Organizational Culture in Construction: An Investigation of Trends and Practices in Large-Size Construction Companies

Arya Pradamansyah Putra, Kartika Puspa Negara, M Ruslin Anwar

Department of Civil Engineering, University of Brawijaya, Malang, INDONESIA

E-mail: aryapputrra@gmail.com

ABSTRACT

Construction companies are one of the business sectors that drive the Indonesian economy. The increase in construction companies has led to increased competition in the industry. Culture influences the construction process that applies to the company and the output of construction products. This study aims to find out how organizational culture practices and trends in the large-size construction companies. To investigate the organizational culture practices and trends, the literature study was used to develop a framework and the Competing Values Framework (CVF) through the Organizational Culture Assessment Instrument (OCAI) was adopted. The framework is also extended for each culture type, which are clan, adhocracy, hierarchy, and market into six-key dimensions. The population in this study was 26 large-size construction companies in East Java. The organizational culture practices results found that the dimensions of employee participation, innovation culture, reward, punishment, and teamwork orientation still need to be fully implemented (level 3). Meanwhile, the performance emphasis factor has been fully implemented (level 4). Furthermore, the trend of companies' culture types is clan culture, where the dominance of cultural types from the strongest to the weakest are clan, market, hierarchy, and adhocracy, with values of 27.51, 26.35, 24.87, and 21.27 respectively. This observation contributes to enriching the study of organizational culture in construction area.

Keywords: company; construction; culture assessment; framework; organizational culture.

INTRODUCTION

Studies in understanding organizational culture regarding construction management have increased significantly since 1990. This increase is due to interest in international business in the growing construction sector (Oney-Yazic et al., 2006). Organizational culture can be defined as the core beliefs, values, norms, and habits that direct how individuals act in an organization (Oney-Yazici et al., 2007). Culture in an organization is important to understand as a driver for achieving company goals. Externally, organizational culture can create a positive impression of the company, build harmonious relationships with stakeholders, and make it easier for the company to adapt to change (Tayeh et al., 2018). On the other hand, internally, organizational culture can be a tool for management control, which creates motivation and morale in individuals and increases productivity, efficiency, and innovation, which is beneficial to product results (Sun, 2009)

Indonesia has a significant increase in the construction business. East Java Province is the largest contributor to construction sector companies in Indonesia; starting from 2020 until the following year, the number of construction sector companies increased by 27.68%. Good management is needed to survive and succeed in an increasingly competitive construction business. The success of a construction project depends on smooth coordination between everyone in the company, which must minimize misunderstandings that give rise to risks and hostility (Nifa & Ahmed, 2010). Therefore, company management must investigate how each person interacts and influences performance outcomes (Nguyen & Watanabe, 2017).

This study aims to measure the organizational culture practiced in large-size construction sector companies. The results of this study will show the value level and cultural trends in the company. Comparisons with other cities and countries will also be conducted in this study.

Identify Dimensions of Organizational Culture Practices

Organizational culture has many interrelated dimensions, representing a perspective on organizational culture's value (Cheung et al., 2012). Dimensional studies measure how organizational culture is implemented or determine the correlation with other values (Stefanovska–petkovska et al., 2019). In this study, a literature study of previous research on organizational culture in the construction sector will be carried out to determine the dimensions of organizational culture. Further analysis was carried out by taking the average value of each value for the organizational culture dimension, where this value has five levels of implementation. The draft dimensions of organizational culture are summarized in Table 1. Organizational culture can be identified using six indicators: Employee Participation, Innovation Orientation, Performance Emphasis, Reward, Punishment, and Teamwork Orientation.

Table 1. Identification of Organizational Culture Dimensions

Organizational Culture Dimensions	Explanation	References
Employee Participation	The employees participate in discussions and decision-making process	Cheung et al., 2012; Dulaimi & Hartmann, 2006
Innovation Culture	The employees are encouraged to be creative and innovative in their work methods	Ozorhon & Oral, 2017; Xue et al., 2014; Dobni, 2008
Performance Emphasis	The company emphasizes employees on improving company performance	Nguyen & Watanabe, 2017; J. O. Choi et al., 2015; Cheung et al., 2012; Mohammed & Bin Ishak, 2024
Reward	The company provides rewards for contributions to the work that has been carried out	Nani & Apraku, 2016; Načinović et al., 2009; Luki Karunia, 2020; Faradisa & Martiana, 2021
Punishment	The company imposes punishment as a consequence of mistakes	Luki Karunia, 2020; Adeleke & Aziz, 2021; Zuo et al., 2008; Faradisa & Martiana, 2021
Teamwork Orientation	The company emphasizes teamwork in dealing with projects	Liu, 1999; Ibrahim et al., 2011; Yap et al., 2020

Table 1. identifies the dimensions of organizational culture. In project and construction management, companies should encourage employees to provide input into the decision-making process that affects work (Cheung et al., 2012). This is done so that employees have greater responsibility and commitment (Dulaimi & Hartmann, 2006).

Innovation is the key to increasing competitiveness in the construction industry, leading to increased company performance (Ozorhon & Oral, 2017). The success of innovation in construction companies can be supported through the company climate. Culture directly influences a creative and innovative company environment (Xue et al., 2014), including in the socialization process, communication, policies, and daily procedural practices (Dobni, 2008). Companies must also increase emphasis on a culture that focuses on company performance. The cultural behavior and attitudes of each individual in the company significantly impact project success (Nguyen & Watanabe, 2017). A strong culture will reduce uncertainty within the company, resulting in higher performance and higher levels of company satisfaction (J. O. Choi et al., 2015). This can be done by translating corporate cultural beliefs and values into policies and practices (Cheung et al., 2012).

Companies or construction business actors need to take a stance on project conditions. This is known as project culture (Zuo et al., 2008). Moreover, project culture has a significant relationship with company performance, so companies must determine the right people in the correct positions and communicate on every line element (Mohammed & Bin Ishak, 2024). Regardless of how the company positions a person according to their competence, characteristics and motivation are also needed to improve performance. Financial rewards often motivate employees to work harder in their performance. Workers are likelier to see rewards (salary, promotions, bonuses, or allowances) as the

most crucial thing that encourages them to work (Nani & Apraku, 2016). Innovation, culture, and the reward system also have a statistically significant relationship; this shows that companies can increase the innovation of each employee if a culture is embedded to appreciate every innovation and reward employee contributions (Načinović et al., 2009). However, other researchers recommend that companies consider balanced rewards and punishments as an excellent organizational structure (Luki Karunia, 2020). Both play a role in increasing the success of construction projects. A culture of fair punishment can encourage good leadership behavior, especially when handling large team groups (Adeleke & Aziz, 2021). Apart from helping improve performance, strengthening procedures and laws can prevent corruption within the company. Giving promotional rewards to workers can also be done (Zou, 2006). On the other hand, reward and punishment can also increase worker compliance in using personal protective equipment, thereby minimizing accidents in construction projects (Faradisa & Martiana, 2021).

The competitive nature of the environment in the construction industry causes an increasing need for integrating all project elements. Cultural differences between the three elements of a construction organization (client, consultant, and contractor) can cause company performance delays (Ren et al., 2008). Collaboration between elements has always been the basis for the success of construction projects (Ibrahim et al., 2011) (Yap et al., 2020). This collaboration is needed to respond to project changes. Companies that emphasize a team-oriented culture indicate professionalism and increase job satisfaction (Liu, 1999).

The Competing Values Framework of Organizational Culture

Many studies have developed frameworks to measure and identify organizational culture trends. One of the most popular frameworks used in many construction sector studies is the Competing Values Framework (CVF) by Cameron and Quinn in 1999. Four types of culture reflect a company, including (Cameron & Quinn, 2006):

1. Clan culture: a culture with an amicable work environment where people desire to share like family.
2. Adhocracy culture: a culture with a work environment that is highly dynamic, entrepreneurial, and encourages creativity.
3. Hierarchy Culture: a culture with a very formal and structured work environment.
4. Market culture: a culture with a highly competitive work environment oriented towards results and achievement.

The Organizational Culture Assessment Instrument (OCAI), an assessment tool derived from the CVF, has been adopted in this study to examine cultural trends. There are six dimensions in the measurement, i.e., the dominant characteristics (DC), organizational leadership (OL), management of employees (ME), organizational glue (OG), strategic emphasis (SE), and criteria of success (CS). A company's trend towards the four types of culture described above can be seen in each of these dimensions.

RESEARCH METHODS
Respondent and Data Analysis

An investigation to determine organizational culture in large-size companies in the construction sector was carried out by distributing questionnaires. The questionnaire contains a cover letter, an explanation of the research objectives, and forms that must be filled in, as well as privacy guarantees for respondents and the company to support the accuracy of the information. The structure of the questionnaire is divided into three parts: (i) General information about respondents, (ii) Assessment of organizational culture level according to specified indicators, and (iii) Assessment of cultural trends according to the specified framework.

This study distributed three questionnaires (qualified in top management and project structure) to 26 large East Java Province, Indonesia construction companies. Sixty-one respondents decided to join. The study was chosen in East Java Province because it has the largest population of construction companies in Indonesia, so it is hoped that it can represent the condition of organizational culture. The number of qualifications obtained for each respondent was two Company Directors, one

Technical Operation Manager, one Procurement Manager, two Finance Managers, one Business
Development Manager, eight Project Managers, five Site Managers, two Assistant Site Managers,
four Site Supervisors, one Quality Manager, seven Quality Control Inspectors, two Quality Health
Safety and Environment, nine Civil and Estimator Engineers, six Quantity Surveyors, two Project
Administration, one Cost Control, and one Drafter.

RESULT AND DISCUSSION
The Investigation of Organizational Culture Practices

The implementation level of organizational culture is assessed from the results of applying
dimensions that represent organizational culture practices in the company. These dimensions are
employee participation, innovation culture, performance emphasis, reward, punishment, and
teamwork orientation. The average value for each dimension will be grouped into four classes, where
an average of 1-2 is implementation level 1 (not yet implemented, an average of 2-3 is
implementation level 2 (minimally implemented), an average of 3-4 is implementation level is 3
(not fully implemented), and an average of 4-5 is implementation level 4 (fully implemented). The
investigation results into organizational culture practices will be described in Table 2 below.

Table 2. The Implementation Level of Organizational Culture Practices in Companies

Organizational Culture Practices	Mean	SD	95% Confidence Interval		Implementation Level
			Lower	Upper	
Employee Participation	3,96	0,94	3,73	4,18	3
Innovation Culture	3,96	0,88	3,75	4,17	3
Performance Emphasis	4,13	0,92	3,91	4,35	4
Reward	3,53	1,07	3,27	3,78	3
Punishment	3,74	1,03	3,50	3,99	3
Teamwork Orientation	3,97	0,85	3,77	4,17	3

The results of the descriptive analysis in Table 2 show the implementation level of organizational
culture practices in construction companies. It can be seen in the table that the majority of
organizational culture practices are still at implementation level 3. The dimensions of employee
participation, innovation culture, reward, punishment, and teamwork orientation in construction
companies have been implemented but still need to be optimized. In contrast to the performance
emphasis dimension, it is at implementation level 4, which indicates that this factor has been fully
implemented. From these results, large-size construction companies in East Java focus on having a
culture that emphasizes employee performance. Emphasis on performance is an appropriate culture
to develop in construction companies, considering that project success is the company's primary
goal. However, on the other hand, developing cultural practices in other dimensions also influences
project success (S. Choi et al., 2009) (Luki Karunia, 2020). Thus, companies should develop other
cultural dimensions to improve performance and ensure project success.

Result of Organizational Culture Assessment Instrument

The OCAI questionnaire assessment was developed by Cameron and Quinn (2006), where each
respondent will answer questions on a scale of 0 – 100 to determine their relationship to the six
cultural dimensions. The assessment score will be answered according to the cultural trends in
construction companies. The score results will be plotted on a spider web, where the highest score
indicates the most dominant cultural category in the company.
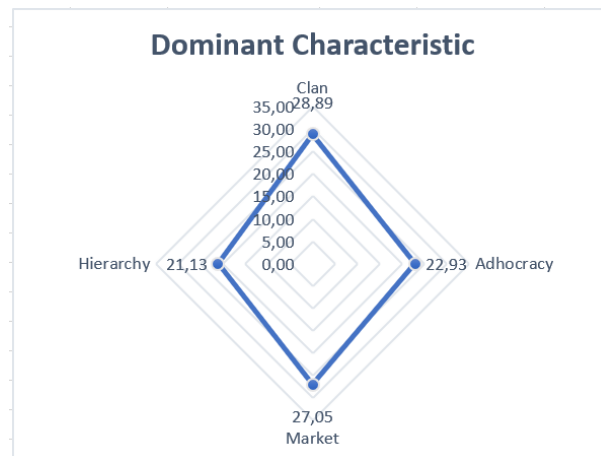
Figure 1. The Results of Cultural Trends on Dominant Characteristic Dimension

In Figure. 1, the trend in the dominant characteristic of large-size construction companies in East Java is dominant in clan culture, with an average value of 28.89. Furthermore, the second strongest cultural trend is market culture, with an average value of 27.05. The two weakest cultures are adhocracy culture, with an average value of 22.93, followed by hierarchy culture, with an average value of 21.13. The dominance of clan and market culture shows that the company has a close family culture, and the people in it share a mutual relationship. The company also has a results-oriented culture, with the people within it being very competitive.

Figure 2. The Results of Cultural Trends on Organizational Leadership Dimension

In Figure. 2, the trend in the organizational leadership culture of large-size construction companies in East Java dominate is dominant in market culture, with an average value of 26.41. Furthermore, the second strongest cultural trend is the hierarchy culture, with an average value of 26.25. The two weakest cultures are clan culture, with an average value of 25.31, followed by adhocracy culture, with an average value of 22.03. The dominance of market culture and hierarchy shows that leadership in the company has a culture that often coordinates with each other and focuses on efficiency. Additionally, company leadership tends to be aggressive, consistent, and results-oriented.
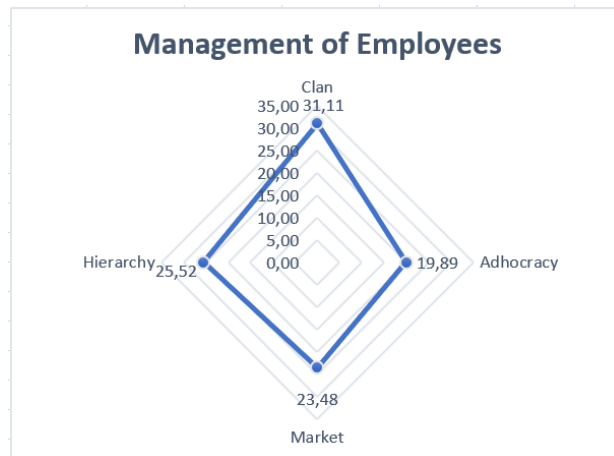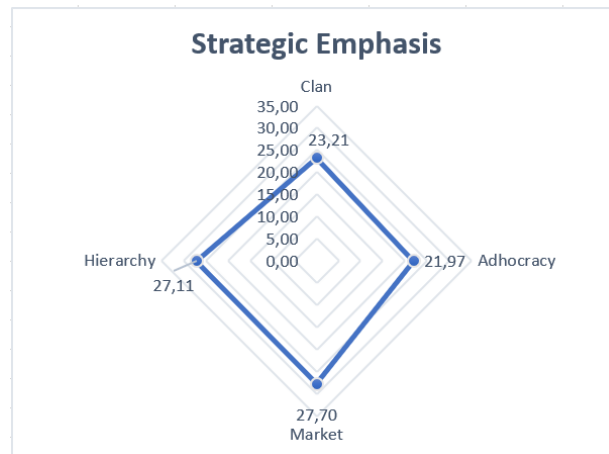
Figure 3. The Results of Cultural Trends on Management of Employees Dimension

In Figure. 3, the trend in the management of employees is dominant in clan culture, with an average value of 31.11. Furthermore, the second strongest cultural trend is hierarchy culture, with an average value of 25.52. The two weakest cultures are clan culture, with an average value of 25.31, followed by adhocracy culture, with an average value of 22.03. The dominance of clan and hierarchy culture shows that the company has a management style that is teamwork, consensus, and participative. Company management also tends to prioritize in work safety, conformity, and relationship stability.

Figure 4. The Results of Cultural Trends on Organizational Glue Dimension

In Figure. 4, the trend in the organizational glue of large-size construction companies in East Java is dominant in clan culture, with an average value of 30.79. Furthermore, the second strongest cultural trend is market culture, with an average value of 27.62. The two weakest cultures are adhocracy culture, with an average value of 22.28, followed by hierarchy culture, with an average value of 19.31. The dominance of clan and market culture shows that what organizational glue is a sense of loyalty, trust, and commitment to the company. On the other hand, organizational glue also depends on success and achievement of goals.
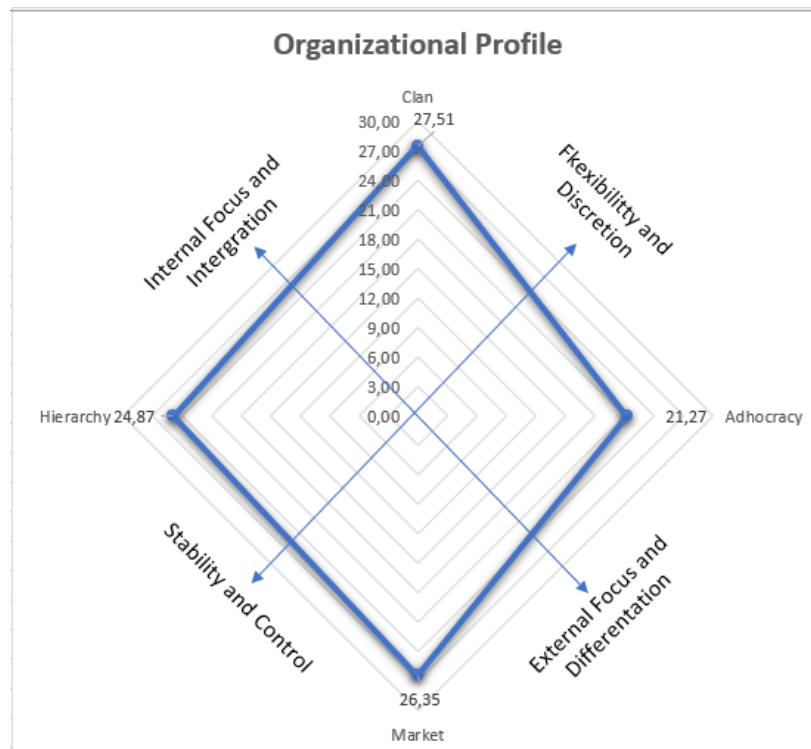
Figure 5. The Results of Cultural Trends on Strategic Emphasis Dimension

In Figure. 5, the trend in the strategic emphasis of large-size construction companies in East Java is dominant in market culture, with an average value of 27.70. Furthermore, the second strongest cultural trend is the hierarchy culture, with an average value of 27.11. The two weakest cultures are clan culture, with an average value of 23.21, followed by adhocracy culture, with an average value of 21.97. The dominance of market and hierarchy show that the company's strategy focuses on project success and victory in the market. The company's strategic emphasis is also on stability, control efficiency, and smooth operations.

Figure 6. The Results of Cultural Trends on the Criteria of Success Dimension

In Figure. 6, the trend in the criteria of success of large-size construction companies in East Java is dominant in hierarchy culture, with an average value of 29.92. Furthermore, the second strongest cultural trend is market culture, with an average value of 25.85. The two weakest cultures are clan culture, with an average value of 25.74, followed by adhocracy culture, with an average value of 18.49. The dominance of hierarchy and market culture shows that the company's success criteria are efficiency, low production costs, and smooth scheduling. Furthermore, all six dimensions will be cumulative and averaged to represent culture. Figure. 7, the results of the profile of organizational culture trends in large-size construction companies in East Java have been shown.

Figure 7. The Results of Overall Cultural Trends in Construction Companies in East Java

Figures. 7 shows that the organizational culture profile of construction companies is inclined to be internal focus, integration, stability, and control. The highest trend results were in clan culture, with an average value of 27.51. Likewise, the second strongest cultural trend is the market, with an average value of 26.35. The two weakest cultures are hierarchy, with an average value of 24.87, followed by adhocracy culture, with an average value of 21.27. The overall dominance of clan can be seen from the fact that construction companies in East Java have an internal cultural focus, where the company is family in nature and a friendly place. Clan shows a culture of sharing and high commitment. The company understands the importance of participatory human resource development and is oriented towards teamwork and customer sensitivity (Cameron & Quinn, 2006).

Studies of organizational culture trends have also been investigated in several other regions in Indonesia and other countries. Coffey et al. (2011) examined organizational culture trends in Indonesia with a sample of five contractor companies in Jakarta and Manado. This research showed that two companies in Jakarta tend to have a hierarchy and market culture, while three companies in Manado tend to have a market, clan, and hierarchy culture. Nukić & Huemann (2011) researched contractor companies in Croatia, and Zhang & Liu, (2006) researched contractor companies in China, where the OCAI results showed that companies tended towards a hierarchy culture. In addition, (Rameezdeen, 2003) examined cultural trends in Sri Lanka, where contractor companies tended to market culture. Then, Ackon et al. (2022) also researched the trends of contractor companies in Ghana. The research results showed that companies tended to an adhocracy culture.

The results of this study have similarities with the culture of Turkey and the United States of America. Oney-Yazici et al. (2006) dan Oney-Yazic et al. (2007) found that contractor companies tend to dominate clan culture. From the comparison results that have been explained, it was found that there were cultural differences in each construction company. This phenomenon may occur due to differences in business environments, which include the geographically dispersed nature of culture, the dynamic nature of project management, workforce conditions, the number of organizations, and their perspectives on project duration (Riley & Clare-Brown, 2001).

CONCLUSION

This study investigates cultural practices and trends in large companies in East Java. The research results showed that the dimensions of cultural practices, which are employee participation, innovation culture, reward, punishment, and teamwork orientation still needed to be implemented optimally (level 3). Meanwhile, the performance emphasis dimension has been fully implemented (level 4). The trend of cultural domination of construction companies in East Java is clan culture. The levels of cultural trends of construction companies in East Java from strongest to weakest are clan, market, hierarchy, and adhocracy, with values of 27.51, 26.35, 24.87, and 21.27, respectively. The trend of cultural domination of contractor companies in East Java has similarities with Manado in Indonesia, Turkey, and the United States of America. However, the trend for cultural dominance is different even in the same country, namely in Jakarta and several other countries such as Sri Lanka, China, and Ghana. The limitation of this research is that the study's population only includes large-size qualified companies in East Java. Recommendations for further research include increasing the study population with the qualifications of small, medium, and large-size construction companies, as well as researching each qualification. Further research can also examine the trend of cultural dominance (clan, adhocracy, hierarchy, or market), which can significantly enhance company performance.

REFERENCES

Ackon, F., Kheni, N. A., & Mensah, J. V. (2022). Influence of Organisational Culture on Project Planning: a Competing Values Perspective in Ghanaian Context. *African Journal of Applied Research*, *8*(2), 344–355. https://doi.org/10.26437/ajar.31.10.2022.24

Adeleke, A. Q., & Aziz, S. A. A. (2021). Influence of Rewarding and Punishing on Project Success Among Kuantan Malaysian Construction Industries. *International Journal of Engineering Science Technologies*, *5*(3), 39–56. https://doi.org/10.29121/ijoest.v5.i3.2021.198

Cameron, K. S., & Quinn, R. E. (2006). *Diagnosing and Changing Organizational Culture: Based on the Competing Values Framework*. Jossey-Bass.

Cheung, S. O., Wong, P. S. P., & Lam, A. L. (2012). An investigation of the relationship between organizational culture and the performance of construction organizations. *Journal of Business Economics and Management*, *13*(4), 688–704. https://doi.org/10.3846/16111699.2011.620157

Choi, J. O., Gad, G. M., Shane, J. S., & Strong, K. C. (2015). Culture and Organizational Culture in the Construction Industry: a Literature Review. *5th International/11th Construction Specialty Conference*, *173*, 1–9.

Choi, S., Jang, H., & Hyun, J. (2009). Correlation between innovation and performance of construction firms. *Canadian Journal of Civil Engineering*, *36*(11), 1722–1731. https://doi.org/10.1139/L09-070

Coffey, V., Willar, D., & Trigunarsyah, B. (2011). Profiles of Organisational Culture in Indonesian Construction Companies. *Construction*.

Dobni, C. B. (2008). Measuring innovation culture in organizations: The development of a generalized innovation culture construct using exploratory factor analysis. *European Journal of Innovation Management*, *11*(4), 539–559. https://doi.org/10.1108/14601060810911156

Dulaimi, M., & Hartmann, A. (2006). The role of organizational culture in motivating innovative behaviour in construction firms. *Construction Innovation*, *6*(3), 159–172. https://doi.org/10.1108/14714170610710712

Faradisa, A. W., & Martiana, T. (2021). Correlation of Work Motivation, Reward, and Punishment with Compliance Behavior in Using Personal Protective Equipment. *Indonesian Journal of Occupational Safety and Health*, *10*(2), 208–217. https://doi.org/10.20473/ijosh.v10i2.2021.208-217

Ibrahim, C. K. I., Costello, S. B., & Wilkinson, S. (2011). Key relationship oriented indicators of team integration in construction projects. *International Journal of Innovation, Management and*

Technology, *2*(6), 441–446. http://www.ijimt.org/papers/173-A10025.pdf

Liu, A. M. M. (1999). Culture in the Hong Kong real-estate profession: A trait approach. *Habitat International*, *23*(3), 413–425. https://doi.org/10.1016/S0197-3975(99)00015-6

Luki Karunia, R. (2020). The influence of leadership, organisational structure, and organisational culture on the company performance of PT NK TBK. *International Journal of Innovation, Creativity and Change*, *11*(2), 164–178.

Mohammed, A. K., & Bin Ishak, M. S. (2024). Identification of project cultural factors affecting the performance of UAE construction projects. *Alexandria Engineering Journal*, *86*(November 2023), 205–216. https://doi.org/10.1016/j.aej.2023.11.064

Načinović, I., Galetić, L., & Čavlek, N. (2009). Corporate culture and innovation: implications for reward systems. *International Conference on Innovation, ...*, *3*(5), 32–38. http://bib.irb.hr/prikazi-rad?lang=en&rad=413029

Nani, G., & Apraku, K. (2016). Effects of Reward Systems on Performance of Construction Workers in Ghana. *Civil and Environmental Research*, *8*(7), 61-69–69.

Nguyen, L. H., & Watanabe, T. (2017). The impact of project organizational culture on the performance of construction projects. *Sustainability (Switzerland)*, *9*(5), 19–25. https://doi.org/10.3390/su9050781

Nifa, F. A. A., & Ahmed, V. (2010). The role of organizational culture in construction partnering to produce innovation. *Association of Researchers in Construction Management, ARCOM 2010 - Proceedings of the 26th Annual Conference*, September, 725–734.

Nukic, I. S., & Huemann, M. (2016). Organizational culture of the Croatian construction industry. *Engineering, Construction and Architectural Management*, *23*(2), 237–260. https://doi.org/10.1108/ECAM-02-2015-0019

Oney-Yazic, E., Arditi, D., & Uwakweh, B. O. (2006). Organizational Culture in US Construction Companies. *CCIM Sustainable Development through Culture and Innovation*, *1985*, 219–228.

Oney-Yazici, E., Giritli, H., Topcu-Oraz, G., & Acar, E. (2007). Organizational culture: The case of Turkish construction industry. *Engineering, Construction and Architectural Management*, *14*(6), 519–531. https://doi.org/10.1108/09699980710828996

Ozorhon, B., & Oral, K. (2017). Drivers of Innovation in Construction Projects. *Journal of Construction Engineering and Management*, *143*(4), 1–9. https://doi.org/10.1061/(asce)co.1943-7862.0001234

Rameezdeen, R. (2003). Organisational Culture in Construction: An Employee Prespective. *The Australian Journal of Construction Economics and Building*, *3*(1), 19–30. https://doi.org/10.1016/0022-3697(62)90006-9

Ren, Z., Atout, M., & Jones, J. (2008). Root causes of construction project delays in Dubai. *Association of Researchers in Construction Management, ARCOM 2008 - Proceedings of the 24th Annual Conference*, *2*(September), 749–757.

Riley, M., & Clare-Brown, D. (2001). Comparison of Cultures in Construction. *Journal of Management in Engineering*, *17*(July), 149–158.

Stefanovska–petkovska, M., Petrovska, I., Bojadziev, M., & Schaeffer, I. (2019). The effects of organizational culture and dimensions on job satisfaction and work-life balance. *Montenegrin Journal of Economics*, *15*(1), 99–112. https://doi.org/10.14254/1800-5845/2019.15-1.8

Sun, S. (2009). Organizational Culture and Its Themes. *International Journal of Business and Management*, *3*(12), 137–141. https://doi.org/10.5539/ijbm.v3n12p137

Tayeh, O. A., Hallaq, K. El, & Tayeh, B. A. (2018). Importance of organizational culture for Gaza strip construction companies. *International Journal of Engineering and Management Research*, *8*(1), 35–39.

Xue, X., Zhang, R., Yang, R., & Dai, J. (2014). Innovation in construction: A critical review and future research. *International Journal of Innovation Science*, *6*(2), 111–125. https://doi.org/10.1260/1757-2223.6.2.111

Yap, J. B. H., Leong, W. J., & Skitmore, M. (2020). Capitalising teamwork for enhancing project delivery and management in construction: empirical study in Malaysia. *Engineering, Construction and Architectural Management*, *27*(7), 1479–1503. https://doi.org/10.1108/ECAM-10-2019-0581

Zhang, S. B., & Liu, A. M. M. (2006). Organisational culture profiles of construction enterprises in China. *Construction Management and Economics*, *24*(8), 817–828. https://doi.org/10.1080/01446190600704604

Zou, P. X. W. (2006). Strategies for minimizing corruption in the construction industry in China. *Journal of Construction in Developing Countries*, *11*(2), 15–29.

Zuo, J., Zillante, G., & Coffey, V. (2008). Project Culture in the Chinese Construction Industry: Perceptions of Contractors. *The Australian Journal of Construction Economics and Building*, *9*(2), 1–11.