



IMPACT OF NATIONAL CULTURE ON TOTAL QUALITY MANAGEMENT PRACTICES IN THE CAMBODIAN CONSTRUCTION INDUSTRY

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ABSTRACT

National culture can influence management practices in any business. Therefore, the impact of national culture on management practices should be examined to minimize conflicts and improve productivity. This study aims to examine the relationship between national culture and total quality management practices in the construction industry. Within this context, a case study was carried out in the Cambodian construction industry. A questionnaire survey was conducted among 84 professionals from 26 construction companies operating in the Cambodian construction industry. Hofstede's cultural dimensions were used to interpret the study findings. Based on the results, leadership, system approach to management, and customer focus are determined as the most significant total quality management principles. Moreover, uncertainty avoidance, individualism/collectivism, and power distance were found as the most important dimensions influencing total quality management practices. The study findings can help professionals to better understand the role of national culture in implementing total quality management practices in the Cambodian construction industry.



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1. INTRODUCTION

Quality is an essential parameter for the success in construction projects (Panwar & Jha, 2021; O'Connor & Koo, 2021; Tepaskoualos & Chountalas, 2017; Kam et al, 2012; Ali, 2014). Quality is defined as “suitability for usage” (Juran & Gryna, 1993), “conformance to necessity” (Crosby, 1979), and “the planned aims that are concentrated towards customer’s favorites, enjoys, flavors, and claims” (Ishikawa, 1990). According to Arditi & Gunaydin (1997), quality in the construction industry can be defined as meeting the requirements of the designer, constructor and regulatory agencies as well as the owner. Providing the satisfaction of the customer’s need is the core feature in all these meanings (Ho, 1994).

Total quality management (TQM) is a management model that aims to meet customer needs and expectations within an organization through continuous improvement of the quality of goods and services and by integrating all functions and processes within an organization (Prajogo & McDermott, 2005). TQM can be used globally for improving quality and productivity (Deming, 1986). It is an approach to improving the competitiveness, effectiveness, and flexibility of the whole organization (Pheng & Teo, 2004; Noronha, 2003). According to Ishikawa (1985), quality improvement is a continuous and never-ending process. Many researchers stated that International Organization for Standardization (ISO) 9000 can be one of the first phases before implementing TQM (Kemp, 2006; Besterfield et al, 1995; Texeira-Quirós et al, 2010). The ISO 9000 family is the world’s

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well-known quality management standard for companies and organizations (International Organization for Standardization, 2021). ISO 9001 sets out the criteria for a quality management system. This standard is based on a number of quality management principles including a strong customer focus, the motivation and implication of top management, the process approach and continual improvement (International Organization for Standardization, 2021).

Implementing TQM in the construction industry is highly significant to improve quality and productivity (Pheng & Teo, 2004). Many studies have been conducted related to the implementation of TQM in the construction industry (Acikara et al, 2017). According to the researchers, a complete turnaround in corporate culture and management approach is required for the implementation of TQM (Pheng & Teo, 2004; (Quazi & Padibjo, 1997). For this purpose, it is recommended to follow the TQM principles which are given as follows (Bradley, 1994):

- customer focus (ensuring current products and/or services deliver customer satisfaction will continue to do so in the future)
- leadership (managers' clear involvement in promoting and leading quality improvement)
- involvement of people (encouragement of company-wide (i.e. all departments) contribution to quality improvement)
- process approach (improvement in processes used in delivering output to both external and internal customers)
- system approach to management (adoption of systems to delivery consistent products and services)
- continual improvements (planning and setting goals for quality improvements)
- factual approach (use of information resources in the drive for quality improvement)
- supplier relationship (the use of high-regard, interdependent and mutually beneficial supply chain to create value)

Moreover, Low & Peh (1996) outlined the following basic steps to successfully implement TQM in construction projects:

- obtain the commitment of the client to quality
- generate awareness, educate, and change the attitudes of staff
- develop a process approach toward TQM
- prepare project quality plans for all levels of work
- institute continuous improvement
- promote staff participation and contribution using quality control circles and motivation programs
- review quality plans and measure performance.

Cambodia is a developing country where the construction industry plays an important role in the development of the country's economy. The construction industry accounts for almost 7% of the total GDP of Cambodia for each year (Min et al, 2016). Durdyev et al (2016) conducted a SWOT (strengths, weaknesses, opportunities, and threats) analysis of the Cambodian construction industry. Based on their study, the strengths include low-paid labour force, consistent growth in GDP in last decade, compelling financial and regulatory incentives toward foreign direct investment, and driving demand for infrastructure. The weaknesses are found as poor existing infrastructure, excessive red tape, lack of financial and regulatory systems, shortage of skilled workforce, and lack of construction law and regulations. The opportunities are listed as geographical location, demand for international expertise, and room for infrastructure improvement. Finally, the threats are determined as high dependency on non-ASEAN foreign construction investors, weakness towards the external risks due to the insufficient local infrastructure, cash outflow due to the imported construction materials, and out-migrating local skilled workforce.

Culture is an important factor that should be considered to minimize conflicts and improve productivity in TQM practices (Nikolic & Nastasic, 2010; Yoo et al, 2006; Islam & AlNasser, 2013). However, there have been relatively few studies that have examined the influence of national culture on TQM practices in construction (Babatunde & Pheng, 2015a). Moreover, the impacts of national culture on TQM practices in the Cambodian construction industry have not been investigated yet. Thus, this study aims to fill this gap by examining the relationship between national culture and TQM practices in this industry. Within this context, Hofstede's (1980) cultural dimensions were used to interpret the study findings.

2. CULTURAL DIMENSIONS OF HOFSTEDE

Culture is defined in numerous ways according to the research areas. Hofstede (1980) defined culture as "the collective programming of the mind which distinguishes one group from another". In the literature, several cultural dimensions have been suggested (Trompenaars, 1993; Schwartz, 1997; Gesteland, 2002; Hall, 1976). Hofstede's cultural dimensions were selected for this study since they have been widely used in cross-cultural studies (Silverthorne, 2005). According to Tata & Prasad (1998), Hofstede's (1980) work is particularly suited for understanding TQM implementation. Hofstede (1980) identified four dimensions of national culture: power distance (PDI), masculinity/femininity (MAS), individualism/collectivism (IDV), and uncertainty avoidance (UAI). Later, another cultural dimension called long vs short-term orientation (LTO) was added as the fifth dimension and in 2010 indulgence versus restraint (IVR) was added as the sixth cultural dimension

(Hofstede et al, 2010). IVR has not been included in this study since this dimension has not been extensively used in cross-cultural studies when compared to other dimensions (Babatunde & Pheng, 2015b).

PDI is “the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally” (Hofstede, 2010). In cultures with a high PDI score, employees’ participation in decision making is not expected. The IDV dimension is “the extent to which individuals are integrated into groups” (Hofstede, 1980). In cultures with a high IDV score, ties between individuals are loose. UAI is “the extent to which the members of a culture feel threatened by uncertain or unknown situations” (Hofstede et al, 2010). In cultures with a high UAI score, members of a society support beliefs that promise certainty and conformity. MAS is defined as “a situation in which the dominant values in

society are success, money, things and femininity as a situation in which the dominant values in society are caring for others and the quality of life” (Hofstede et al, 2010). In cultures with a high MAS score, power and money are promoted motivators and there is a high degree of gender differentiation. On the other hand, in cultures with a low LTO score, societies prefer to maintain time-honoured traditions and norms while viewing societal change with suspicion.

Cambodia was not included in the study of Hofstede (1980) thus, has no scores for any cultural dimension. However, Cambodian culture can be compared with other Asian countries. Berkvens (2017) stated that Thai culture is the most similar one than other Asian countries’ culture because of its cultural standpoint and geography. Hofstede’s cultural dimension scores for some countries, including Thailand, are illustrated in Table 1 (Hofstede et al, 2010).

Table 1. Hofstede’s cultural dimension scores

Country	PDI	IDV	MAS	UAI	LTO
Argentina	49	46	56	86	20
Bangladesh	80	20	55	60	47
Belgium	65	75	54	94	82
Bulgaria	70	30	40	85	69
Canada	39	80	52	48	36
China	80	20	66	30	87
Croatia	73	33	40	80	58
France	68	71	43	86	63
Germany	35	67	66	65	83
Greece	60	35	57	100	45
India	77	48	56	40	51
Japan	54	46	95	92	88
Malaysia	100	26	50	36	41
Montenegro	88	24	48	90	75
Netherlands	38	80	14	53	67
Philippines	94	32	64	44	27
Russia	93	39	36	95	81
Serbia	86	25	43	92	52
Saudi Arabia	95	25	60	80	36
Thailand	64	20	34	64	32
Turkey	66	37	45	85	46
United Kingdom	35	89	66	35	51
United States	40	91	62	46	26

Based on the study of Hofstede et al (2010), Thailand has a PDI score of 64. This PDI value indicates that Thai culture respects to hierarchy, protocol and accept inequality (Berkvens, 2017). Thailand has a low IDV index (20) that represents a collectivist culture. Thailand is a feminine society with a low MAS index (34). Feminine cultures value cooperation, modesty, security, caring for the weak, and quality of life (Hofstede et al, 2010). Thailand has a high UAI index (64) that means the society does not readily accept change and is very risk adverse. Moreover, a low LTO index (32) indicates that Thai culture is more normative than pragmatic, and people exhibit great respect for traditions (Hofstede et al, 2010).

3. METHODOLOGY

A questionnaire survey was used to examine the relationship between national culture and total quality management practices. Detailed explanations about TQM principles and national cultural dimensions are provided in the questionnaire. The questionnaire was conducted among professionals, including civil engineers, architects, site engineers, and project managers, from 26 construction companies operating in the Cambodian construction industry. The questionnaire was adapted from Babatunde & Pheng (2015b). Babatunde & Pheng (2015b) designed and tested a model integrating the attributes of national culture and TQM principles for successful TQM implementation in international projects. A total of 120 questionnaires were

directly distributed to the participants. Moreover, where applicable, face-to-face interviews with the participants were conducted in order to obtain detailed information about the subject. Purposive sampling was used as the sampling method. Purposive sampling is a non-probability sampling method to identify relevant participants (Welman & Kruger, 1999) and is one of the most time-effective sampling methods (Devers & Frankel, 2000). Moreover, purposive sampling allow the researcher to deliberately select participants based on prior knowledge (Denscombe, 2010). Participants were selected from both foreign-owned and locally-owned construction companies in Cambodia. Cambodian professionals having experience in working with people from different cultural backgrounds were selected. The questionnaire form was translated to Cambodia’s official language, Khmer, to give a better understanding to the participants who are not fluent in English.

4. RESULTS AND DISCUSSIONS

In total, 84 participants completed the questionnaires, with a response rate of 70%. The demographic data of the participants are summarized in Table 2. A total of 26 companies participated in this study. Table 3 presents some information about these companies. The respondents were asked to rank the TQM principles using a scale of 1 to 8, where 1 denotes the most significant principle and 8 denotes the least significant principle. The results are presented in Table 4. Total scores are determined based on the multiplication of the significance level and frequency. Thus, the lowest total score is determined as the most significant principle. Based on the results, leadership, system approach to management, and customer focus are found as the most significant TQM principles, respectively. Almost half (46.4%) of the participants ranked leadership as the first important principle.

Table 2. Demographic data of the participants

Variable	Classification	Frequency	Percentage
Gender	Male	74	88.1
	Female	10	11.9
Age	≤24	7	8.3
	25-34	70	83.3
	34-44	7	8.3
Education level	BSc	73	86.9
	MSc	11	13.1
Occupation	Civil Engineer	72	85.7
	Architect	8	9.5
	Mechanical Engineer	2	2.4
	Electrical Engineer	1	1.2
	Geotechnical Engineer	1	1.2
Position	Site Engineer	28	33.3
	Structural Engineer	21	25.0
	CAD Operator	10	11.9
	QA/QC/QS	7	8.3
	Architect	6	7.1
	Site Manager	4	4.8
	Project Manager	3	3.6
	Technical Engineer	3	3.6
	Sales Engineer	2	2.4
Experience in the Construction Industry (years)	1-5	68	80.9
	6-10	14	16.7
	11-15	1	1.2
	16-20	1	1.2

Table 3. Company profiles

	Classification	Frequency	Percentage
Company type	Main contractor	8	30.8
	Developer	8	30.8
	Consultant	7	26.9
	Material supplier	2	7.7
	Subcontractor	1	3.8
Company size	Small	5	19.2
	Medium	11	42.3
	Large	10	38.5

Table 4. Ranking of TQM principles

Relative Rank	TQM Principle	Significant Ranks (a)	Frequency (b)	(a*b)	Total
1	Leadership	1	39	39	214
		2	15	30	
		3	6	18	
		4	9	36	
		5	8	40	
		6	1	6	
		7	3	21	
		8	3	24	
2	System Approach to Management	1	11	11	261
		2	33	66	
		3	13	39	
		4	11	44	
		5	6	30	
		6	3	18	
		7	3	21	
		8	4	32	
3	Customer Focus	1	16	16	336
		2	8	16	
		3	13	39	
		4	13	52	
		5	8	40	
		6	12	72	
		7	11	77	
		8	3	24	
4	Involvement of People	1	10	10	337
		2	13	26	
		3	15	45	
		4	14	56	
		5	11	55	
		6	7	42	
		7	9	63	
		8	5	40	
5	Process Approach	1	7	7	341
		2	11	22	
		3	17	51	
		4	16	64	
		5	14	70	
		6	10	60	
		7	5	35	
		8	4	32	
6	Factual Approach	1	1	1	494
		2	1	2	
		3	8	24	
		4	5	20	
		5	17	85	
		6	18	108	
		7	18	126	
		8	16	128	
7	Supplier Relationship	1	0	0	515
		2	2	4	
		3	4	12	
		4	9	36	
		5	11	55	
		6	17	102	
		7	22	154	
		8	19	152	
8	Continual Improvement	1	0	0	526
		2	1	2	
		3	8	24	
		4	7	28	
		5	9	45	
		6	16	96	
		7	13	91	
		8	30	240	

The respondents were asked to rank the cultural dimensions according to their possible impact on TQM practices, using a scale of 1 to 5, where 1 denotes the most significant principle and 5 denotes the least significant principle. Table 5 illustrates the findings. The lowest total score is determined as the most significant

dimension. Based on the analysis, UAI, IDV, and PDI are considered as the most significant dimensions that have a negative impact on TQM practices, respectively. On the other hand, almost half (46.4%) of the participants ranked MAS as the least important dimension.

Table 5. Ranking of cultural dimensions

Relative Rank	Cultural Dimension	Significant Ranks (a)	Frequency (b)	(a*b)	Total
1	UAI	1	21	21	228
		2	23	46	
		3	13	39	
		4	13	52	
		5	14	70	
2	IDV	1	20	20	234
		2	17	34	
		3	19	57	
		4	17	68	
		5	11	55	
3	PDI	1	17	17	235
		2	18	36	
		3	23	69	
		4	17	68	
		5	9	45	
4	LTO	1	21	21	237
		2	18	36	
		3	11	33	
		4	23	92	
		5	11	55	
5	MAS	1	5	5	326
		2	8	16	
		3	18	54	
		4	14	56	
		5	39	195	

The interview findings supported the results of the quantitative study. In the interviews, the respondents were asked to consider the TQM principles and their relationship with the national cultural dimensions. Where necessary, additional information about these concepts was provided to the respondents during the interviews. Based on the analysis of the interviews, leadership, system approach to management, customer focus, and involvement of people were highlighted by the majority of the participants as critical principles that may be influenced by national culture. Leadership has been correlated with UAI, PDI, and IDV. According to the interviewees, establishing trust and eliminating fear, encouraging people’s contributions, and providing people the required training and freedom within the organization are critical practices which can be correlated with the above-mentioned dimensions. Organizations in high PDI, high UAI, and low IDV countries such as Cambodia may face more problems in the implementation of these practices. System approach to management has been correlated with PDI and IDV. Most of the interviewees mentioned that the roles and responsibilities should be clearly provided to the employees to achieve common objectives. This can be correlated with the dimensions of PDI and IDV. Similarly, organizations in high PDI and low IDV countries may encounter difficulties in this process. In

the interviews, customer focus has been correlated with UAI, PDI and IDV. Many respondents highlighted the importance of managing customer relationships, understanding customer’s needs and expectations, and the strategy for customer satisfaction. Organizations in high PDI, high UAI, and low IDV countries may face more problems in dealing with these issues. Finally, involvement of people has been correlated with PDI and IDV. During the interviews, sharing knowledge and experiences, opportunities to enhance their competence, and understanding the importance of their contribution and role in the organization are mentioned as important issues by the respondents. A high PDI and low IDV may lead to difficulties in performing these activities

The findings correlate well with previous studies. Tata & Prasad (1998) designed a model to explain the impact of national culture on the effectiveness of TQM implementation. According to Tata & Prasad (1998), PDI and UAI have direct connections to control-flexibility value-orientations and to mechanistic-organic structures. The researchers stated that organizations in high PDI countries such as Thailand, China, and Malaysia (Hofstede et al, 2010) may face problems in the implementation of TQM practices since they are more likely to have centralized control over decision-making, and have control-oriented cultures and mechanistic

structures (Tata & Prasad, 1998). On the other hand, in low PDI countries such as Canada, Germany, and the United Kingdom, organizations are more successful in TQM implementation due to their flexibility-oriented cultures and organic structures (Tata & Prasad, 1998). Furthermore, in high UAI countries such as Thailand, Turkey, and Russia (Hofstede et al, 2010), organizations have control-oriented value systems and mechanistic structures that result in failures in implementing TQM practices (Tata & Prasad, 1998). Additionally, in high UAI countries changes are often seen as threats that may also lead to significant challenges in TQM implementation. On the other hand, in low UAI countries such as the United Kingdom and the United States (Hofstede et al, 2010), organizations are more successful in TQM implementation because employees are more flexible in the decision making process and the companies have flexibility-oriented cultures (Tata & Prasad, 1998). According to the study of Lagrosen (2003), UAI and IDV have an influence on TQM values. Lagrosen (2003) found that quality managers from countries with a more collectivist culture tend to put emphasis on those customers that they have already developed a good relationship with. Lagrosen (2003) also stated that in high UAI cultures there may be difficulties in the implementation of continuous improvements. Vecchi & Brennan (2009) found that PDI, IDV, MAS, and UAI significantly affect quality practice and PDI, IDV, and UAI affect quality performance to a greater extent. Jung et al (2008) determined that PDI has influences on all TQM elements, and MAS has positive impact on business performance of TQM practices. Mardani & Kazemilari (2012) found that UAI has influences on two TQM elements (information and analysis and human resources focus), IDV negatively influences information and analysis but has a positive affect on process management and business performance. Based on their study, PDI is the most impactful dimension that affects all TQM elements.

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In this study, questionnaires were distributed only to Cambodian professionals. Moreover, the study focused only on the impact of national culture on TQM practices. Future studies including professionals from different cultural backgrounds and the impact of organizational culture on TQM can strengthen the findings.

5. CONCLUSIONS

In this study, the possible impact of national culture on TQM practices in the Cambodian construction industry was examined. Data were collected through a questionnaire survey among professionals from construction companies operating in the Cambodian construction industry. The data were interpreted using Hofstede's cultural dimensions. Based on the results, leadership, system approach to management, and customer focus are determined as the most significant TQM principles. Moreover, UAI, IDV, and PDI were found as the most significant dimensions influencing TQM practices.

Although there are no direct solutions to overcome the challenges of national culture, its impact on TQM practices can be minimized through several approaches. Managers should take into account the national cultural differences in the implementation of TQM practices. National cultural dimensions should be carefully examined and companies should establish a strategy to minimize the effects of national culture. It is expected that the results of this study will contribute to a wide range of stakeholders of the Cambodian construction industry. The findings will provide benefits to national and international construction companies who are interested in implementing TQM practices by creating awareness of the existing challenges.

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