Strategy for Quality Culture Development of Construction Implementing Service Companies in Running A Quality Management System Based on Organizational Culture and National Culture to Reduce Construction Failure Rates

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Article history:	Abstract

Abstract

The purpose of this study is to provide an overview of the development of a quality culture in implementing a quality management system based on ISO 9001 based on organizational culture and national culture that influence each other in contracting companies, especially in Indonesia. The analysis of this research by processing 151 respondents' data using SPSS and SmartPLS. From the results of the analysis, it was found that the National Culture, Quality Management System, and Organizational Culture affect the Quality Culture Development. The significant indicators of the National Culture variable on the Quality Culture Development are individualism/collectivism and power distance. While the significant indicators of the Quality Management System variable on the Quality Culture Development are organizational and operational contexts. A significant indicator of the Organizational Culture variable on the development of a Quality Culture is Efforts to Achieve Performance and Leadership. To develop a Quality Culture influenced by the National Culture, Quality Management System, and Organizational Culture. This research can be used as material or input in developing a Quality Culture to reduce the rate of construction failure in BUMN construction service companies in Indonesia in the future.

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1 Introduction

Construction failure is a condition that results from construction work that is not following the agreement in the work contract, both in terms of quality and stated specifications (PP No. 29 of 2000 article 31 concerning the Implementation of Construction Services). The basic cause of construction failure itself is the relationship of the many causes that exist in it. Meanwhile, the purpose of building failure is the non-functioning of the building either partially or completely after the maintenance period is complete (Indonesia Government Regulation No. 29 of 2000 article 34 concerning the Implementation of Construction Services).

Based on journal references, the causes of nonconformities in construction results can be sourced from the Client, Design, Contractor Quality Management, and Human Resources (Aljassmi & Han, 2014; Azeez Ahamed & Asadi, 2017; Hasan et al., 2016; Heravi Torbati, Coffey, & Trigunarsyah, 2011; Yates & Lockley, 2002; Josephson & Hammarlund, 1999; Love et al., 2016; Love et al. 2004; Pheng & Wee, 2001; Waziri, 2016). Meanwhile, Josephson & Hammarlund's research provides data that the source of defect costs in construction is around 65% from contractors, of which about 45% are related to site management, workers, and subcontractors, and about 20% are related to materials or equipment (Josephson & Hammarlund, 1999). Meanwhile, in another study, it is stated that the main cause of defects is the result of individual actions that are influenced by workplace conditions, with an average value of 50% of the cost of construction defects due to individual motivation in doing their work. The causes are mostly due to forgetfulness and carelessness, then due to lack of knowledge, only a small part is intentional, and a small part is due to lack of communication, pressure, and risk factors (Josephson & Hammarlund, 1999). As well as the consequences of the failure of the human resource control system (Pheng & Wee, 2001).

According to the research results of Tam et al. (2000), which states that the biggest barrier to implementing quality management in construction companies is the company culture itself (quoted from Hoonakker et al., 2010). So having an ISO 9001 certificate does not mean that the company implements a Quality Management System well, to do so requires a new culture change that focuses on achieving greater customer satisfaction and improving all processes at all levels within the company (Willar, 2012). While more specifically, several studies state that to be able to run a quality management system well, construction companies must implement a quality culture (Henry, 2006), quoted from Cronemyr et al. (2017); Gryna et al. (2007); Dellana & Hauser (1999); quoted from Mahmood & Mohammed (2008).

It can be concluded that to be able to improve the quality performance of construction companies is to change the organizational culture to implement a quality culture. Cultural change will touch down to the individual level, because culture is an assumption that has been spread and has been accepted, which determines the daily behaviour of members of the group (Schein, 2014), or it can also be interpreted as behaviour that has been adopted by society (corporations, groups). , or team) as a mutually acceptable way to solve problems (Mahmood & Mohammed, 2008). Meanwhile, quality culture is defined by Gryna et al. (2007), as a pattern of habits, beliefs, and behaviours related to quality (quoted from Mahmood & Mohammed, 2008).

Changing an existing organizational culture is not an easy job (Sandholm (1999), quoted from Willar, Coffey, & Trigunarsyah, 2015). To be able to form a new culture, the existing internal culture must be reviewed first Maull et al. (2001), quoted from Willar et al., 2016). Organizational culture itself is influenced by national culture (Schein, 1992; Green, 1988; Hofestede, 1998; quoted from Nukić (2019), and key sub-cultures related to occupation or profession (Schein, 2014).

Literature review and hypothesis development

National Culture → Organizational Culture
Organizational culture itself is influenced by national culture (Schein, 1992; Green, 1988; Hofestede, 1998; quoted from Nukić, 2018). Adapted from Johnson & Scholes (1997), it is argued that there are variations of cultural influences on individuals and stakeholders that shape their expectations, which include national culture, vocational culture (industrial, institutional and professional culture) and organizational culture (Mahmood & Mohammed, 2008) Johnson et al. (2009), summarizes the factors that influence organizational culture is the national culture (Pratt & Beaulieu, 1992). So it can be concluded that National Culture affects Organizational Culture.
H1: Indonesian National Culture's effect on Organizational Culture

National Culture → Quality Management System

Previous research that has been done has proven that one of the cultures that influence corporate organizations is national culture (Ansah & Louw, 2019; Johnson et al., 2009; Nukić, 2019). In his research on the implementation of Total Quality Management (TQM) in 14 multinational manufacturing companies in Iran, Mardani & Kazemilari found that several dimensions of Hofstede's national culture were proven to be correlated with the dimensions of TQM implementation (Mardani & Kazemilari, 2012). So it can be concluded that national cultural factors affect the quality management system.

H2: Indonesian National Culture effect on Quality Management System

National Culture → Quality Culture Development

Several previous studies, according to Saha & Hardie (2005), quality culture can be described as a culture that prioritizes leadership over supervision, inspires staff commitment to selected quality activities, uses teams as the main management style, allows staff at all levels to participates in work-related decisions, increases pride in work results, dispels fear, and inspires people to seek continuous improvement. Quality culture is for each employee. As previously explained, national culture also works on individuals and is at the level of fundamental values. So the fundamental values of national culture in individuals will influence their actions in implementing a quality culture.

H3, H4, H5: Indonesian National Culture effect on Quality Culture Development

Organizational Culture → Quality Management System

In several previous studies on the application of TQM, McNabb & Sepic (1995), stated that most of the failures in implementing TQM in a company were not due to management errors, but due to more critical, deep, and fundamental causes, namely related to the culture that has been running and embedded in the organization. all employees thus affecting the company's operational climate (quoted from, Sousa-Poza, Nystrom, & Wiebe, 2001). Therefore, for the implementation of a quality management system to work well, the company must first study its organizational culture in depth (Sousa-Poza et al., 2001; Willar et al., 2016). So it can be concluded that organizational culture will affect the implementation of the quality management system.

H6: Organizational Culture effect on Quality Management System

Organizational Culture → Quality Culture Development

According to Ingelsson (2013), in building a strong quality culture, organizational culture needs to be taken into account, and leadership is found to be an important factor. The first step in implementing the initiation of QM is an assessment of the existing culture. So it can be concluded that organizational culture will affect the existing culture of a company.

H7, H8, H9: Organizational Culture effect on Quality Culture Development

Quality Management System → Quality Culture Development

The implementation of the quality management system in construction companies is experiencing obstacles due to resistance from internal organizations. The reason is that it is considered not to follow the company's culture so it is felt to be burdensome and burdensome. Therefore, the quality management system implementation process must also be customized and synergized with the company culture, and it may take time to create the expected quality culture because the implementation of a quality management system is a dynamic process (Wu et al., 2011).

H10, H11, H12: Quality Management System influences the Quality Culture Development

2   Materials and Methods

In this study, variable Y (the dependent variable) is the construction failure rate. Meanwhile, variable X (independent variable), consists of National Culture, Quality Management System, Organizational Culture, and Quality Culture Development. The research instrument used in this research is a survey and archive analysis. The survey was conducted to collect data utilizing interviews with experts and filling out questionnaires to respondents. Meanwhile, archive analysis was conducted to determine the factors that affect the accuracy of conceptual cost estimates. The archival analysis is also used to support the discussion of each research question (RQ).

National cultural variable instruments

The instrument for the National Culture variable uses a questionnaire that has been widely used in previous research on national culture in companies, namely the Values Survey Module (VSM) developed by Hofstede based on decades of studies. VSM was chosen because the cultural dimension of this instrument has been widely used in previous studies related to national culture (Boscariet al., 2018; Choi et al., 2015; López-Duarte et al., 2016). In addition, the dimensions in the VSM are also generated based on empirical research using modern statistical analysis methods, not from mere thought (Hofstede, 2011). According to Vijesh Jain, in his dissertation (Jain, 2013), the reason why VSM is the most preferred by researchers and trainers is first that the model provides good tools and is easy to use. The second reason, apart from that this model has been tested many times, is because VSM is formulated based on research conducted in the workplace so that its dimensions approach is closer to the world of work.

This VSM module contains 24 questions related to the influence of cultural values, plus 6 questions related to the demographics of the respondents. The results of the questionnaire will describe the preferences of respondents to the six dimensions of national culture that have been formulated previously. The Values Survey Module (VSM) was last updated in 2013. The following is the entry for the 2013 VSM.

Quality Management System (QMS) Variable Instruments

The Quality Management System (QMS) variable instrument adopts the internal audit standard ISO 9001:2015, which has been summarized by BSI (bsi.com) into a Self-Assessment Checklist. The questionnaire question indicators were then processed by researchers to get perceptions from respondents in the form of a Likert scale.

Organizational Culture Variable Instrument

The instrument for the organizational culture variable using the OCAI questionnaire was developed by Cameron & Quinn and has often been used in previous research on organizational culture conducted by other researchers. Gambi et al from the results of their literature study, stated that OCAI based on the Competing Values Framework (CVF) is not only well-established (Naor et al., 2008) and is also a theoretically sound instrument (Zu et al., 2010), but has also been widely used in studies on quality management (Gambi et al., 2015). In addition, based on the results of literature studies conducted, from some scientific studies published after 2000 to 2020, with related titles or containing the words Organization Culture and Construction, most (eleven out of twenty studies) used the OCAI instrument, while several other studies outside the construction sector (Zhao et al., 2009).

Quality Culture Variable Instrument

The following is the form of the quality culture variable instrument which has been adopted from some of the literature that has been summarized by the author into a questionnaire.
Data Analysis

Analysis Method for RQ1, RQ2, RQ3, RQ 4

Phase I data analysis is data analysis to process data from initial expert validation, using the Delphi method. According to Korombel & Tworek (2011), the Delphi method is a method that relies on the knowledge and experience of experts relevant to research. At this stage, the variables will be clarified and assessed as accurate, based on the approval of at least 2 of 3 experts experts (Wardahni et al., 2020). The output of data analysis at this stage is content validation and construct validation of variable indicators.

Phase II data analysis is data analysis to process data from the results of the pilot survey using descriptive analysis. Data analysis was conducted to determine whether the questionnaire was easy to understand or not. If there are 5 out of 7 respondents feel that the questionnaire is difficult to understand, improvements will be made to the construct and content of the questionnaire (Wardahni et al., 2020). The output of data analysis at this stage is a variable indicator that is easily understood by respondents.

Phase III data analysis is an analysis of indicators, variables and relationship models by testing homogeneity, validity, reliability, data adequacy and tabulating the Model Evaluation questionnaire with Structural Equation Modeling (SEM). In this study, the SEM modelling structure uses all variables, both dependent and independent, which have been described synthesis of Relationships between Variables. The experts from the first phase of the questionnaire are experts in state-owned construction service companies who have at least 10 years of experience.

To answer RQ 4, the results of RQ1, RQ2, and RQ3 were collected. Furthermore, data analysis was carried out using benchmarking analysis which was validated based on the literature and opinions from experts. Then it is formulated in the form of a proposed strategy which is then discussed with the Delphi method to get feedback from experts, academics, and wider practitioners (Yoon, 2009).

3 Results and Discussions

Dimensions/Variables of National Culture in Quality Culture Development (RQ1)

After conducting a literature study, it was found that there are 4 main dimensions by Hoftstede (1980), namely power distance, uncertainty avoidance, individualism/collectivism, and masculinity/femininity, while further research resulted in the addition of two other dimensions by Agodzo (2014). Of the six dimensions, then validated by experts who have at least 10 years of experience in the field of construction implementers, it was found that there are only 5 dimensions of national culture that affect the development of a quality culture. The following are the dimensions/variables of National Culture in Quality Culture Development that have been identified.

Table 1
Result of national culture dimensions/variables effect on quality culture development

No	National Culture Dimensions/Variables Effect on Quality Culture Development
1	Organizational Context Indicator Understanding of the organization and its context, both external and internal, from interested parties to improve the quality management system including its processes. Understanding the external context can be facilitated by considering issues arising from the legal, technological, competitive, market, cultural, social, and economic environment, be it international, national, regional or local. Understanding the internal context can be facilitated by considering issues related to organizational values, culture, knowledge and performance
2	Leadership Indicator Top management must demonstrate leadership and commitment to QMS and customer focus and establish, implement and communicate a quality policy. Management is also clear in determining the organization's roles, responsibilities and authorities.
3	Planning Indicator The organization determines, plans and evaluates risk and opportunity actions based on the problems that have been considered to improve the QMS including if necessary changes, then carried out in a planned manner.
4	Supporting Indicator The organization determines, provides and monitors, inter alia, resources, worker competencies, communications relevant to the QMS and documented information required by International Standards for the effectiveness of the QMS in achieving product or service conformity.
5	Operational Indicator The organization plans, implements and controls operational processes covering product and service requirements, product and service design and development, control of externally provided products and services, production and service provision and control of nonconforming outputs to improve QMS
6	Performance Evaluation Indicator The organization monitors, measures, analyzes and evaluates the effectiveness of the QMS as well as internal audits and reviews the organization's QMS to ensure its continuing suitability, adequacy, effectiveness and alignment with the strategic direction of the organization
7	Improvement Indicator The organization determines and selects opportunities for improvement and implements necessary actions and retains documented information as evidence to improve the adaptability, adequacy and effectiveness of the QMS

Dimensions/variables of quality management system in quality culture development (RQ2)

After a literature study was conducted, it was found that there is an internal audit standard ISO 9001: 2015 which has 7 indicators which were then validated by experts who have at least 10 years of experience in the field of construction implementers, it was found that only all variables affect the development of a quality culture (Zheng et al., 2010). The following are the dimensions/variables of the quality management system in the development of a quality culture that have been identified.

Table 2
Results of variables/indicators of quality management system affect quality culture development

No	Variables/Indicators of Quality Management System Effect Quality Culture Development
1	Organizational Context Indicator Understanding of the organization and its context, both external and internal, from interested parties to improve the quality management system including its processes. Understanding the external context can be facilitated by considering issues arising from the legal, technological, competitive, market, cultural, social, and economic environment, be it international, national, regional or local. Understanding the internal context can be facilitated by considering issues related to organizational values, culture, knowledge and performance
2	Leadership Indicator Top management must demonstrate leadership and commitment to QMS and customer focus and establish, implement and communicate a quality policy. Management is also clear in determining the organization's roles, responsibilities and authorities.
3	Planning Indicator The organization determines, plans and evaluates risk and opportunity actions based on the problems that have been considered to improve the QMS including if necessary changes, then carried out in a planned manner.
4	Supporting Indicator The organization determines, provides and monitors, inter alia, resources, worker competencies, communications relevant to the QMS and documented information required by International Standards for the effectiveness of the QMS in achieving product or service conformity.
5	Operational Indicator The organization plans, implements and controls operational processes covering product and service requirements, product and service design and development, control of externally provided products and services, production and service provision and control of nonconforming outputs to improve QMS
6	Performance Evaluation Indicator The organization monitors, measures, analyzes and evaluates the effectiveness of the QMS as well as internal audits and reviews the organization's QMS to ensure its continuing suitability, adequacy, effectiveness and alignment with the strategic direction of the organization
7	Improvement Indicator The organization determines and selects opportunities for improvement and implements necessary actions and retains documented information as evidence to improve the adaptability, adequacy and effectiveness of the QMS

Dimensions/variables of organizational culture in quality culture development (RQ3)

After conducting a literature study, it was found that there is an OCAI (Organizational Culture Assessment Instrument) instrument that is used by many researchers. In addition, several indicators were added based on the grouping of organizational culture factors. In this study, there are two indicators, part a is an instrument of OCAI (Organizational Culture Assessment) and part b is a grouping of several kinds of literature that have been collected by researchers. All indicators were then validated by experts who have at least 10 years of experience in the field of construction implementers, it was found that only all variables affect the development of a quality culture. The following are the dimensions/variables of organizational culture in the development of a quality culture that have been identified (Kull & Wacker, 2010).

Table 3
Result of organizational culture dimensions/variables effect quality culture development

No	Result of Organizational Culture Dimensions/Variables Effect Quality Culture Development
Section A	
1	Dominant Characteristics It shows what characteristics are easily visible and most prominent in the organizational environment.
2	Organizational Leadership This shows what the leadership style in the organization looks like, the leadership model, and subordinates' perception of the existing leadership model
3	Employee Management It shows how to manage employees in an organization, both group and individual management
4	Organizational Adhesive It shows what values are used in attaching all existing resources in an organization
5	Strategy Emphasis It shows how the organization can focus all the elements on achieving its existing strategic mission
6	Success Criteria This shows how companies set standards for achieving existing goals
Section B	
A	Achievement of objectives How the company manages company goals and socializes them so that these goals can be achieved.
B	Teamwork How the company seeks teamwork to achieve optimal results.
C	Empowerment How the company empowers its employees to reach their maximum potential.
D	Recognition and Awards How companies identify employee achievements and reward them
E	Performance Achievement Effort How the company and its employees successfully perform and achieve their goals.
F	Leadership How leaders support the achievement of company goals.
G	Reaction to Change How employees react to the company's improvement program.

Significant indicators on quality culture development strategy (RQ4)

Based on the results of primary data analysis to answer Research Question 4 (RQ4) with the help of the SmartPLS program described in the previous chapter, it was found that the development of a quality culture was significantly influenced by several indicators. These indicators are identified based on the results of bootstrapping as follows.

Table 4
Outer loadings of variables quality culture dimensions

Construct	Original Sample (O)	T Statistics (|O/STDEV|)	P Values
X1.A2 -> X1	**0.740**	**7.505**	**0.000**
X1.C1 -> X1	**0.823**	**8.905**	**0.000**
X2.A1 -> X2	0.801	18.144	0.000
X2.A3 -> X2	**0.833**	**19.231**	**0.000**
X2.A4 -> X2	0.713	11.017	0.000
X2.E10 -> X2	**0.843**	**21.741**	**0.000**
X2.E2 -> X2	0.765	12.556	0.000
X2.F1 -> X2	0.726	11.138	0.000
X3.b.A6 -> X3	0.790	17.737	0.000

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Construct	Original Sample (O)	T Statistics (|O/STDEV|)	P Values
X3.b.A8 -> X3	0.715	15.056	0.000
X3.b.E11 -> X3	0.735	10.013	0.000
X3.b.E5 -> X3	**0.823**	**19.486**	**0.000**
X3.b.E6 -> X3	0.710	15.520	0.000
X3.b.F1 -> X3	0.773	15.386	0.000
X3.b.F2 -> X3	**0.857**	**23.716**	**0.000**
X3.b.G3 -> X3	0.766	13.192	0.000
Y.I.A <- Y1	0.876	38.582	0.000
Y.I.B <- Y1	0.877	40.162	0.000
Y.I.C <- Y1	0.933	79.649	0.000
Y.I.D <- Y1	0.887	40.329	0.000
Y.I.E <- Y1	0.930	70.261	0.000
Y.I.F <- Y1	0.922	63.254	0.000
Y.I.G <- Y1	0.913	57.876	0.000
Y.I.H <- Y1	0.834	18.239	0.000
Y.II.A <- Y2	0.893	46.475	0.000
Y.II.B <- Y2	0.855	32.956	0.000
Y.II.C <- Y2	0.877	42.242	0.000
Y.II.D <- Y2	0.829	30.555	0.000
Y.II.E <- Y2	0.861	36.701	0.000
Y.II.F <- Y2	0.704	8.578	0.000
Y.II.G <- Y2	0.885	46.694	0.000
Y.II.H <- Y2	0.827	20.722	0.000
Y.II.I <- Y2	0.827	23.550	0.000
Y.II.J <- Y2	0.795	16.942	0.000
Y.II.K <- Y2	0.860	33.444	0.000
Y.II.L <- Y2	0.790	22.831	0.000
Y.II.M <- Y2	0.766	12.935	0.000
Y.II.N <- Y2	0.807	28.278	0.000
Y.II.O <- Y2	0.797	24.104	0.000
Y.III.A3 -> Y3	0.802	24.040	0.000
Y.III.A4 -> Y3	0.820	24.978	0.000
Y.III.A5 -> Y3	0.844	28.936	0.000
Y.III.B1 -> Y3	0.871	35.398	0.000
Y.III.B13 -> Y3	0.790	22.971	0.000
Y.III.B6 -> Y3	0.914	50.599	0.000
Y.III.B8 -> Y3	0.829	26.327	0.000
Y.III.C3 -> Y3	0.853	27.366	0.000
Y.III.C5 -> Y3	0.804	15.689	0.000
Y.III.D3 -> Y3	0.816	16.048	0.000
Y.III.D4 -> Y3	0.744	15.566	0.000
Y.III.D6 -> Y3	0.821	15.806	0.000
Y.III.D7 -> Y3	0.787	19.003	0.000
Y.III.D8 -> Y3	0.840	33.765	0.000

Discussion
Dominant Effect

The following summarizes the results of the outer loadings represented by 2 dominant indicators of the variables that affect the dimensions of the formation of a quality culture.

Table 5
Significant indicators on quality culture

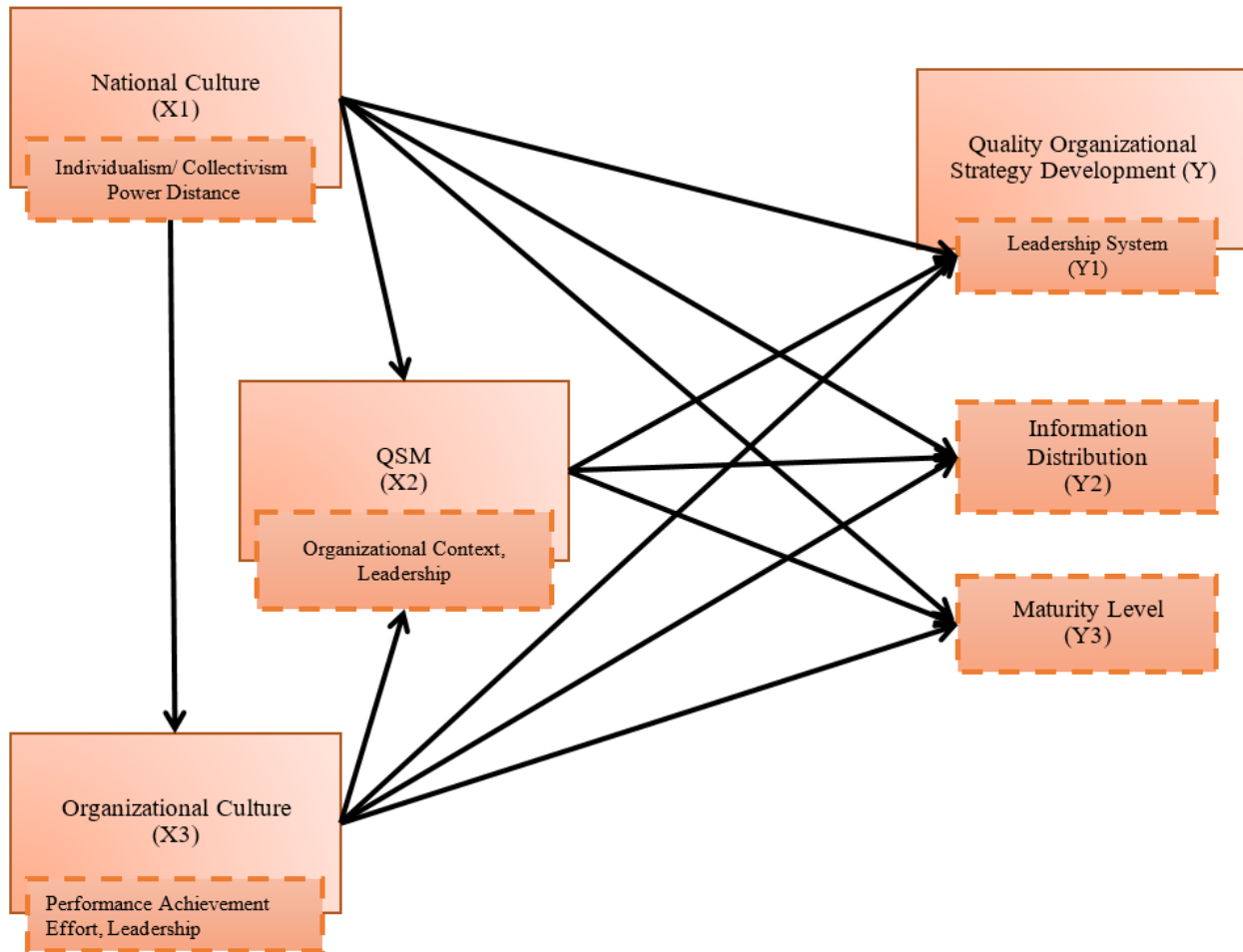| Construct	Code	Indicators	Definition
X1.A2 -> X1	A2	Individualism/ Collectivism	Individualism is a psychological state in which people see themselves first as individuals and believe that their interests as individuals come first. While collectivism is a psychological state in which the values and goals of a group, such as a large family, ethnic group, or company, are paramount (Hofstede, 1993).
X1.C1 -> X1	C1	Power Distance	Power distance is the extent to which members with lower positions in a community, such as an organization or in a country, expect and accept that power is distributed unequally to those in positions above it. For example, between subordinates and superiors or students and teachers (Hofstede, 1980; Hofstede & Hofstede, 2005).
X2.A3 -> X2	A3	Organizational Context	Understanding of the organization and its context, both external and internal, from interested parties to improve the quality management system including its processes. Understanding the external context can be facilitated by considering issues arising from the legal, technological, competitive, market, cultural, social, and economic environment, be it international, national, regional or local. Understanding the internal context can be facilitated by considering issues related to organizational values, culture, knowledge and performance
X2.E10 -> X2	E10	Operational	The organization plans, implements and controls operational processes covering product and service requirements, product and service design and development, control of externally provided products and services, production and service provision and control of nonconforming outputs to improve QMS
X3.b.E5 -> X3	E5	Performance Achievement Effort	How the company and its employees successfully perform and achieve their goals.
X3.b.F2 -> X3	F2	Leadership	How leaders support the achievement of company goals.

Figure 1. Significant indicators on quality culture

Based on the picture above, it can be seen that there are 3 (three) factors that influence the formation of quality culture, two dimensions of a quality culture that have a significant direct effect are shown by the thick black arrow, namely Information Distribution, while the red arrow is an indirect significant effect, namely Maturity Level, which is influenced by the Quality Management System, which is also influenced by the variables of National Culture and Organizational Culture. Meanwhile, the distribution of information and the level of maturity is directly affected by the significant leadership system. So the Leadership System, Information Distribution, and Maturity Level are the keys to success in developing a quality culture.

t-test

The effect of the relationship between variables is obtained through T-Statistic results from bootstrapping results in SmartPLS software. From the value of T-Statistics (O/STDEV) it can be seen that the relationship between variables is significant, namely those that have a T-Statistics value above 1.96.

Table 6
T-test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Information	
X1 -> X2	0.163	0.153	0.068	2.388	0.017	Significant	Direct Effect
X1 -> X3	0.457	0.466	0.073	6.290	0.000	Significant	Direct Effect
X1 -> Y1	0.415	0.427	0.071	5.810	0.000	Significant	**Indirect Effect**
X1 -> Y2	0.299	0.313	0.072	4.142	0.000	Significant	**Indirect Effect**
X1 -> Y3	0.395	0.397	0.076	5.210	0.000	Significant	**Indirect Effect**
X2 -> Y2	0.489	0.492	0.141	3.477	0.001	Significant	Direct Effect
X2 -> Y3	0.461	0.470	0.142	3.247	0.001	Significant	**Indirect Effect**
X3 -> X2	0.712	0.719	0.056	12.801	0.000	Significant	Direct Effect
X3 -> Y1	0.921	0.914	0.070	13.229	0.000	Significant	Direct Effect
X3 -> Y2	0.684	0.649	0.196	3.496	0.001	Significant	**Indirect Effect**
X3 -> Y3	0.466	0.478	0.094	4.955	0.000	Significant	**Indirect Effect**
Y1 -> Y2	0.368	0.323	0.173	2.132	0.033	Significant	Direct Effect
Y2 -> Y3	0.950	0.960	0.029	33.314	0.000	Significant	Direct Effect

From the table summarizing the results of the T-Statistics above, the following conclusions can be drawn.

1) Indicator X1 (With dominant indicators represented by 2 dominant statements X1.A2 and X1.C1 which each have a T statistic value of 7.505 and 8.905) effect X2 (Quality Management System), X3 (Organizational Culture), Y1 (System Leadership), Y2 (Information Distribution), and Y3 (Maturity Level), not influenced by any indicator

2) Indicator X2 (With dominant indicators represented by 2 dominant statements X3.b.E5 and X3.b.F2, each of which has a T statistic value of 19,486 and 23,716) influenced by X1 (National Culture) and X3 (Organizational Culture), and affect Y2 (Distribution of Information) and Y3 (Maturity Level)

3) Indicator X3 (With dominant indicators represented by 2 dominant statements X2.A3 and X2.E10, each of which has a T statistic value of 21.741 and 19.486) influenced by X1 (National Culture)

4) Indicator Y1 (Leadership System) affects Y2 (Information Distribution)

5) Indicator Y2 (Distribution of Information) affects Y3 (Maturity Level)

Strategy to build Quality Culture based on Organizational Culture and National Culture in the implementation of Quality Management System in construction service companies in Indonesia (RQ4)

From the results of the bootstrapping output, it can be concluded several points to help formulate a strategy for developing a quality culture as follows.

1) That the X1 indicator (Individualism/Collectivism and Longterm/shortterm orientation) is the indicator that has the most significant influence on other indicators that will affect the Development of Quality Culture. Therefore, it is recommended that the X1 indicator be handled first so that it can have a positive influence on other indicators that have a significant direct or indirect effect on the Development of Quality Culture. With dominant indicators represented by 2 dominant statements X1.A2 and X1.C1, each of which has a T statistic of 7.505 and 8.905.

2) Indicator X3 (Efforts to Achieve Performance and Leadership) is an indicator that is influenced by indicator X1 and has a significant direct and indirect effect on X3, Y1, Y2 and Y3. Therefore, the X3 indicator is recommended to be the next priority for handling. With dominant indicators represented by 2 dominant statements X2.A3 and X2.E10, each of which has a T statistic of 21.741 and 19.486.

3) Indicator X2 (Organizational and Operational Context) is an indicator that is influenced by indicators X1 and X3, and has a significant direct and indirect effect on the Dimensions of Information Distribution and Maturity Level. Therefore, the X2 indicator is recommended to be the next priority to be handled in order to improve Quality Culture Development. With dominant indicators represented by 2 dominant statements X3.b.E5 and X3.b.F2, each of which has a T statistic of 19,486 and 23,716.

To obtain a more in-depth strategy for developing a quality culture, stage 4 data collection was carried out. The initial stage was a literature study to identify proposed strategies that could be applied. Furthermore, the proposals obtained from the results of the literature study were then validated to experts through the Final Validation questionnaire instrument and also interviews.

The results of the significance of the indicators obtained, coupled with the results of the final validation questionnaire from the expert, then formed a strategy model for developing a quality culture. The proposal is in the form of a relationship between strategy and efforts that need to be made based on the respective indicators and variables along with the actors of the strategy. Based on the SEM simulation that has been discussed in the previous subchapter, three indicators, namely X1, X2, and X3 have a significant direct and indirect influence on Y (Development of Quality Culture).

Table 7
Final validation data table

	Variable	Indicators		Statement	Suggestions and Efforts for Quality Culture development strategy	PIC
X1	National Cultural Variables	Individualism / Collectivism	X1.A2	Have job security	The company holds a training program in terms of K3 (Occupational Health and Safety) for employees	HR and Company Leaders
		Power Distance	X1.C1	Having a direct supervisor who can be respected	The elected leader is competent and recognized by his subordinates	HR and Company Leaders
X2	Quality Management System Variables	Organizational Context	X2.A3	The organization defines the boundaries and application of the QMS to define its scope.	Every employee must understand and understand the Quality Management System in determining the scope of his work	HR and Company Leaders
		Operational	X2.E10	The provision of products and services is carried out under controlled conditions which include: the availability of documented information that defines the activities to be carried out and the results to be achieved.	The company provides a means of updated information that is clear and documented to achieve the desired results	HR and Company Leaders
X3	Organizational Culture Variables	Performance Achievement Effort	X3.b.E5	The company is always committed to the project schedule.	The company provides rewards if the project is completed on schedule	The head of the company
		Leadership	X3.b.F2	Project managers assist, support, and	Active project managers improve	Manager and staff

Variable	Indicators	Statement	Suggestions and Efforts for Quality Culture development strategy	PIC
		communicate clearly with their subordinates to ensure the achievement of project objectives.	interpersonal skills, especially communication with subordinates to achieve project goals	

Based on the table above, it can be seen that to develop a quality culture, it is necessary to improve the National Culture, Quality Management System and Organizational Culture. This is in line with some previous studies. The leadership style of a project manager is one of the factors that affect the performance of human resources (Ainanur, 2013). This leadership style will form a quality culture in the leadership system of a company. The leadership system owned by a company or project is carried out by all workers working in the company/project, thus all activities are interrelated with each other so that it can affect the failure rate of a project's construction (Kaynak, 2003). This leadership system depends on the leadership abilities of a project manager which will influence the project team in achieving project targets by integrating a team (Wiriawan, 2015).

To obtain a good leadership system, it is necessary to support a good organizational culture as well. At the organizational level, culture is a set of assumptions, beliefs, values and perceptions held by members of the group concerned (Schein, 1992). Therefore, Organizational Culture will affect the behavior of individuals and groups within the organization. So that organizational culture can contribute to the leadership system in an organization. Several research results conclude that organizational culture has a significant effect on the leadership system (Ogbonna & Harris, 2000; Fallis, 2016).

The higher the quality culture and construction quality management system within the company, the more mature the quality documentation/communication flow process owned by the foreign private construction service company will be. This is because the existing target results must be translated into the quality management system process into a quality culture and quality activities within the company. Without a quality culture and quality activities that support the quality process, the target results will not be achieved and clearly measurable in quality documentation and communication (Suarbawa, 2022).

4 Conclusion

In this study, there are 4 (four) problem formulations that must be answered by each stage of the research that has been carried out. The answers to each of these problem formulations have been discussed in the findings and discussion chapter. Based on the purpose of this research, there are four things that the writer can conclude, namely:

a) There are 5 indicators of the National Culture variable in the development of a Quality Culture in construction service companies. SOEs in Indonesia

b) There are 7 indicators of the Quality Management System variable in the development of Quality Culture in BUMN construction service companies in Indonesia

c) There are 13 indicators of the related organizational culture variables in building a quality culture in state-owned construction service companies in Indonesia.

d) There is a strategy to build a Quality Culture based on Organizational Culture and National Culture in the implementation of the Quality Management System in BUMN construction service companies in Indonesia:
1) The company holds a training program in terms of K3 (Occupational Health and Safety) for employees
2) The elected leader is competent and recognized by his subordinates
3) Every employee must understand and understand the Quality Management System in determining the scope of his work
4) The company provides a means of updated information that is clear and documented to achieve the desired results
5) The company provides rewards if the project is completed on schedule

6) Active project managers improve interpersonal skills, especially communication with subordinates to achieve project goals

Suggestion

Based on the research that has been done, there are several suggestions and inputs that can be made in further research, namely as follows:

1) There is a need for further research that includes a larger limit, such as not only in state-owned companies. But includes all construction service companies in Indonesia or larger.
2) There is a need for research that discusses specifically about quality culture specifically outside the variables that have been examined, namely the leadership system, communication and documentation flow, and maturity level.

Conflict of interest statement
The authors declared that they have no competing interest.

Statement of authorship
The authors have a responsibility for the conception and design of the study. The authors have approved the final article.

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