

The Relationship Between Project Organizational Culture and Projects Performance in Construction Industry of United Arab Emirates (UAE)



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Abstract Cultural influence in project management has recently been given a lot of attention by academics due to its vital role in the success or failure of projects. Numerous empirical studies have looked at how culture affects project management in the construction industry, but it is uncommon to look at organizational culture at the project level. The objective of this study is to assess the relationship between the project organizational culture and project performance in the construction industry of the United Arab Emirates (UAE) based on a work-practice perspective. A total of 124 recently concluded construction projects in the UAE were examined to determine the relationship between project culture and performance through specific data gathering through questionnaires. The significant positive relationship between project organizational culture and project performance has been made clear in this paper. The findings reveal that contractor commitment-related factors are the most important cultural factor influence overall project performance, while authority-related factors which was ranked a lowest impact on project performance. The findings of this study help professionals in the construction industry put practices in place to improve the culture at the project level, which can help to improve the performance and success of construction projects.

Keywords Project organizational culture · Project performance · Construction industry · Project management

1 Introduction

The United Arab Emirates (UAE) economy has achieved high rankings across a number of economic metrics in prestigious global reports. In last and current years, construction industry represents a vital sector in UAE economy [1]. The construction industry in this county is a fastest developing and growing in Middle East and Gulf

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region and has booming in construction field during the recent years as many of mega projects have been undertaken for both public and private sectors in different fields like, infrastructure projects, residential and commercial buildings, hospitalities, factories, and schools. The UAE government spent around USD 414 billion on construction industry between 2005 and 2016 [2]. According to the Annual Economic Report of government of the United Arab Emirates (UAE) issued in 2018, the construction and building industry contributed by 8.7% from the total Gross Domestic Product (GDP) which represents with an amount to approximately USD 33.6 billion in 2017 compared to USD 33.36 billion at the end of 2016 [1]. Under such huge spending by the government of the UAE in the construction sector, any poor performance of construction projects will have a negative impact of UAE economy.

The construction projects performance has been reported by the following problems: schedule delay, over budget, poor quality, poor construction safety, client dissatisfaction, poor labor productivity, and contractor dissatisfaction with the profitability [3]. To enhance the performance of the project, the factors that might affect the success or failure of construction projects must be identified. The construction projects Critical Success Factors (CSFs) have been studied by many of literature over the years [4–7]. CSFs related to construction project management are: project-related factors, project management actions, project procurement procedures, external environment, and project culture [4–10]. To achieve the organizational objectives, management should pay significant and constant attention to CSFs factors [6]. Culture area has received much attention by researchers since it has been observed its influence on the performance of an organization [11, 12]. In terms of business success of any organization, culture treated as a major concern [13]. The culture is crucial to improving project performance [14]. The many CSFs that have been investigated in the project management domain include elements related to managerial support, communication, relationships, participant involvement and decision-making, all of which may be regarded as “cultural” elements relating to attitudes and behavior of participants in the project delivery process [5, 7, 8, 15].

The project organization is typically formed temporarily for the duration of the project delivery, project organizational members are gathered from various entities, and typically the product is one-off, all of which are claimed to distinguish project organizations in the construction industry from conventional organizations. As a result, despite its significance, it presents a challenge to project participants in understanding project organization culture. Further research is necessary to confirm the project’s organizational culture as a significant factor affecting project performance [14]. Furthermore, given the distinctive nature of the construction sector and project organization, the project environment may have a significant impact on participant behaviors. Also, it is thought that cultural differences can lead to interpersonal communication conflicts, which reduce construction organizations’ capacity to meet project objectives. Therefore, it is thought that cultural differences can lead to interpersonal communication conflicts, which reduce construction organizations’ ability to meet project objectives [8]. It will be worthwhile to assess the impact of project organizational culture on the performance of construction projects from a work-practice perspective in the UAE’s construction project organization because it is run

by numerous individuals with diverse backgrounds, which causes different human behavior as well as different expectations for the project.

2 Literature Review

2.1 Project Performance Factors

Measurement methods of performance in construction industry have influenced on many public and private clients, as well as government sectors, construction firms, and other project stakeholders. The regular reporting and gathering of data about the inputs, efficacy, and efficiency of construction projects is typically referred to as performance measurement [8]. There are two models that have been developed to assess the performance of construction projects: Integrated Performance Index [16] and Key Performance Indicators [3]. The Integrated Performance Index was developed by Pillai et al. [16] to measure the performance of Research and development (R&D) projects. In UK construction industry, the Key Performance Indicators (KPIs) were used to measure the project performance based on 10 identified parameters. These parameters pertaining to project performance were seven (7) indicators, while the company performance was there (3) indicators. The following project performance indicators were used: cost, time, predictability of costs and times, defects, customer satisfaction with the product and service. The three key performance indicators for a company are productivity, profitability, and safety [3]. The use of those key performance indicators for a company is to assess their organizational performance [11]. In many industries, they used industry-specific KPI systems to measure process performance, which is essential to an organization's success. Despite being widely used, KPIs appear to be better suited for assessing performance at the project level [17]. The construction projects performance have been reported with the following problems: schedule delay, over budget, poor quality, poor construction safety, client dissatisfaction, poor labor productivity, and contractor dissatisfaction with the profitability [3]. The construction projects Critical Success Factors (CSFs) have been studied by many of literature over the years [4–7]. CSFs related to construction project management are: project-related factors, project management actions, project procurement procedures, external environment, and project culture [4–10]. In order to achieve organizational objectives, management should pay significant and constant attention to CSFs factors [6].

2.2 Definition of Culture, Organizational Culture, and Project Organizational Culture

Definition of Culture

Culture topic has in project management received much attention by researchers since it has been observed its influence on the performance of an organization [11, 12]. Studies have looked into the effects and influences of culture at various levels, including those of industry, nation, organization, and profession [8]. Culture is one of the English language's most complicated words according to many of studies as it touches on many processes and topics due to its complexity and divergently in its applications [18], and the word is defined in different ways based on the field of research where it is studied. The social structure developed by a group of people, known as their culture, is characterized by shared norms, values, practices, perspectives, and rituals [19]. The culture of the construction sector is influenced by the sector's characteristics, construction methods, worker competency, and the objectives, principles, and tactics of the organizations they work for [20]. Culture is major concern in terms of business success of any organization [13].

Definition of Organizational Culture (OC)

Culture has been studied by sociologists and anthropologists for a long time resulting many definitions and models of culture [21]. The organizational culture concept of has received increasing significant attention recent years both from academics and practitioners because it provides a better understanding of how to create a strong culture that will address some productivity issues while also improving an organization's performance [22]. Organizational culture definition according to E. H. Schein [21], the definition of group culture is "the accumulated shared learning of that group as it solves its problems of external adoption and internal integration, which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, feel, and behave in relation to those problems". In general, the culture can be analyzed at different levels based on cultural phenomenon is visible to you as observer or participant. Culture has three major levels (Table 1) are: artifacts, espoused values and believes, and basic underlying assumption.

It is also possible to define the organizational culture an organization's culture reflects assumptions about clients, employees' goals, products, and activities as well as assumptions that have previously worked well. These assumptions are translated into behavioral norms and expectations about what is proper, preferable behavior [23, 24]. According to Stanford [13], the "Organizational culture is an organizationally specific 'experience' felt both subjectively and individually by insider and outsider". The values and beliefs that guide behavior in an organization are another definition of organizational culture [20]. From the viewpoint of work practices, the organizational culture is defined as specific methods of carrying out organizational functions that have developed over time. These practices serve as a reflection of the organization's collective knowledge and skill [25]. According to the definition

Table 1 Culture three levels [21]

<p>1. Artifacts (Difficult to decipher)</p> <ul style="list-style-type: none"> • Visible and feelable structures and procedures of the organization
<p>2. Espoused values and beliefs (Congruence with behavior and other artifices may or may not exist)</p> <ul style="list-style-type: none"> • Values, goals, ideals, aspirations • Ideologies • Rationalizations
<p>3. Basic underlying assumption (Determine perceptions, behavior, feeling, and thought)</p> <ul style="list-style-type: none"> • Unconscious, accepted values and beliefs

of organizational culture, each organizational unit has a unique perception of how certain work practices should be carried out [26].

Definition of Project Organizational Culture (POC)

As there are a few studies that have discussed this idea, the project-based construction industry needs to have more understanding of cultural issues at the project level and their impact and influence on the participants' satisfaction of construction projects. The general attitude toward projects within the company is known as project culture [12]. The organization for a construction project is defined as the set of interrelationships, responsibilities, and authorities that are established between the contributors (the client, the consultant, and the contractor) in order to accomplish the goals of the construction client [27]. The nature of construction industry is a labor-intensive business from many and different companies. In this industry, the projects are accomplished by having the right people in the right positions, effective communication through multiple lines of responsibility. But this effective communication becomes an issue when the basic assumptions not shared properly, and their organizational cultures do not match. According to some studies, the culture of the construction industry differs significantly from that of other industries. The construction industry has a unique culture as a result of its unique business environment, which includes: fixed project durations, geographically dispersed construction, highly itinerant laborers, dynamic site management, and numerous companies and organizations that must collaborate on the project [28]. Therefore, it is not possible to transfer management tools from one industrial sector to another without substantial redesign. This fact substantiates the need for the research in organizational culture in construction projects itself [28].

2.3 The Relationship Between Project Organizational Culture and Project Performance

In Vietnam, Cheung et al. [14] investigated the relationship between the project organizational culture and the procurement approach by using a project-specific data

based on field study of industry which were collected from 199 completed construction projects and the literature review by exploring the cultural artifacts at project level based on work-practice perspective. The five groups that make up the project's cultural factors are as follows: (1) Goal alignment and trust are represented by the following cultural artifacts: objective understanding, roles and responsibilities of the constructor and client, mutual understanding, information sharing, project manager encouragement, mutual trust sharing, importance of people's contributions, opportunity provided, commitment of supervision, and leadership on the part of leaders. (2) The constructor's commitment, which is symbolized by the cultural artifacts below, includes the constructor's commitment to quality, schedule, and budget. (3) A focus on cooperation is demonstrated by the following cultural artifacts: an expectation of project benefits, productive working relationships, mutual respect, and openness. Exchange support and ideas, blame the client's adherence to agreements, leaders' guidance, pride and celebration, assignment and accountability, and decision-making involvement. (4) Leadership commitment, as evidenced by the following cultural artifacts: assignment of empowerment, encouragement of decision-making, and leaders' direction. (5) Worker orientation, as shown by the following cultural artifacts: training sessions, respect for workers, and worker-related concerns. The study has made clear a significant relationship between procurement characteristics and project organizational culture. Additionally, the findings may help to improve the culture of the project, which is then anticipated to improve project performance. In Chinese construction firm, Wei and Miraglia [29] conducted an empirical investigation in a project-based organization at a Chinese construction company to look at how shared beliefs, norms, and artifacts, the three main components of organizational culture, affect knowledge transfer between projects. The study's findings show how cultural factors at lower organizational levels interact with corporate-level organizational culture to influence people's decisions about which types of knowledge are most crucial to transfer, how much knowledge can be hoarded or shared, and under what circumstances. In Vietnam, Nguyen, and Watanabe [8] conducted research to ascertain the impact of project organizational culture on the performance of construction projects by examining the cultural artifacts at the project level from the perspective of work-practice for completed construction projects. The five groups that make up the project's cultural factors are as follows: (1) Goal alignment and reliance as demonstrated by the following cultural artifacts: clarifying objectives, contractor and client roles and obligations, shared comprehension, information sharing, support for the project manager, mutual reliance, appreciating the contributions of others, seizing opportunities, commitment from supervisors, and leadership from leaders. (2) The commitment of the contractor, as evidenced by the cultural artifacts of the contractor's commitment to budget, schedule, and quality. (3) Cooperative orientation is exemplified by the following cultural artifacts: commitment to project benefits, effective working relationships, openness and respect for one another, sharing of ideas and support, accountability and attribution of blame, acknowledgment of accomplishments, client adherence to agreements, leaders' guidance, and participation in decision-making. (4) A focus on empowerment is exemplified by the following cultural artifacts: empowering assignments encouragement of leadership

direction and decision-making. (5) Worker orientation, as evidenced by the following cultural artifacts: training sessions, respect for workers, and worker concern. The following performance indicators were used in the research: (1) Participant satisfaction, which is derived from the following five sub-measurements: contractor satisfaction with profitability, contractor satisfaction with quality, client satisfaction with schedule, client satisfaction with cost. (2) The output of labor. (3) Knowledge gained. (4) Overall effectiveness. According to the study's findings, goal alignment and reliance, worker orientation, contractor commitment, and commitment to contract agreements are the cultural factors that have the greatest impact on project performance. These factors also helped to increase overall performance and participant satisfaction. While goal alignment, trust, and contractor commitment ensure learning performance, cooperative behavior and contractor commitment increase labor productivity. In Hong Kong, Cheung et al. [11] conducted a study to clarify the connection between organizational culture (OC) and the effectiveness of construction organizations with regard to project-based organizational culture. In this study's literature review, the researcher identified a short list of artifacts that correspond to OC identifiers and performance. The four performance indicators are financial, internal business process, custom, and innovation and learning, while the eight OC are goal clarity, coordination and integration, conflict resolution, employee participation, innovation orientation, performance emphasis, reward orientation, and team orientation. According to the study's findings, innovation is the OC that will have the biggest impact on how well construction organizations perform. This outcome emphasizes the requirement for a culture that promotes creativity and encourages innovation. Researcher Choi et al. [20] conducted a thorough review of the literature on the cultural aspects of the construction industry to determine the knowledge gaps in this area. The conclusion of this review was that cultural factors in the construction industry merit considerable research attention because they can increase an organization's or project's effectiveness. Additionally, this review has summarized the research on the following topics: organizational culture, cultural factors and differences, the influence of culture on contractual arrangements, and the impact of culture diversity. Author Arditi et al. [30] conducted research in the United States and India to examine the connection between construction companies' organizational cultures and delays. As per this study, the major causes of the delay were: subcontractors, poor planning and scheduling, inadequate contractor experience, late material deliveries, design changes during construction/Change orders, incomplete or improper designs, contractor financial difficulties, delays in contractor's payment by owner, a shortage of materials, equipment, and labor, and unanticipated geological conditions. According to the findings of this study, "market" culture is dominant in construction organizations in India compared to "clan" culture in the United States. The Competing Values Framework (CVF) tool, created by Cameron and Quinn, was the basis for the Organizational Culture Assessment Instrument (OCAI), a tool used by many researchers to measure organizational culture. According to OCAI, there are four main types of organizational culture: clan culture, adhocracy culture, hierarchy culture, and market culture. Clan culture places a high value on teamwork, participation, consensus, morale, and loyalty. Adhocracy culture encourages creativity,

experimentation, innovation, and individual initiative (focuses on getting the job done which brings goal-oriented competition along) [31]. In china, Zillante and Coffey [12] conducted research to ascertain the Chinese contractor's opinions regarding the effects of project culture issues on the project-level performance of local construction projects. According to the study's findings, a particular project culture has made a significant contribution to project success. The study also revealed that practitioners in the construction industry are very concerned with developing an appropriate project culture. In Slovenia, Stare [32] conducted research to determine the strength of the relationship between project organizational culture and project execution in Slovenian businesses. According to the study, project organizational culture has a significant impact on project performance. Additionally, it was noted that the growing authority of project managers has a positive effect on many cultural dimensions and a direct bearing on project success. A study was conducted by researcher Al-Gheth and Bin Ishak [33] to provide an overview of construction delays in order to classify and compare the major groups of delays in the UAE construction industry with studies from other countries. In this study, it was discovered that 14 different groups—including management contractors, financial clients, labor and equipment suppliers, outside factors, management consultants, design consultants, financial contractors, material, contract, project, authorities, and design contractors—were all involved in the delays in the construction process. According to international studies, the top five categories of project-affecting factors are management of contractors, client-related finances, client-related management, client-related labor and equipment, and external factors. In contrast, the top five categories in the United Arab Emirates were management related to contractors, management related to clients, financial factors related to contractors, financial factors related to clients, and labor and equipment. In the Kingdom of Saudi Arabia (KSA), Almathami [34] performed a study to investigate the current levels of productivity, existing barriers to productivity improvement, existing strategies for overcoming such barriers and the current organizational culture (OC) profiles of companies in the KSA construction industry. Also, the study examines the relationships between OC and productivity and the ways in which OC influences productivity. The research's findings showed that in the KSA's construction sector, the strongest culture trait is "Adaptability" and the weakest is "Involvement". The dynamic tensions show that: OC in the KSA construction industry is stable more than flexible, tends to be external adaptation than internal integration focused, OC is a top-down management structure, and OC responds to the construction market rather than developing systems and processes. In the United Arab Emirates, Ren et al. [35] conducted research in Dubai to determine the major reasons for construction project delays. The client, the consultant, or the contractor, in turn, each contributed to the causes of the project delays. The client's top five causes of delays were: an inflated project timeline, excessive use of prime costs and provisional funds, selection of suppliers and subcontractors, irregular client payments to the main contractor, and variations. The consultant's main causes included incomplete drawings, a delay in document approval, missing contract documents, changes to the drawings and specifications, and the length of the inspection process. The contractor's preparation

of the method statements, a poorly funded project, poor organizational management, choppy external and internal communications, and construction errors was the main contributors to the problem. The findings of this study indicate that a variety of factors, including unrealistic project duration, designated subcontractors, and cultural influences, were the primary causes of delays.

3 Materials and Methods

3.1 Research Design and Data Collection

This study investigated any connections that might exist between project organizational culture and project performance in the UAE construction industry by using a mixed-methods approach. Data collection was from a detailed analysis of the literature and from experience key project participants (clients, contractors, and consultants) who were involved with construction projects in UAE. 13 participants were interviewed as part of the first stage's primary role of project managers or senior managers/engineers. Then, to ensure that the instructions were clear, and the questions had reasonable contents, a pilot study was conducted using a tentative questionnaire model and those participants. Lastly, the questions were divided into the following four parts: (1) general information of respondents; (2) the description of culture factors and cultural artifacts related to the project organizational culture, (3) project performance indicators, and (4) invited respondents to contribute to an open discussion and make comments. A questionnaire survey has been conducted randomly to project practitioners who worked on construction projects in UAE and play the role of Managing Director, Area Manager, Projects Manager, Project Director, Project Manager, Project Engineer and Resident Engineer for clients, contractors, and consultants. As a part of the information collection for the study, 200 sets of questionnaires were given out to project participants. These questionnaires were distributed via email, social media, and interviews. To remind and nudge the participants to respond to the questionnaires, follow-up phone calls and messages will also be a supported tool. A 5-point Likert scale with a range of one (strongly disagree/not at all satisfied) to five (strongly agree/extremely satisfied) was used to collect responses from participants regarding the most recent project they had worked on [8]. A total of 137 responses were received, in which 124 samples were valid enough to be analyzed, representing an effective rate of 62%. Among the valid questionnaires, 26.6% were from Clients/Clients representative, 40.3% were from consultants and 33.1% were from Contractors. Regarding the organization sector of participants, 16.1% were from public sector and 83.9% were from private sector. Furthermore, 67.7% were from national (Local) organizations and 32.3% were from international organizations. Regarding the type of the project, 62.9% were buildings projects, 8.9% were villas projects, and 28.2% were infrastructure projects. Regarding participant position, 4.0% were Managing Director, 8.9% were Area Manager, 22.6% were

Projects Manager, 1.6% were Project Director, 37.9% were Project Manager, 19.4% were Project Engineer, and 5.6% were Resident Engineer. Furthermore, 36.3% of participants years of experience were above 20 years, 31.5% were 16–20 years, 15.3% were 11–15 years, 14.5% were 5–10 years and 2.4% were less than 5 years. Table 2 gives 8 cultural factors along with 66 cultural artifacts of project organizational culture and Table 3 gives 8 project performance indicators which comes as a result of detailed analysis of literature and interviews.

3.2 Analytical Methods

The collected data from the questionnaire survey was analyzed using the Statistical Package for the Social Sciences (SPSS) software version 26.0. The general information of respondents, as well as the standard deviation and mean score, was examined using descriptive statistics (Frequencies and Destructives). The reliability of all the items in this study was ensured using the Cronbach's alpha coefficient threshold. Alpha values range from 0 to 1, with higher values indicating more reliable groupings. In reliability testing, a Cronbach's alpha value greater than 0.7 is regarded as "good" or "acceptable" [8, 14]. Utilizing Pearson's correlation coefficient, linear correlation was used to analyze the relationship between the independent and dependent variables. The Pearson's correlation coefficient value between a range of 0 and 1. A higher value indicates greater correlation between the variables [14, 36].

4 Results and Discussion

4.1 Project Organizational Culture Factors (Project Culture)

The culture factors scores were calculated based on the average mean scores of each cultural artifact-related factors based on their scores for the scale of five. Results given in Table 4. These scores indicate that the factors are above-average identifiers of project organizational culture in the construction industry of the UAE. According to ranking of these scores, the consultant commitment-related factors was ranked highest (3.7809), then worker orientation-related factors (3.5269), then client commitment-related factors (3.5113), then goal alignment and reliance-related factors (3.4803), then cooperative orientation-related factors (3.4098), then contractor commitment-related factors (3.4000), then authority-related factors (3.2608) and then empowerment orientation-related factors (3.2446) which was ranked lowest. The Cronbach's alpha value was found to be 0.981, which is considered a very acceptable internal consistency reliability of extracted factors.

Table 2 Cultural factors and artifacts of project organizational culture

No.	Project cultural factors (PCFs)	Cultural artifacts (CA)
1	Client commitment-related factors (CF1)	<ol style="list-style-type: none"> 1. Client commitment to contract agreement 2. Roles and obligations of client 3. Client releasing the decisions/approvals of submissions on time 4. Changes orders/request new requirements by client 5. Client qualified site staff 6. Client approval for contractor’s variations claims 7. Client nominates qualified nominated subcontractors/ suppliers 8. Quality of material supplied by client 9. Delivery of material supplied by client 10. Client releasing the contractor’s payments on time
2	Consultant commitment-related factors (CF2)	<ol style="list-style-type: none"> 11. Consultant commitment to agreement 12. Roles and obligations of consultant 13. Consultant releasing the approvals of inspections on time 14. Consultant releasing the decisions on time 15. Consultant releasing the contractor’s submission on time 16. Consultant qualified site staff 17. Consultant approval for the quality material 18. Consultant site supervision 19. Consultant review of contractor’s variations claims 20. Design drawings and specifications issued by consultant 21. Incorporate all authority’s regulations and requirements on drawings and specifications by consultant 22. Contract document prepared by consultant
3	Contractor commitment-related factors (CF3)	<ol style="list-style-type: none"> 23. Contractor commitment to contract agreement 24. Roles and obligations of contractor 25. Contractor submissions on time 26. Contractor commitment to schedule 27. Contractor commitment to budget 28. Contractor commitment to quality 29. Contractor qualified site staff 30. Contractor proper site planning 31. Contractor managing and controlling the site 32. Contractor submits qualified subcontractors/suppliers 33. Contractor controlling subcontractors/suppliers 34. Submission of Quality materials by contractor 35. Executing the approved variations orders by contractor 36. Contractor takes all safety requirements and precautions at site 37. Contractor releasing subcontractor’s/supplier’s payments on time

(continued)

Table 2 (continued)

No.	Project cultural factors (PCFs)	Cultural artifacts (CA)
4	Goal alignment and reliance-related factors (CF4)	38. Objective understanding and clarifying 39. Shared understanding 40. Information exchanging 41. Encouraging of project manager 42. Coordination between project participants 43. Mutual trust and reliance 44. Value of people's contributions 45. Available opportunities 46. Leader's leadership
5	Cooperative orientation-related factors (CF5)	47. Project benefits commitment 48. Effective working interactions 49. Effective team works 50. Openness and mutual respect 51. Controversy arises 52. Exchanges of ideas and support 53. Accountability and assignment of blame 54. Recognition of achievements 55. Leader's instruction and guidance 56. Involvement in decision-making 57. Communication between project participants
6	Empowerment orientation-related factors (CF6)	58. Empowering assignments 59. Encouragement of decision-making 60. Leader's direction
7	Worker orientation-related factors (CF7)	61. Training sessions 62. Respect for workers 63. Concern for workers
8	Authority-related factors (CF8)	64. Authority releasing the NOCs/submission/inspections approval on time 65. Changes in the authority's regulations and requirements 66. Authority procedures to get services connections

Table 3 Project performance indicators

No.	Performance indicators employed
1	Client satisfaction with quality
2	Client satisfaction with schedule
3	Client satisfaction with cost
4	Participants satisfaction with safety
5	Contractor satisfaction with profitability
6	Labor productivity
7	Lessons learned
8	Overall performance

Table 4 Scores of projects organizational culture factors

No.	Project cultural factors (PCF)	Cultural artifacts (CA)	Mean of score (Cultural artifacts)	Mean of score (Cultural factors)
1	Client commitment-related factors (CF1)	1. Client commitment to contract agreement	3.5726	3.5113
		2. Roles and obligations of client	3.6210	
		3. Client releasing the decisions/ approvals of submissions on time	3.4677	
		4. Changes orders/request new requirements by client	3.2339	
		5. Client qualified site staff	3.6774	
		6. Client approval for contractor's variations claims	3.1613	
		7. Client nominates qualified nominated subcontractors/suppliers	3.5726	
		8. Quality of material supplied by client	3.7903	
		9. Delivery of material supplied by client	3.5726	
		10. Client releasing the contractor's payments on time	3.4435	
2	Consultant commitment-related factors (CF2)	11. Consultant commitment to agreement	3.8065	3.7809
		12. Roles and obligations of consultant	3.9839	
		13. Consultant releasing the approvals of inspections on time	3.8871	
		14. Consultant releasing the decisions on time	3.7823	
		15. Consultant releasing the contractor's submission on time	3.8629	
		16. Consultant qualified site staff	3.8710	
		17. Consultant approval for the quality material	3.9274	
		18. Consultant site supervision	3.9355	
		19. Consultant review of contractor's variations claims	3.6694	
		20. Design drawings and specifications issued by consultant	3.5081	
		21. Incorporate all authority's regulations and requirements on drawings and specifications by consultant	3.5000	
		22. Contract document prepared by consultant	3.6371	

(continued)

Table 4 (continued)

No.	Project cultural factors (PCF)	Cultural artifacts (CA)	Mean of score (Cultural artifacts)	Mean of score (Cultural factors)
3	Contractor commitment-related factors (CF3)	23. Contractor commitment to contract agreement	3.5323	3.4000
		24. Roles and obligations of contractor	3.5968	
		25. Contractor submissions on time	3.2903	
		26. Contractor commitment to schedule	3.2984	
		27. Contractor commitment to budget	3.3065	
		28. Contractor commitment to quality	3.3871	
		29. Contractor qualified site staff	3.3629	
		30. Contractor proper site planning	3.4597	
		31. Contractor managing and controlling the site	3.4516	
		32. Contractor submits qualified subcontractors/suppliers	3.4194	
		33. Contractor controlling subcontractors/suppliers	3.4274	
		34. Submission of quality materials by contractor	3.5565	
		35. Executing the approved variations orders by contractor	3.3871	
		36. Contractor takes all safety requirements and precautions at site	3.5242	
37. Contractor releasing subcontractor's/supplier's payments on time	3.0000			
4	Goal alignment and reliance-related factors (CF4)	38. Objective understanding and clarifying	3.4032	3.4803
		39. Shared understanding	3.3871	
		40. Information exchanging	3.5242	
		41. Encouraging of project manager	3.6855	
		42. Coordination between project participants	3.5000	
		43. Mutual trust and reliance	3.3871	
		44. Value of people's contributions	3.5161	
		45. Available opportunities	3.3710	
5	Cooperative orientation-related factors (CF5)	46. Leader's leadership	3.5484	3.4098
		47. Project benefits commitment	3.2339	
		48. Effective working interactions	3.3387	
		49. Effective team works	3.4597	
		50. Openness and mutual respect	3.6452	

(continued)

Table 4 (continued)

No.	Project cultural factors (PCF)	Cultural artifacts (CA)	Mean of score (Cultural artifacts)	Mean of score (Cultural factors)
		51. Controversy arises	3.4516	
		52. Exchanges of ideas and support	3.5323	
		53. Accountability and assignment of blame	3.2742	
		54. Recognition of achievements	3.3226	
		55. Leader’s instruction and guidance	3.4274	
		56. Involvement in decision-making	3.3065	
		57. Communication between project participants	3.5161	
6	Empowerment orientation-related factors (CF6)	58. Empowering assignments	3.0968	3.2446
		59. Encouragement of decision-making	3.1855	
		60. Leader’s direction	3.4516	
7	Worker orientation-related factors (CF7)	61. Training sessions	3.4274	3.5269
		62. Respect for workers	3.6371	
		63. Concern for workers	3.5161	
8	Authority-related factors (CF8)	64. Authority releasing the NOCs/ submission/inspections approval on time	3.2984	3.2608
		65. Changes in the authority’s regulations and requirements	3.0806	
		66. Authority procedures to get services connections	3.4032	

4.2 Analysis of Variance (Compare Means)

In the construction industry, the representativeness of the identified factors of organizational culture may vary across participant organizations because the clients, consultants, and contractor organizations have different backgrounds and business objectives. Therefore, a comparison of means was conducted in order to determine if there is a significant difference in the perceived significance of the identified factors of project organizational culture between the three groups of project participants: clients, consultants, and contractors. The results are given in Table 5 which explain significance scores of the eight project organizational culture factors are all greater than 3.0 on a 5-point Likert scale which indicates that these factors as appropriate to identify project organizational culture in construction industry. The studies compared means results show that despite the three types of participant’s affiliation with various types of organizations, there is no evidence to suggest that they have divergent opinions on project organizational culture.

4.3 The Relationship Between Project Organizational Culture and Project Performance

Using linear correlation, the relationship between cultural factors and project performance was examined. Analysis of the relationship between the variables was done using Pearson's correlation coefficient. Outputs (Table 6) were obtained. Project organizational culture and project performance are significantly positively correlated, as given in Table 6 (Pearson's correlation coefficient is 0.774). The findings reveal that contractor commitment-related factors are the most significant cultural factor influencing the overall project performance (Pearson's Correlation coefficient 0.819), then cooperative orientation-related factors (Pearson's Correlation coefficient 0.792), then worker orientation-related factors (Pearson's Correlation coefficient 0.755), then goal alignment and reliance-related factors (Pearson's Correlation coefficient 0.732), then empowerment orientation-related factors (Pearson's Correlation coefficient 0.626), then client commitment-related factors (Pearson's Correlation coefficient 0.504), then consultant commitment-related factors (Pearson's Correlation coefficient 0.366), then, authority-related factors which was ranked a lowest impact on project performance (Pearson's Correlation coefficient 0.192). Figure 1 represent scatter diagram of the correlation between project cultural factors and project performance.

5 Conclusion

This study was carried out to empirically identify the project organizational culture factors from the work-based practice perspective that is grounded in the challenges encountered throughout the UAE construction industry. The relationship between the project organizational culture and project performance has been investigated using statistical analysis. This study shown that despite the three types of participant's affiliation with various types of organizations, there is no evidence to suggest that they have divergent opinions on project organizational culture in construction industry of UAE. The findings of this study have clarified that there is a significant positive relationship between project organizational culture and project performance. The findings reveal that contractor commitment-related factors are the most significant cultural factor affecting overall project performance, then cooperative orientation-related factors, then worker orientation-related factors, then goal alignment and reliance-related factors, then empowerment orientation-related factors, then client commitment-related factors, then consultant commitment-related factors, then authority-related factors which was ranked a lowest impact on project performance. The findings of this study help those working in the construction industry to put practices in place that will enhance project level culture and ultimately improve the performance and success of construction projects.

Table 6 Correlation coefficient value

		Client satisfaction with quality	Client satisfaction with schedule	Client satisfaction with cost	Participants satisfaction with safety	Contractor satisfaction with profitability	Labor productivity	Lessons learned	Overall performance
Client commitment-related factors (CF1)	Pearson Correlation	0.460**	0.447**	0.404**	0.381**	0.438**	0.345**	0.422**	0.504**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Consultant commitment-related factors (CF2)	Pearson Correlation	0.380**	0.312**	0.217*	0.317**	0.380**	0.279**	0.234**	0.366**
	Sig. (2-tailed)	0.000	0.000	0.015	0.000	0.000	0.002	0.009	0.000
Contractor commitment-related factors (CF3)	Pearson Correlation	0.760**	0.710**	0.670**	0.700**	0.492**	0.682**	0.719**	0.819**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Goal alignment and reliance-related factors (CF4)	Pearson Correlation	0.732**	0.618**	0.587**	0.581**	0.535**	0.528**	0.635**	0.732**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

(continued)

Table 6 (continued)

		Client satisfaction with quality	Client satisfaction with schedule	Client satisfaction with cost	Participants satisfaction with safety	Contractor satisfaction with profitability	Labor productivity	Lessons learned	Overall performance
Cooperative orientation-related factors (CF5)	Pearson Correlation	0.739**	0.649**	0.656**	0.640**	0.537**	0.638**	0.719**	0.792**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Empowerment orientation-related factors (CF6)	Pearson Correlation	0.644**	0.571**	0.545**	0.434**	0.459**	0.429**	0.503**	0.626**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Worker orientation-related factors (CF7)	Pearson Correlation	0.666**	0.576**	0.594**	0.687**	0.519**	0.619**	0.721**	0.755**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Authority-related factors (CF8)	Pearson Correlation	0.150	0.164	0.171	0.158	0.308**	0.074	0.065	0.192*
	Sig. (2-tailed)	0.097	0.068	0.058	0.079	0.000	0.417	0.475	0.033
Culture factors	Pearson Correlation	0.730**	0.654**	0.623**	0.633**	0.593**	0.582**	0.650**	0.774**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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

* Correlation is significant at the 0.05 level (2-tailed)

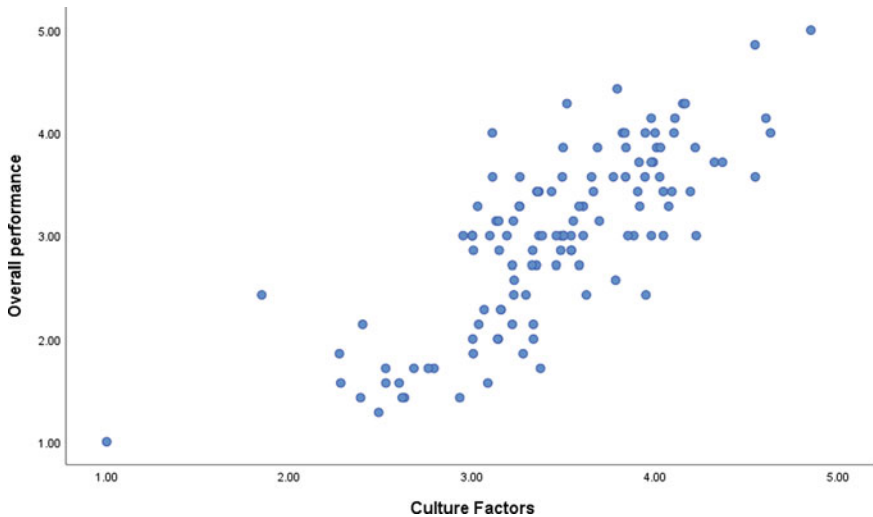


Fig. 1 Scatter diagram of the correlation between project cultural factors and project performance

References

1. U. Ministry of Economy: Annual Economic Report of government of the United Arab Emirates (UAE), Abu Dhabi, United Arab Emirates (UAE) (2018)
2. Algheth, A., Sayuti, M.I.: Contributing factors to schedule delays in construction projects in the United Arab emirates. *Int. J. Eng. Adv. Technol.* **8**(6, Special Issue 3), 422–433 (2019). <https://doi.org/10.35940/ijeat.F1076.0986S319>
3. Takim, R., Akintoye, A.: Performance indicators for successful construction project performance. In: 18th Annual ARCOM Conference, vol. 2, no. September, pp. 545–555 (2002)
4. Alias, Z., Zawawi, E.M.A., Yusof, K., Aris, N.M.: Determining critical success factors of project management practice: a conceptual framework. *Procedia. Soc. Behav. Sci.* **153**, 61–69 (2014). <https://doi.org/10.1016/j.sbspro.2014.10.041>
5. Chan, A.P.C., Scott, D., Chan, A.P.L.: Factors affecting the success of a construction project. *J. Constr. Eng. Manag.* **130**(1), 153–155 (2004). [https://doi.org/10.1061/\(asce\)0733-9364\(2004\)130:1\(153\)](https://doi.org/10.1061/(asce)0733-9364(2004)130:1(153))
6. Fortune, J., White, D.: Framing of project critical success factors by a systems model. *Int. J. Project Manage.* **24**(1), 53–65 (2006). <https://doi.org/10.1016/j.ijproman.2005.07.004>
7. Chua, D.K.H., Kog, Y.C., Loh, P.K.: Critical success factors for different project objectives. *Engineering*, 142–150 (1999)
8. Nguyen, L.H., Watanabe, T.: The impact of project organizational culture on the performance of construction projects. *Sustainability (Switzerland)* **9**(5), 19–25 (2017). <https://doi.org/10.3390/su9050781>
9. Belout, A.: Effects of human resource management on project effectiveness and success: toward a new conceptual framework. *Int. J. Project Manage.* **16**(1), 21–26 (1998). [https://doi.org/10.1016/S0263-7863\(97\)00011-2](https://doi.org/10.1016/S0263-7863(97)00011-2)
10. Warrick, D.D.: What leaders need to know about organizational culture. *Bus. Horiz.* **60**(3), 395–404 (2017). <https://doi.org/10.1016/j.bushor.2017.01.011>
11. Cheung, S.O., Wong, P.S.P., Lam, A.L.: An investigation of the relationship between organizational culture and the performance of construction organizations. *J. Bus. Econ. Manag.* **13**(4), 688–704 (2012). <https://doi.org/10.3846/16111699.2011.620157>

12. Zou, J., Zillante, G., Coffey, V.: Project culture in the Chinese construction industry: perceptions of contractors. *Arsyad, Azhar* **9**(2) (2002)
13. Stanford, N., Organisation culture. Profile Books Ltd., London (2010)
14. Cheung, S.O., Wong, P.S.P., Lam, A.L.: An investigation of the relationship between project organizational culture and procurement approach of construction project organizations. *J. Bus. Econ. Manag.* **10**(1), 15–3292 (2015). <https://doi.org/10.3846/16111699.2011.620157>
15. Belassi, W., Tukel, O.I.: A new framework for determining critical success/failure factors in projects. *Int. J. Proj. Manage.* **14**(3), 141–151 (1996)
16. Pillai, A.S., Joshi, A., Rao, K.S.: Performance measurement of R and D projects in a multi-project, concurrent engineering environment. *Int. J. Proj. Manage.* **20**(2), 165–177 (2002). [https://doi.org/10.1016/S0263-7863\(00\)00056-9](https://doi.org/10.1016/S0263-7863(00)00056-9)
17. Kagioglou, M., Cooper, R., Aouad, G.: Performance management in construction: a conceptual framework. *Constr. Manag. Econ.* **19**(1), 85–95 (2001). <https://doi.org/10.1080/01446190010003425>
18. Hall, M.A., Jaggar, D.M.: Should construction enterprises, working internationally, take account of cultural differences in culture? In: 13th Annual ARCOM Conference, vol. 1, no. September, pp. 1–10 (1997)
19. Chan, E.H.W., Tse, R.Y.C.: Cultural considerations in international construction contracts. *J. Constr. Eng. Manag.* **129**(4), 375–381 (2003). [https://doi.org/10.1061/\(asce\)0733-9364\(2003\)129:4\(375\)](https://doi.org/10.1061/(asce)0733-9364(2003)129:4(375))
20. Choi, J.O., Gad, G.M., Shane, J.S., Strong, K.C.: Culture and organizational culture in the construction industry: a literature review. In: 5th International/11th Construction Specialty Conference, no. 173, pp. 1–9 (2015)
21. Schein, E.H.: *Organizational Culture and Leadership*, 5th edn. John Wiley & Sons, Inc., Hoboken, New Jersey, United States of America (2017)
22. Schein, E.H.: *Organizational Culture: What it is and How to Change it*. Palgrave Macmillan, London (1990)
23. Naoum, S.G., Alyousif, A.-R.T., Atkinson, A.R.: Impact of national culture on the management practices of construction projects in the United Arab Emirates. *J. Manag. Eng.* **31**(4), 04014057 (2015). [https://doi.org/10.1061/\(asce\)me.1943-5479.0000265](https://doi.org/10.1061/(asce)me.1943-5479.0000265)
24. Laurent, A.: The cultural diversity of western conceptions of management. *Int. Stud. Manag. Organ.* **13**, 75–96 (2003)
25. Kostova, T.: Transnational transfer of strategic organizational practices: a contextual perspective. *Acad. Manag. Rev.* **24**(2), 308–324 (1999). <https://doi.org/10.5465/AMR.1999.1893938>
26. Van Den Berg, P.T., Wilderom, C.P.M.: Defining, measuring, and comparing organisational cultures. *Appl. Psychol.* **53**(4), 570–582 (2004). <https://doi.org/10.1111/j.1464-0597.2004.00189.x>
27. Walker, A.: *Project Management in Construction*, 6th edn. John Wiley & Sons, Ltd., Chichester, UK (2015)
28. Riley, M., Brown, D.: Comparison of cultures in the construction and manufacturing. *J. Manag. Eng.* **17**(3), 149–158 (2001)
29. Wei, Y., Miraglia, S.: Organizational culture and knowledge transfer in project-based organizations: theoretical insights from a Chinese construction firm. *Int. J. Proj. Manage.* **35**(4), 571–585 (2017). <https://doi.org/10.1016/j.ijproman.2017.02.010>
30. Arditi, D., Nayak, S., Damci, A.: Effect of organizational culture on delay in construction. *Int. J. Proj. Manage.* **35**(2), 136–147 (2017). <https://doi.org/10.1016/j.ijproman.2016.10.018>
31. Cameron, K.S., Quinn, R.E.: *Diagnosing and Changing Organizational Culture: Based on the Competing Values Framework*, 3rd edn. John Wiley and Sons, San Francisco, CA, USA (2011)
32. Stare, A.: The impact of the organisational structure and project organisational culture on project performance in Slovenian enterprises. *Management* **16**(2), 1–22 (2011)
33. Al-Gheth, A., Bin Ishak, M.S.: Review of causes of delay in construction projects. *J. Comput. Theor. Nanosci.* **17**(2–3), 715–728 (2020). <https://doi.org/10.1166/jctn.2020.8710>

34. Almathami, K.Y.: *Organisational Culture and Productivity of the Construction Industry in the Kingdom of Saudi Arabia* (2020)
35. Ren, Z., Atout, M., Jones, J.: Root causes of construction project delays in Dubai. In: *Association of Researchers in Construction Management, ARCOM 2008—Proceedings of the 24th Annual Conference*, vol. 2, no. September, pp. 749–757 (2008)
36. Malik, N.S.A., Adeleke, A.Q.: The effect of organizational culture on material risk among Malaysian construction industries. *J. Adv. Res. Appl. Sci. Eng. Technol.* **10**(1), 34–40 (2018)