

important issues for the formation of a project culture. In addition, agile project management or adaptation of hybrid models should be done by following current developments in project management methods. At this point, the important point is to determine the project management that is suitable for the corporate culture and organizational structure.

4. **Project stakeholders and communication:** It was considered important to include stakeholder communication activities, which are a significant proportion of project activities, as a separate dimension. Since PMBOK version 5 (2014) prepared by PMI, stakeholder management has been handled as a separate knowledge area and the importance of stakeholder management has been revealed. For this purpose, this dimension has been added in terms of both the management of the project stakeholders and the whole project communication.

5. **Alignment of projects with corporate strategy:** While the projects support the corporate strategies of the organizations, activities such as which projects serve which strategy and which projects should be selected are handled within the scope of portfolio management, and compliance with the strategy is also considered as an important dimension to be followed.

3. RESEARCH METHODOLOGY
3.1 Scale development

The scale development process generally consists of three stages: (1) preparation of the question pool, (2) structuring of the scale, (3) evaluation and analysis of the results obtained by testing the scale with a pilot and general sample (DeVellis, 2017).

Regarding to DeVellis' (2017) methodology, both qualitative and quantitative research techniques were used in this study. The main stages of the scale development model followed in this research is explained in detail below:
- Preparation of Dimensions and Item Question Pool:
  o Performing a literature review,
  o Receiving comments from literature review and expert opinions.

- Configuring the Scale, Expert reviews:
  o Descriptive analysis,
  o Internal consistency analysis,
  o Relational analyzes.
- Statistical Analysis and Finalization of the Scale:
  o Making updates as a result of the analysis,
  o Relational analysis between factors,
  o Internal consistency and reliability analysis.

3.1.1 Preparation of the item pool and submission to expert opinion

In order to find evidence for the content validity of the scale, comments on the items can be requested and the perspectives of the experts on the structure can be revealed. After revealing the relations of the items with the structure, support can be requested on the intelligibility of the items. Again, by asking the experts, information about the scientific accuracy, language level and clarity of the items can be obtained (Ayre & Scally, 2014).

The majority of the item question pool, consisting of 91 questions in total, was prepared from the questions of project culture scale dimensions in the literature, which are related to five dimensions. The remaining items were determined by updating to expert opinions and project experiences.

During the evaluation of the scale items, 26 experts working professionally in the field of project management, whose names were determined before, were interviewed and their comments were received on the dimensions of the project culture scale and the item question pool. The degree of suitability of the substance (not at all suitable, partially suitable, suitable) and their recommendations, if any, were requested from the experts. The comments received were evaluated and the pool of 91 questions was updated by adding and subtracting according to the appropriateness of the items in the expert comments, resulted in 72 questions in total. In addition, by getting support from a linguist, the reflection of the questions in the participants and their correct perception were ensured. Before the pilot application, the distribution of dimensions and item numbers was formed as in Table 3.

Table 3: Dimensions of the scale at the end of expert opinions

Item	Scale dimensions	Number of questions
1	Project value and awareness	9
2	Project organization and systems	15
3	Project process and methods	14
4	Project stakeholder and communication	21
5	Alignment of projects with corporate strategy	13
	Total	**72**

3.1.2 Pilot study with analysis and results

A pilot study is carried out by applying the scale, which has passed from the expert opinion, to a small sample group of 93 professionals. In this way, it is aimed to obtain information about the compatibility of the items with the scale and the internal validity, while obtaining information about the scale items by making item and reliability analyzes (Bryman, & Cramer, 2012).

The item pool consisting of 5 dimensions and 72 questions, prepared within the scope of the pilot study, was prepared with a 5-point Likert scale. The survey was shared with 93 experts in the target group working on project management, and responses were received from a total of 76 people.

It is recommended that the Cronbach's alpha coefficient be 0.70 and above for the item-total correlations of the items and the whole scale (Bryman, & Cramer, 2012). In the pilot application, the Cronbach's Alpha value was determined as 0.972. In addition, item correlations within each dimension were tested and indicated in Table 4.

Table 4: Relationship of dimensions to each other

	Dimensions	Number of items	Value of Cronbach's Alpha
Project culture scale	Project value and awareness	9	,851
	Project organization and systems	15	,879
	Project process and methods	14	,900
	Project stakeholder and communication	21	,931
	Alignment of projects with corporate strategy	13	,888
	Total	**72**	**,972**

In the SPSS analysis of the data resulting from the research, the Cronbach Alpha value showed that the scale was highly reliable and the KMO value was also at a good level. In addition, Cronbach's Alpha values were examined on a dimension-based basis in order to observe the effect of the questions on each other each dimension.

The Structural Equation Model was created and checked in order to determine the relationships between dimensions and variables, and to determine how well the model describes the data obtained through goodness of fit indices.

The five dimensions of the Project Culture scale are abbreviated in this study as:
1. Project value and awareness (Value),
2. Project organization and systems (Organization),
3. Project process and methods (Process),
4. Project stakeholder and communication (Communication),
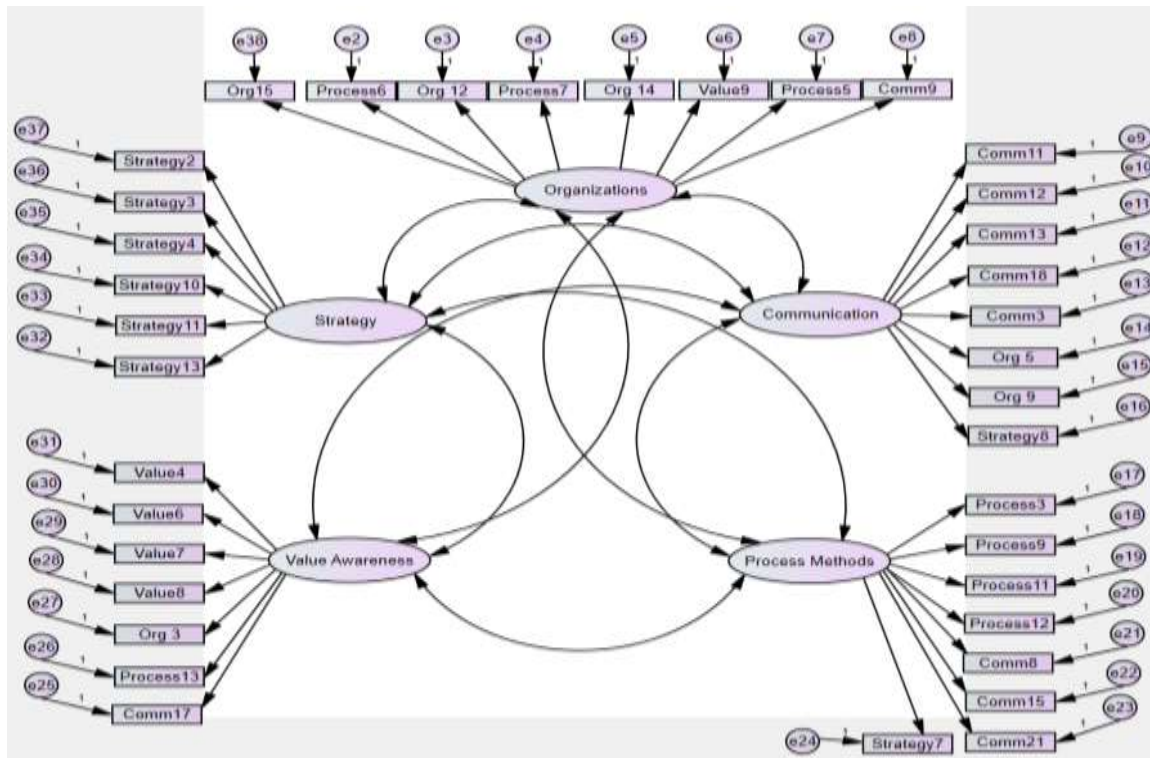5. Project alignment with corporate strategy (Strategy).

Figure 1: Post-pilot Structural Equation Model (SEM)

Question items that were different according to the fit values of the model shown in Figure 1 were selected. It was observed that the fit values of the model were within the limits of good fit values and sufficient evidence was provided that the model was structurally fit as a result of the modification made by testing the structural equality again by associating the four specified expressions in pairs.

3.1.3 Preparation phase for the general sample

Items found to be problematic in the analysis made at the end of the pilot application can be removed from the scale. In this context, 34 out of 72 questions were not deemed appropriate and removed from the item pool. Finally, 38 questions were found suitable and determined to be used in the general sample.

The survey is divided into two separate parts. The first part includes questions about demographics (such as gender, age, education level, experience level, sector of work, role in the project). In the second part, in order to determine the organizational culture, the Project Culture Scale in which 5-point Likert-type questions (1= Strongly disagree, 2= Disagree, 3= Undecided, 4=Agree, 5=Strongly agree) was applied.

According to the analysis results and expert opinions at the end of the pilot application, the scale items, scale instructions, scaling method and scale duration were decided, and the scale was finalized. Determining the number of participants in scale development studies has always been a controversial issue. If it is desired to prepare a 20-item scale, it may be appropriate to reach less than 300 participants (DeVellis, 2017). At this stage, it is observed that the quality of the selected group comes to the fore as well as the quantity. The general sample participants in the survey were selected as the employees working on projects in institutions where they work independently of the sector. This situation supports the contribution of the participants to the survey both quantitatively and qualitatively.

3.1.4 Sampling

The main sampling application was carried out independently of the sector, and in order to reach the participants, it was sent to 8 corporations and associations operating mainly in project management, with professional and social media sites (LinkedIn, WhatsApp groups, etc.), and to 13 Chamber of Commerce and Business to share with their members.

As a result, 311 responses (with 93% response rate) were found to be suitable. The distribution of the 311 participants, such as the sector, the company, the position, and their experience are shared in the table as Appendix 1. It has been seen that the participants are professionals involved in project activities in different sectors.

3.1.5 Demographic characteristics of respondents

Among demographics of the participants such as age, gender, institution size, education level, project management experience, roles in the project and sector information of the institution were asked, and the distribution according to the answers received is shown in Appendix 1.

4. RESULTS

Following the results of item analysis and structural factor analysis, the contribution of the scale length to reliability was also taken into account when giving the final form of the scale. At this stage, the scale development process was completed by eliminating the bad items and maximizing the reliability coefficient (Ayre & Scally, 2014).

Communalities values below 0.4 for the items were eliminated one by one, taking into account their distribution in the factors on the Rotated Matrix. At the end of each elimination, factor analysis was performed again and the load distributions of the KMO Bartlett, Cronbach Alpha Values, Communalities and Rotated Matrix values and factors were checked. In addition, anti-image values were also checked and confirmed, and the values of all items were confirmed to be 0.8 and above. In order to carry out factor analysis, first of all, the Kaiser-Meyer Olkin (KMO) coefficient, which enables the evaluation of sample adequacy, was calculated and it was found that with the obtained value of 0.929, it was above the acceptable limit of 0.70 and the sample was sufficient for factor analysis (Hair et al., 2010).

At the end of all these analyzes, the following situation emerged:
- 16 out of 38 items were excluded, because they did not provide the specified analysis values,
- The remaining 22 items provided the basis for analysis.

Analysis values for 22 items are shown in Table 5.

Table 5: Test results of KMO and Bartlett

KMO and Bartlett's Test		
KMO measure of sampling adequacy		,929
Bartlett's test of sphericity	Approx. Chi-Square	3356,004
	Df	231
	Sig.	,000

Looking at the scale, the result of the research for the KMO value is excellent.

Table 6: Reliability statistics

Reliability statistics	
Cronbach's Alpha	N
,926	22

When Table 6 is examined, it is seen that the project culture scale is highly reliable and the answers given to the statements in the scale are consistent. It is interpreted that the scale items with high Cronbach's alpha coefficient are compatible with each other and contain items measuring the same feature.

The lowest reliability values calculated for the dimensions and all 22 statements in the scale is

0.921 and changed between 0.921 and 0.926. In this result, none of the statements have a negative effect on the reliability level of the scale, and when removed from the scale, it will not create a significant increase in the confidence level.

5. CONCLUSIONS

In this study, it was proposed to develop a "Project Culture Scale", which was a necessity in the field of project management and also to fill a gap in the project management literature. The validity and reliability of the scale were tested with a large sample form organizations of different sizes and projects of different scales, regardless of the sectors.

The proposed "Project Culture Scale (PCS)" consists of five dimensions: *(1) Project Value and Awareness, (2) Project Organization and Systems, (3) Project Process and Methods, (4) Project Stakeholder and Communication, and (5) Alignment of Projects with Corporate Strategy.* It was seen that this scale provided statistically sufficient conditions. In line with the findings obtained, the knowledge area and processes of project management, factor loads, and project culture dimensions were collected. According to the exploratory and confirmatory factor analysis, the scale is statistically significant and reliable.

"The Project Culture Scale" which was developed and validated in this study is a measurement tool that can be applied to organizations. Determining the level and maturity of the project culture raises awareness of development and improvement. In addition, this developed scale is also a source for different studies to be carried out by project managers and all project stakeholders, especially the project team working in the projects.

Research conducted for the development of project management maturity and culture reached a significant number. However, in order for these projects to be managed with the right project management methods as waterfall, agile or hybrid to be aligned with organizational culture in order to achieve successful results and to measure the success of the project and project management, the importance of establishing a project culture in the institutions becomes even more prominent. Especially small and medium-sized organizations (SMEs) need significant support both from their technological and organizational transformations, and in the management of their studies and projects. In addition, project management activities such as analysis, planning, execution, and control will provide very important gains so that all sector-independent institutions can carry out their transformation and development in a planned manner. At this point, scales and models will be needed to determine the level of project culture of organizations. This study will benefit all organization owners, managers, and practitioners especially at this stage.

The more the number of studies on project management, the higher the awareness level will be. The reason why there are limited studies on this subject is that the project management approach has not been adopted in many organizations. The methods may seem new, different, and complex to managers and employees, and the scales that can set an example and benefit from have not been developed yet. This research will benefit researchers in terms of having a ready-made scale and will shorten the research process by eliminating the scale development process.

While this scale contributes to the purpose if it is desired to measure the current project culture in organizations, it will not give the desired results in institutions that do not work on a project basis and only carry out activities such as production, maintenance, and support. For the future research, associating the project culture with different variables and preparing new scales will accumulate. In future research, its reliability and validity can be increased by using different sub-applications and larger sample groups from different geographies except Turkey to develop the project culture scale. Especially by using this scale, studies can be conducted on the performance of organizations in projects, their efficiency, quality, and their effects on employees. In particular, there are some issues such as the determination of development areas depending on the determination of the project culture maturity of the institutions; the relationship between project culture and project performance and between project culture and project capabilities; the relationship of project culture with the development of technology, especially artificial intelligence, virtual organizations and the effect of remote working on the project culture. It can be expected to contribute to many research areas.

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Appendix 1: Demographic characteristics of participants

Category	Category	Participant number	Participant rate (%)
Gender	Female	101	32,0
	Male	210	68,0
Age	18-25 Age	18	6,0
	26-35 Age	64	21,0
	36-45 Age	147	47,0
	46-55 Age	68	22,0
	56 and above	14	4,0
Education	Associate degree	6	1,0
	Bachelors degree	148	48,0
	Masters degree	139	45,0
	Doctorate	18	6,0
Corporate size	SME (1-250 workers)	123	39,0
	Corporate (251-1000 workers)	55	18,0
	Corporate (1001+ workers)	133	43,0
Project management experience	0-1 year	19	6,0
	2-4 year	50	16,0
	5-7 year	77	25,0
	8-10 year	95	30,0
	11 and above	70	23,0
Project roles	Project team member	38	12,0
	Developer or test engineer	7	2,0
	Business analyst	8	3,0
	Consultant	7	2,0
	Project team leader	28	9,0
	Project sponsor	23	7,0
	Functional (department) manager	75	24,0
	Project manager	125	41,0
Industry	Informatics / technology	66	21,0
	Finance / Insurance	49	16,0
	Telecommunication	42	13,0
	Education / Consultancy	25	8,0
	Defence industry	21	7,0
	Manufacturing industry	20	6,0
	Aviation / Transportation	15	5,0
	Energy / Automative	15	5,0
	Media / Entertainment	13	4,0

		12	4,0
	Non-governmental organization (NGO)	12	4,0
	Construction / Real estate	11	3,0
	Tourism / Health	6	2,0
	Trade	5	2,0
	Retail service industry	5	2,0
	Other industries	6	2,0

Appendix 2: Finalized project culture scale items

Item	Dimension name	Finalized items
1	**Project value and awareness (1#4)**	The projects are carried out within a certain time frame at my organization.
2	**Project value and awareness (2#4)**	The discipline of critical knowledge areas of the projects is ensured at my organization.
3	**Project value and awareness (3#4)**	The control of project deliveries is carried out effectively at my organization.
4	**Project value and awareness (4#4)**	Learning and improvement is part of project management at my organization.
5	**Project organization and systems (1#5)**	It is seen that the organizational structure of my organization plays an important role in the success of the project.
6	**Project organization and systems (2#5)**	The applications and systems in my organization ensure that the projects are delivered in accordance with the plan.
7	**Project organization and systems (3#5)**	At my organization, the project management office actively manages projects with project managers.
8	**Project organization and systems (4#5)**	At my organization, the project objectives and rewards are determined in accordance with the organizational rules.
9	**Project organization and systems (5#5)**	The organizational structure of my organization is agile and flexible to align with the strategy.
10	**Project process and methods (1#3)**	It is important to understand and use the project management methodology and systems at my organization.
11	**Project process and methods (2#3)**	At my organization, project management procedures depend on processes and are shared with all stakeholders.
12	**Project process and methods (3#3)**	At my organization, the importance of the project and how the projects affect each other are known.
13	**Project stakeholder and communication (1#5)**	Communication with the project stakeholders is carried out in a planned manner at my organization.
14	**Project stakeholder and communication (2#5)**	At my organization, it is important to determine the project stakeholders completely.
15	**Project stakeholder and communication (3#5)**	At my organization, the project management office is in contact with different stakeholder organizations for the development of project management.
16	**Project stakeholder and communication (4#5)**	The people working on the projects at my organization have the necessary competence and diversity for the project.
17	**Project stakeholder and communication (5#5)**	At my organization, all project employees are appreciated and rewarded depending on the success of the project.

18	**Alignment of projects with corporate strategy (1#5)**	By determining the projects related to the strategic goals of my organization, the realization of the goals is followed.
19	**Alignment of projects with corporate strategy (2#5)**	At my organization, the senior management and/or the project management office prioritize the projects.
20	**Alignment of projects with corporate strategy (3#5)**	Portfolio management is carried out at my organization and related projects are carried out.
21	**Alignment of projects with corporate strategy (4#5)**	At my organization, the projects are aligned with the strategic priorities of the organization.
22	**Alignment of projects with corporate strategy (5#5)**	At my organization, it is important for the project employees to know which strategic goals they are working on in the projects.