



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



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Article history:

Submitted: 27 May 2022

Revised: 18 June 2022

Accepted: 09 July 2022

Keywords:

construction failure;

national culture;

professional culture;

quality culture;

strategy quality;

Abstract

The purpose of this study is to provide an overview of quality culture related to professional culture and national culture that influence each other in contracting companies, especially in Indonesia. The factors that will determine the development process are identified using Structural Equation Modeling. From the results of the analysis, it is found that professional culture, national culture and quality management systems can increase efforts to develop a quality culture in BUMN companies. The variable of professional culture with time and team indicators, variables of national culture with indicators of individualism/collectivism and power distance, and the variable quality management system with indicators of organizational and operational context has a significant effect on the Quality Culture Development. To be able to increase efforts to develop a quality culture in state-owned construction service companies, it is necessary to improve the professional culture, national culture, and quality management system effectively. This research can be used as material or input to improve efforts to develop a quality culture in BUMN construction companies in Indonesia in the future.

International research journal of engineering, IT & scientific research © 2021.

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1 Introduction

The low awareness of quality culture or quality is one of the main causes of failure or slow implementation of a quality management system in the construction world. At this time every construction service actor, including contractors in it, views an integrated quality management system as a must for the successful implementation of construction projects and can meet customer satisfaction (Krumbholz & Maiden, 2001; Arditi & Gunaydin, 1997). This is driven by the implementation of a free market system, where this system will invite foreign contractors to compete in the construction industry in Indonesia. On the other hand, a good quality management system can be a marketing propaganda for contractors to be able to compete in the construction industry outside Indonesia. Contractors who have an effective quality management system and can meet customer satisfaction who will be able to compete and survive in the midst of very tight market competition. To anticipate this, it is not surprising that many construction companies today (especially large ones) are competing to get ISO 9001 certification, which is an international standard for quality management.

Most of the causes of failure of construction results can be sourced from the fault of the Owner, Design, Quality Management of the Contractor itself, and Human Resources (Aljassmi & Han, 2014; Hasan et al., 2016; Heravi Torbati et al., 2011; Yates & Lockley, 2002; Josephson & Hammarlund, 1999; Love et al., 2004; Pheng & Wee, 2001; Waziri, 2016). Based on Josephson & Hammarlund's research by presenting data that the source of defect costs in construction is around 65% of which comes from contractors, of which 45% is related to site management, workers, and subcontractors, and 20% is related to materials or equipment (Josephson & Hammerlund, 1999). Then, on average, 50% of the cost of the nonconformity is attributable to the individual. So the cause of the construction quality discrepancy is mostly due to the implementation of quality management by the Contractor and mainly due to the individual actions of the implementers. This means that the action that must be taken to overcome this problem must be by touching down to the individual level within the company by promoting a sustainable quality culture.

According to Ashford (1989), sees that only a small part of construction quality failures are caused by technical factors. Management and organizational factors, such as poor communication flow (Cornick, 1991), are more often cited as root causes. McGeorge & Palmer (1997), explain that the problem that the construction industry has is a poor quality culture. There is no denying that in terms of quality, the construction industry has made major improvements. However, these improvements appear to be limited to certain aspects of the construction process. For example, the grounds may have been better laid out and the buildings better designed than they were ten years ago, but the end result is still not very satisfactory. This is, according to McGeorge & Palmer (1997), because this industry has not been fully customer focused. The industry further does not see quality as an issue that is entirely geared towards satisfying customer needs, but as a set of procedures related to design, materials or work safety in the field.

Therefore, efforts to improve quality by relying solely on the technical side (which is generally used by construction actors) or simply to obtain the certification as mentioned above are not enough. McGeorge & Palmer (1997), even assert that certification may not be the best route for establishing a total quality culture and quality improvement. This effort will be more successful if it is balanced with a human approach, such as by involving commitment from all levels of management, especially commitment from the top management of a company, and providing training and incentives that support quality improvement, in accordance with the philosophy of integrated quality management (TQM – Total Quality Management). In fact, many have stated that a quality culture is the most important element for the success of a TQM program (Dellana & Hauser, 1999). And this is the task of the company's leadership (top management) to bring about a change in the quality culture within the company.

So the solution to be able to improve the quality performance of construction companies is to look at the influence of professional culture in implementing a quality culture. Professional culture is basically related to the fact that employees who enter the organization carry a common set of values and beliefs based on their work, education, training, and past work experiences (Sheer & Chen, 2003). Cultural change can touch down to the individual level, because culture is an assumption that has spread and has been accepted by individuals, which determines the daily behavior of each member/individual of the group (Schein, 2014), or it can also be said as behavior that has been adopted by the community. (corporations, groups, or teams) become a mutually accepted way to solve problems (Mahmood & Mohammed, 2008). Meanwhile, quality culture according to Gryna et al., (2007), is a pattern of habits, beliefs, and behaviors related to quality (Mahmood & Mohammed, 2008). So in the cultural approach, individuals not only bring their national culture, but also their professional culture with them into the organizational context (Hofstede, 1991).

Literature review and hypothesis development

National Culture → Professional Culture

According to Hofstede (2011), national culture is the first to enter into an individual through socialization within the family. Professional culture will enter when the individual is studying. National culture is more towards values, while professional culture is a blend of values and practice. So that national culture is the basis of professional culture.

H1: Indonesian National Culture effect on Professional Culture

National Culture → Quality Management System

Several studies that have been conducted have proven that one of the cultures that influence corporate organizations is national culture (Owusu Ansah & Louw, 2019; Johnson et al., 2009). One of them 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 et al., 2012). So it is concluded that national cultural factors affect the quality management system.

H2: Indonesian National Culture effect on Quality Management System.

National Culture → Quality Culture Development

According to Saha & Hardie (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 participate in decision-making. work-related decisions, increase pride in work results, eliminate fear, and inspire people to seek continuous improvement. Quality culture is for each individual 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

Professional Culture → Quality Management System

In implementing a quality management system in a construction service company, it is possible that failures often occur due to rejection from certain groups. Construction service companies have complaints caused by people involved in their implementation, such as lack of employee commitment and lack of awareness. As well as complaints about the increasing administrative burden. This is closely related to the perceptions and values held by each individual. Rejection or acceptance from individuals or employees will certainly differ from one profession to another. So it can be said that the professional culture of employees will affect the implementation of the quality management system (Santya et al., 2022; Tripathy, 2018).

H6: Professional Culture effect on Quality Management System.

Professional Culture → Quality Culture Development

Quoted by Johnson et al. (2009), according to Dellana & Hauser (1999), professional culture is believed to have a greater influence on work styles and perspectives than organizational procedures and policies. Professional culture has proven to be a blend of value acquisition and practice. At this level, cultural differences are largely related to the place of socialization or learning (i.e, through school, training, or education) of the occupational group. In adopting this approach, individuals, therefore, bring not only their national culture but their professional culture with them into the organizational context (Hofstede, 1991). So that the professional culture possessed by employees will affect themselves in accepting new cultural values and being able to practice them.

H7, H8, H9: Professional Culture affects the 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 because it is considered not in accordance with the company's culture so that 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, the variable Y (the dependent variable) is the construction failure rate. Meanwhile, for variable X (independent variable), consists of National Culture, Quality Management System, Professional Culture, and Quality Culture Development. Research instruments that will be used in this research are surveys and archive analysis. The survey was conducted to collect data by means of interviews with experts and filling out questionnaires to respondents. Meanwhile, archive analysis was carried out to find out data from the object of research, alternative methods of implementation and development of quality culture research in construction service companies.

The instrument for the National Culture variable uses a questionnaire that has been widely used in research on national culture in companies, namely the Values Survey Module (VSM) developed by Hofstede based on decades of studies. The reason for choosing VSM is because the cultural dimensions of this instrument are the most widely used in studies related to national culture (Boscari et al., 2018; Choi et al., 2015; López-Duarte et al., 2016). In addition, the VSM dimension is also generated based on empirical research using modern statistical analysis methods, not the result of thinking (Hofstede, 2012). According to Vijesh Jain, the reasons why VSM is the most preferred by researchers are, firstly, the model provides good tools and is easy to use. Besides this model being tested many times, the second reason is that VSM is formulated based on research conducted in the workplace, so that the approach is closer to the world of work (Jain, 2014). This VSM module contains 24 questions related to the influence of cultural values and 6 questions related to the demographics of the respondents. The survey results describe the preferences of respondents to the six dimensions of national culture that were formulated previously. The Values Study Module (VSM) was last updated in 2013.

The Quality Management System (QMS) variable instrument adopts the internal audit standard ISO 9001:2015, which has been summarized by BSI into a Self -Assessment Checklist. To answer RQ 4, the results of RQ1, RQ2, and RQ3 were collected. Subsequently, a benchmarking analysis was carried out 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 using the Delphi method to get feedback from experts, academics, and wider practitioners (Lu et al., 2012; López-Duarte et al., 2016; Tam, 2008).

Analysis methods

Data analysis phase I

Phase I data analysis is a 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 or experts. The output of data analysis at this stage is content validation and construct validation of variable indicators.

Data analysis phase II

Phase II data analysis is a 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 who feel that the questionnaire is difficult to understand, improvements will be made to the

construct and content of the questionnaire. The output of data analysis at this stage is an indicator variable that is easily understood by respondents.

Data analysis phase III

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). The output of this stage analysis is:

- 1) Variables and indicators that are homogeneous, valid, reliable and have sufficient data
- 2) The value of T statistics from the relationship between variables. Furthermore, the results obtained from the R² bootstrapping carried out in SEM-PLS.

3 Results and Discussions

Dimensions/variables of national culture in quality culture development

Based on the national cultural literature study conducted by Hofstede (1980), there are 4 main aspects, namely power distance, uncertainty avoidance, individualism/collectivism, and masculinity/femininity. However, subsequent research added two different dimensions (Agodzo, 2014). The six aspects that make up Hofstede's current framework are: (Agodzo, 2014; Hofstede, 2011)

Table 1
Results of national culture dimensions/variables

No	Indicators
	Individualism/ Collectivism
A	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).
	Masculinity / Femininity
B	A society is called masculine when gender roles are clearly distinguished, for example, men should be firm, tough and focused on material success, while women should be more modest, gentle and concerned with the quality of life. A society is called feminine when gender roles are mixed with each other, for example, both men and women should be modest, gentle, and concerned with the quality of life (Hofstede et al., 2005).
	power distance
C	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 et al., 2005).
	Indulgence/ restraint
D	Indulgence is defined as "a society that allows the relatively free giving of basic and natural human desires related to enjoying life and having fun". Restraint is defined as "a society that controls the satisfaction of its needs and regulates it with strict social norms" (Hofstede, 2011).
	Long term/ short term orientation
E	Long term orientation (LTO) is a society with benevolent norms that are oriented towards future rewards, in particular, persistence and thrift. Meanwhile, short term orientation (STO) is a society that has virtue norms based on the past and present, in particular, respecting traditions, preserving "face" and fulfilling social obligations (Hofstede et al., 2005).
	Uncertainty avoidance
F	Uncertainty avoidance is the extent to which people in a society feel uncomfortable in unexpected, surprising, and unfamiliar situations, or unstructured situations. Unstructured situations are situations that are new, unknown, surprising, and different from usual.

After conducting a literature study followed by data collection and expert validation, it was found that from the 6 dimensions there are 5 dimensions or variables of national culture that can build a quality culture in construction service companies. Where the indicators of masculinity / femininity according to experts do not affect the development of a quality culture because in this modern era, the role of women is the same and equal to that of men in any field. There is no difference between women and men in terms of profession and career. Meanwhile, based on Hofstede's literature, this dimension is seen from 2 perspectives, namely feminine society and masculine society. In feminist society, they share a simple and discreet point of view with men. In masculine society, women are somewhat assertive and competitive, but especially inferior to men. In other words, they still recognize the gap between the values of men and women. This dimension is often considered taboo in highly masculine societies (Hofstede, 2011). The dimensions/variables that have been identified are as follows.

Table 2
Results of national cultural dimensions/variables according to expert validation

No	Indikator
	Individualism/ Collectivism
A	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).
	power distance
C	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 et al., 2005).
	Indulgence/ restraint
D	Indulgence is defined as "a society that allows the relatively free giving of basic and natural human desires related to enjoying life and having fun". Restraint is defined as "a society that controls the satisfaction of its needs and regulates it with strict social norms" (Hofstede, 2011).
	Long term/ short term orientation
E	Long term orientation (LTO) is a society with benevolent norms that are oriented towards future rewards, in particular, persistence and thrift. Meanwhile, short term orientation (STO) is a society that has virtue norms based on the past and present, in particular, respecting traditions, preserving "face" and fulfilling social obligations (Hofstede et al., 2005).
	Uncertainty avoidance
F	Uncertainty avoidance is the extent to which people in a society feel uncomfortable in unexpected, surprising, and unfamiliar situations, or unstructured situations. Unstructured situations are situations that are new, unknown, surprising, and different from usual.

Variables/indicators of quality management system implementation in quality culture development

LPJK issued regulation no. 12 / LPJK Year 2009 in connection with the re-registration of certificates of construction service companies in 2010. The regulation clearly states that all Class 7 construction companies (one of the best-qualified construction companies in Indonesia) must have a valid ISO 9001 certification in order to be eligible for carry out construction projects (Willar et al., 2015). ISO 9001:2015 has 7 clauses that contain requirements that must be carried out in implementing quality management. After conducting a literature study followed by data collection and expert validation, it was found that there were 7 variables/indicators of the implementation of the quality management system of construction service companies. The variables/indicators that have been identified are as follows.

Table 3
Results of variables/indicators of quality management system implementation

No	Indicators
	Organizational Context
A	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 the values, culture, knowledge and performance of the organization.
	Leadership
B	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.
	Planning
C	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.
	Supporter
D	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.
	Operational
E	The organization plans, implements and controls operational processes which include product and service requirements, product and service design and development, control of externally provided products and services, production and service provision and control of non-conforming outputs to improve QMS.
	Performance Evaluation
F	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.
	Enhancement
G	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 professional culture in quality culture development

From the literature study conducted by Nicholl, it was stated that Ulijn et al. (2001), stated that the study of occupational culture can be carried out using Hofstede's (1980), national cultural dimensions. Based on this statement, Herkenhoff (2009), then conducted research and proposed 5 dimensions of occupational culture, namely: Power, Risk, Gender, Time, and Team (Nicholls, 2016). After conducting a literature study followed by data collection and expert validation, it was found that there are 5 dimensions or variables of a professional culture that can build a quality culture in construction service companies. The dimensions/variables that have been identified are as follows.

Table 4
Results of dimensions/variables of professional culture

No	Indicators
A	Power Indicators of power relate to how differences in power are received and handled at work
	Time
B	The time indicator refers to the extent to which the professional group is focused on the long term. Professions with a long-term orientation will focus not on short-term outcomes and associated benefits but on those with far-

Amelia, T. M., & Latief, Y. (2022). Strategy for quality culture development of construction implementing service companies in running a quality management system based on professional culture and national culture to reduce construction failure rates. International Research Journal of Engineering, IT & Scientific Research, 8(4), 105-120. <https://doi.org/10.21744/irjeis.v8n4.2136>

No	Indicators
	reaching future outcomes and rewards. This may be related to the reward system and interpersonal relationships.
C	Risk Risk indicators relate to the degree to which risk taking is accepted and promoted in professional groups
	Gender
D	The profession indicator Gender refers to the extent to which the profession serves customers and pays attention to the workplace environment.
	Team
E	Team indicators refer to the degree to which the needs and wants of the group are more important than the individual

Strategy to build quality culture based on professional culture and national culture in the implementation of quality management system

Research variables and indicators

The conclusions that can be drawn from the data collection and analysis is the results of the literature study validated by experts, the variables and indicators that significantly affect the Leadership System variable directly are the Quality Management System and Professional Culture. Variables and indicators that significantly affect the Information Distribution variable directly are National Culture and Quality Management System.

Table 5
Outer loading bootstrapping

	Original Sample (O)	T Statistics (O/STDEV)
X1.A2 -> X1. National Culture	0,821	7,015
X1.C1 -> X1. National Culture	0,728	5,399
X2.A1 -> X2. Quality management system	0,791	15,206
X2.A3 -> X2. Quality management system	0,822	18,801
X2.A4 -> X2. Quality management system	0,723	10,442
X2.E10 -> X2. Quality management system	0,862	20,948
X2.E2 -> X2. Quality management system	0,766	11,751
X2.F1 -> X2. Quality management system	0,706	10,220
X3.B1 -> X3. Professional Culture	0,730	7,855
X3.E2 -> X3. Professional Culture	0,899	19,168
Y.I.A <- Y.I. Leadership System	0,875	36,037
Y.I.B <- Y.I. Leadership System	0,877	37,306
Y.I.C <- Y.I. Leadership System	0,933	76,412
Y.I.D <- Y.I. Leadership System	0,886	40,070
Y.I.E <- Y.I. Leadership System	0,929	67,332
Y.I.F <- Y.I. Leadership System	0,922	63,620
Y.I.G <- Y.I. Leadership System	0,915	63,636
Y.I.H <- Y.I. Leadership System	0,835	17,565
Y.II.A <- Y.II. Information Distribution	0,892	48,375
Y.II.B <- Y.II. Information Distribution	0,855	31,552
Y.II.C <- Y.II. Information Distribution	0,876	42,317
Y.II.D <- Y.II. Information Distribution	0,829	27,953
Y.II.E <- Y.II. Information Distribution	0,862	38,562
Y.II.F <- Y.II. Information Distribution	0,706	8,789
Y.II.G <- Y.II. Information Distribution	0,885	45,491
Y.II.H <- Y.II. Information Distribution	0,827	20,107
Y.II.I <- Y.II. Information Distribution	0,827	23,589
Y.II.J <- Y.II. Information Distribution	0,796	16,686
Y.II.K <- Y.II. Information Distribution	0,860	32,190

	Original Sample (O)	T Statistics (O/STDEV)
Y.II.L <- Y.II. Information Distribution	0,789	22,592
Y.II.M <- Y.II. Information Distribution	0,767	12,513
Y.II.N <- Y.II. Information Distribution	0,807	28,006
Y.II.O <- Y.II. Information Distribution	0,797	23,744
Y.III.A4 -> Y.III. Maturity Level	0,827	25,894
Y.III.A5 -> Y.III. Maturity Level	0,847	29,846
Y.III.B1 -> Y.III. Maturity Level	0,872	34,880
Y.III.B6 -> Y.III. Maturity Level	0,914	52,448
Y.III.B8 -> Y.III. Maturity Level	0,830	26,361
Y.III.C1 -> Y.III. Maturity Level	0,733	10,669
Y.III.C3 -> Y.III. Maturity Level	0,843	24,813
Y.III.C5 -> Y.III. Maturity Level	0,810	17,598
Y.III.D1 -> Y.III. Maturity Level	0,825	24,959
Y.III.D4 -> Y.III. Maturity Level	0,753	16,629
Y.III.D7 -> Y.III. Maturity Level	0,792	20,123
Y.III.D8 -> Y.III. Maturity Level	0,839	31,608

Based on the table above, there are indicators to measure it. It can be seen that not all indicators in the questionnaire that have been prepared are significant to explain the variables. Indicators and statements / questions that have a significant influence to explain the variables are found from the results of Outer Loadings above, which is one of the outputs of Bootstrapping.

Based on the results of the outer loading of SmartPLS with the Bootstrapping method, the indicators for each variable that are mutually influential or dominant are as follows:

- 1) X1.A2 indicator of the latent variable of National Culture on T Statistic value of $7.015 > 1.96$.
- 2) X1.C1 indicator on the latent variable of National Quality Culture on T Statistic value of $5.399 > 1.96$.
- 3) X2.A3 indicator on the latent variable of the Quality Management System on T Statistic value of $18,801 > 1.96$.
- 4) X2.E10 indicator on the latent variable of the Quality Management System on T Statistic value of $20.948 > 1.96$.
- 5) X3.B1 indicator of the latent variable of Professional Culture on T Statistic value of $7.855 > 1.96$.
- 6) X3.E2 indicator on the latent variable of Professional Culture on T Statistic value of $19.168 > 1.96$.

National culture in quality culture development

Variables of national culture in the development of quality culture are obtained from literature studies and expert validation, based on the process, the results are 5 out of 6 national culture variables which according to experts affect the development of quality culture in BUMN construction service companies in Indonesia. Based on the existing findings, the dimensions of masculinity/femininity were not identified as influencing the development of a quality culture because of the opinion of experts that in this modern era, women's roles are equal and equal to men in any field. There is no difference between women and men in terms of profession and career. The results of Hofstede's research using the VSM instrument, the score for the dimension of masculinity/femininity in Indonesia is 46. This means that Indonesia is considered a low masculine category (Raut et al., 2011; Buswell et al., 2007).

Quality management system implementation in quality culture development

Variables/indicators of the implementation of a quality management system in the development of a quality culture are obtained from literature studies and expert validation, based on the process, the results are 7 variables/indicators of the implementation of a quality management system which, according to experts, affect the development of a quality culture in BUMN construction service companies in Indonesia.

Professional culture in quality culture development

The variables of professional culture in the development of quality culture are obtained from literature studies and expert validation, based on the process, the results are 5 variables of professional culture which according to experts affect the development of quality culture in BUMN construction service companies in Indonesia.

*Strategy to build quality culture based on professional culture and national culture in the implementation of quality management system**Variable dominant effect*

Based on table 6 it can be concluded that the variables and indicators that have a dominant effect on Quality Culture Development are as follows:

Table 6
Variables dominant effect

No	Variable	Indicator	Definition	Statement
1	X1. National Culture	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.A2 Have job security
		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 et al., 2005).	X1.C1 Having a direct supervisor who can be respected
2	X2. QSM	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 the values, culture, knowledge and performance of the organization.	X2.A3 The organization defines the boundaries and application of the QMS to define its scope.
		Operational	The organization plans, implements and controls operational processes	X2.E10 The provision of products and services is

No	Variable	Indicator	Definition	Statement
3	X3. Professional Culture	Time	<p>which include product and service requirements, product and service design and development, control of externally provided products and services, production and service provision and control of non-conforming outputs to improve QMS.</p> <p>The time indicator refers to the extent to which the professional group is focused on the long term. Professions with a long-term orientation will focus not on short-term outcomes and associated benefits but on those with far-reaching future outcomes and rewards. This may be related to the reward system and interpersonal relationships.</p>	<p>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.</p> <p>X3.B1 My job requires a long term professional relationship.</p>
		Team	<p>Team indicators refer to the degree to which the needs and wants of the group are more important than the individual</p>	<p>X3.E2 My job has a strong team focus</p>

In the example of the construction failure case of the Becakayu Pier Head Formwork Collapse, Jakarta (February 2018), it is known from several sources obtained from the news and the internet, that the cause of the construction failure was the release of several brackets during casting. The cause of the detachment of the bracket during casting was due to insufficient bracket strength, poor installation (not according to SOP), and the bracket was not installed. This indication is related to human error due to a lack of supervision during implementation. Significantly late implementation time is also suspected to be the cause of the increased risk of human error, namely fatigue and lack of discipline (Al-Tmeemy et al., 2012; Abdelaal, 2019; Lim et al., 2012). Based on the results of the research on the dominant influencing variable, it can be seen that the dominant influencing indicator in table 8.6 is the indicator that influences the development of quality culture to reduce the construction failure rate. So it can be said that the construction failure of the Becakayu Pier Head Formwork Collapse did not implement the development of quality culture to the maximum, where one of the causes was time which in the results of the research above the time indicator is the dominant indicator in the development of 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 7
t-test for direct effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Description
X1 -> X3	0,393	0,398	0,077	5,088	0,000	Significant Direct Effect
X1 -> YII	0,171	0,166	0,084	2,022	0,044	Significant Direct Effect
X2 -> YI	0,475	0,484	0,091	5,197	0,000	Significant Direct Effect
X2 -> YII	0,441	0,461	0,103	4,299	0,000	Significant Direct Effect

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	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Description	
X3 -> X2	0,613	0,612	0,063	9,772	0,000	Significant	Direct Effect
X3 -> YI	0,276	0,264	0,081	3,417	0,001	Significant	Direct Effect
YII -> YIII	0,941	0,955	0,026	36,462	0,000	Significant	Direct Effect

National culture on information distribution

The National Culture variable has a significant effect on the distribution of information with a T Statistic value of 2.548 (T Statistic > 1.96). With indicators of Individualism/Collectivism and Power distance represented by 2 dominant statements X1.A2 and X1.C1. With 7.015 and 5.399 T Statistic values, respectively.

Quality management system on leadership system

The Quality Management System variable has a significant effect on the Leadership System with a T Statistic value of 4.147 (T Statistic > 1.96). With indicators of Organizational and Operational Context represented by 2 dominant statements X2.A3 and X2.E10. With each value of T Statistics 18.801 and 20.948.

Quality management system on information distribution

The Quality Management System variable has a significant effect on the Leadership System with a T Statistic value of 4.147 (T Statistic > 1.96). With indicators of Organizational and Operational Context represented by 2 dominant statements X2.A3 and X2.E10. With each value of T Statistics 18.801 and 20.948.

Professional culture on leadership system

The Professional Culture variable has a significant effect on the Leadership System with a T Statistic value of 6.040 (T Statistic > 1.96). With Time and Team indicators represented by 2 dominant statements X3.B1 and X3.E2. With each value of T Statistics 7,855 and 19,168.

From the results of the bootstrapping output above, 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 Power Distance) 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.
- 2) Indicator X3 (Time and Team) is an indicator that is influenced by indicator X1 and has a significant direct and indirect effect on X2, YI, YII and YIII. Therefore, the X3 indicator is recommended to be the next priority for handling.
- 3) Whereas Indicator X2 (Organizational Context, Operational and Performance Evaluation) is an indicator that is influenced by indicators X1 and X3, and has a significant direct and indirect effect on YI, YII, and YIII. Therefore, the X2 indicator is recommended to be the next priority to be handled in order to improve the quality culture through Information Distribution and Maturity Level

Experts agree that all variables and indicators in the table affect the improvement of quality culture. The recommendations for improving the quality culture obtained from the experts are as follows:

- 1) The company prioritizes work safety commitment as an indicator of performance appraisal.
- 2) Selection of leaders who are capable and can be respected by subordinates.
- 3) Everyone who is appointed to a certain position must understand and master the Quality Management System to carry out its scope.
- 4) Making social media a means of information and documentation to ensure the implementation of the Quality Management System.

- 5) Maintain integrity and professionalism according to their area of expertise and respect each other.
- 6) Maintain team cohesiveness and mutual respect among team members.

4 Conclusion

In this study, there are four problem formulations that must be answered at each stage of the research carried out. The answers to each of these problem formulations are discussed in the findings and discussion chapters. In accordance with the purpose of this study, it can be concluded four things as follows.

- 1) At the indication stage of the National Culture variables related to the development of Quality Culture in construction service companies, the variables are as follows:
 - a. Individualism/ Collectivism
 - b. power distance
 - c. Indulgence/ Restraint
 - d. Long-term/Short-term orientation
 - e. Uncertainty avoidance

With dominant indicators of individualism/collectivism and power distance represented by 2 statements, namely X1.A2 and X1.C1.

- 2) At the identification stage of the Quality Management System variables related to the development of Quality Culture in the construction service company, the variables obtained are as follows:
 - a. Organizational Context
 - b. Leadership
 - c. Planning
 - d. Supporter
 - e. Operational
 - f. Performance Evaluation
 - g. Enhancement

With dominant indicators of organizational and operational context represented by 2 statements, namely X2.A3 and X2.E10.

- 3) At the indication stage of the Professional Culture variables related to the development of Quality Culture in construction service companies, the dominant variables are as follows:
 - a. Power
 - b. Time
 - c. Risk
 - d. Gender
 - e. Team

With the dominant indicators of time and team are represented by 2 statements, namely X3.B1 and X3.E2.

- 4) The strategy to build a Quality Culture based on Professional Culture and National Culture in the Implementation of the Quality Management System is as follows:
 - a. The company prioritizes work safety commitment as an indicator of performance appraisal.
 - b. Selection of leaders who are capable and can be respected by subordinates.
 - c. Every person appointed to a certain position must understand and master the Quality Management System to carry out its scope.
 - d. Making social media a means of information and documentation to ensure the implementation of the Quality Management System.
 - e. Maintain integrity and professionalism according to their area of expertise and respect each other.
 - f. Maintain team cohesiveness and mutual respect among team members.

Suggestion

- 1) There is a need for research that covers boundaries that do not only focus on BUMN construction service companies in Indonesia, but includes all construction service companies in Indonesia.

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- 2) There is a need for further research to measure the implementation of the given strategy whether there are changes to the leadership system, information distribution, and maturity level in the implementation of quality culture within a certain period of time, then the updated strategy can be investigated further to produce maximum conditions and can periodically upgraded.

Conflict of interest statement

The authors declared that's 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.

Acknowledgments

We are grateful to two anonymous reviewers for their valuable comments on the earlier version of this paper.

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