



**IMPACTS OF CULTURAL DIFFERENCES ON
QUALITY MANAGEMENT SYSTEMS
IN CONSTRUCTION INDUSTRY IN CAMBODIA**

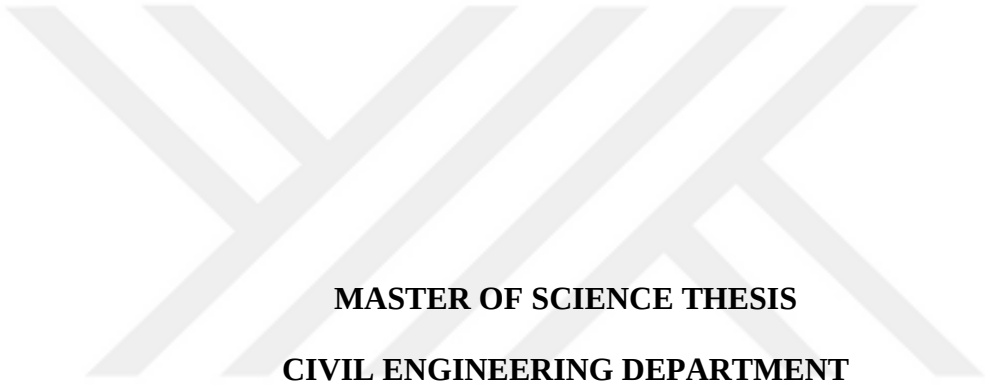
Master of Science Thesis

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Eskişehir, June 2019

**IMPACTS OF CULTURAL DIFFERENCES ON QUALITY MANAGEMENT
SYSTEMS IN CONSTRUCTION INDUSTRY IN CAMBODIA**

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June 2019

FINAL APPROVAL FOR THESIS

This thesis titled “IMPACTS OF CULTURAL DIFFERENCES ON QUALITY MANAGEMENT SYSTEMS IN CONSTRUCTION INDUSTRY IN CAMBODIA” has been prepared and submitted by Sengthoeun SAY in partial fulfillment of the requirements in “Anadolu University Directive on Graduate Education and Examination” for the Degree of Master of Science in Civil Engineering Department has been examined and approved on 11/06/2019.

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ABSTRACT

IMPACTS OF CULTURAL DIFFERENCES ON QUALITY MANAGEMENT SYSTEMS IN CONSTRUCTION INDUSTRY IN CAMBODIA

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Anadolu University, June 2019

Supervisor: Assoc. Prof. Dr. Serkan KIVRAK

Considering the national diversities of worker, architect, engineer, investors who have been working in construction sector in Cambodia, this study covers what are the impacts of cultural differences on quality management systems on this sector in Cambodia. It includes some review of relevant elements for achieving good quality management in construction sector such as TQM, NCDs, Hofstede's cultural dimension and also a brief information of construction industry in Cambodia. This study is mainly focusing on the perceive on influences of national culture on quality management of the Cambodian construction practitioners who have been working with foreigners. A survey has been made with 84 Cambodian respondents from 26 different construction firms (e.g. consultant, contractor, architecture) operating in Cambodia, was conducted from December 2018 to January 2019. The results of this study showed that the five cultural dimensions of Hofstede namely UAI, IDV, PDI, LTO, and MAS, the eight principles of TQM are ranked leadership, system approach, customer focus, involvement of people, process approach, factual approach, supplier relationship, and continual improvement, are ranked as the most to the least significantly respectively to achieving good quality. In addition, the result of this study also revealed that the perceived influence of the TQM principles and NCDs on quality among the Cambodians is a significant difference both for self and for the foreigners. The findings of this research will provide the key to understanding the Cambodian national cultural perception which should be considered for eliminating misunderstanding, and conflicts in construction sector in Cambodia.

Keywords: TQM, NCDs, Quality Management, Hofstede's Cultural Dimension, Construction Industry.

ÖZET

KAMBOÇYA'DAKİ İNŞAAT ENDÜSTRİSİNDE KALİTE YÖNETİM SİSTEMLERİ ÜZERİNDE KÜLTÜREL FARKLILIKLARIN ETKİLERİ

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Kamboçya'da inşaat sektöründe çalışmakta olan işçilerin, mimarların, mühendislerin, inşaatçıların ulusal çeşitliliği göz önüne alınarak, bu çalışmada kültürel farklılıkların Kamboçya'daki bu sektördeki kalite yönetim sistemleri üzerindeki etkileri gösterilmektedir. TQM, NCD'ler, Hofstede'nin kültürel boyutları ve ayrıca Kamboçya'da inşaat endüstrisinin kısa bir tanımlanması gibi inşaat sektöründeki iyi kalite yönetimine ulaşmak için bazı ilgili unsurların gözden geçirilmesi içermektedir. Bu çalışma esas olarak, ulusal kültürün, yabancılarla çalışmakta olan Kamboçyalı inşaat uygulayıcılarının kalite yönetimi üzerindeki etkilerinin algılanmasına odaklanmaktadır. Kamboçya'da faaliyet gösteren 26 farklı inşaat firmasından 84 Kamboçyalı katılımcının (örneğin; danışman, müteahhit, mimarlık) katılımlarıyla Aralık 2018 - Ocak 2019 tarihleri arasında bir anket yapılmıştır. Bu çalışmanın sonuçları, Hofstede'nin beş kültürel boyutunun, UAI, IDV, PDI, LTO ve MAS'sinin, TQM'nin sekiz ilkesinin, liderlik, sistem yaklaşımı, müşteri odaklılığı, insanların katılımı, süreç yaklaşımı, olgusal yaklaşım, tedarikçi ilişkisi ve sürekli gelişmesinin, iyi kaliteye ulaşmak üzere sırasıyla en önemliden en azına olarak sıralandıklarını göstermektedir. Ayrıca, bu çalışmanın sonuçları, TQM ilkelerinin ve NCD'lerin Kamboçyalılar arasında kalite üzerindeki algılanan etkisinin hem kendileri hem de yabancılar için önemli bir fark olduğunu ortaya koymuştur. Bu araştırmanın bulguları, Kamboçya'daki inşaat sektöründe yanlış anlayışlar ve çatışmaları ortadan kaldırmak için dikkate alınması gereken Kamboçya ulusal kültürel algısını anlamada katkı sağlayacaktır.

Anahtar Sözcükler: TQM, NCDs, Kalite Yönetimi, Hofstede'nin Kültürel Boyutu, İnşaat Sektörü.

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STATEMENT OF COMPLIANCE WITH ETHICAL PRINCIPLES AND RULES

I hereby truthfully declare that this thesis is an original work prepared by me; that I have behaved in accordance with the scientific ethical principles and rules throughout the stages of preparation, data collection, analysis and presentation of my work; that I have cited the sources of all the data and information that could be obtained within the scope of this study, and included these sources in the references section; and that this study has been scanned for plagiarism with “scientific plagiarism detection program” used by Anadolu University, and that “it does not have any plagiarism” whatsoever. I also declare that, if a case contrary to my declaration is detected in my work at any time, I hereby express my consent to all the ethical and legal consequences that are involved.

11/06/2019

Sengthoeun SAY

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LIST OF ABBREVIATIONS

ACMECS	Ayeyawady-Chao Phraya-Mekong Economic Cooperation
ADB	Asian Development Bank
AEC	ASEAN Economic Community
AIIB	Asian Infrastructure Investment Bank
ANOVA	Analysis of Variance
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
BOT	Build–operate–transfer
CAD	Computer-aided design
CCA	Cambodia Constructors Association
CCPs	Cambodian Construction Practitioners
CDC	Council for the Development of Cambodia
CNPA	Cambodian National Petroleum Authority
CRBC	China Road and Bridge Corporation
CVS	China Value Survey
DP	Deming Prize
e.g.	for example
EQA	European Quality Award
EU	European Union
EUR	European Monetary Unit
FDI	Foreign Direct Investment
Fr	Friedman test
GDP	Gross Domestic Product
GLOBE	Global Leadership and Organizational Behavior Effectiveness
GMS	Greater Mekong Sub-region
GNI	Gross National Income
IBM	International Business Machines
ICSID	International Center for Settlement of Investment Disputes
ICT	Information and Communication Technologies
IDV	Individualism
ILO	International Labor Organization (United Nations)

IMF	International Monetary Fund
ISO	International Organization for Standardization
IVR	Indulgence Versus Restraint
JICA	Japan International Cooperation Agency
KHR	Cambodian Riel
Km ²	square kilometer
LTO	Long-Term Orientation
MAS	Masculinity
MBNQA	Malcolm Baldrige National Quality Award
MFIs	Microfinance Institutions
MIGA	Multilateral Investment Guarantee Agreement
NBC	National Bank of Cambodia
NC	National Culture
NCDs	National Culture Dimensions
NQAs	National Quality Awards
NY	New York
OCA	Overlapping Claims Area
OCIC	Oversea Cambodian Investment Corporation
OPIC	Overseas Private Investment Corporation
PDI	Power Distance
PPAP	Phnom Penh Autonomous Port
QA	Quality Assurance
QC	Quality Control
QMSs	Quality Management Systems
QS	Quality Surveyor
ROI	Return on Investment
SPSS	Statistical Package for Social Sciences
SWOT	Strengths, Weaknesses, Opportunities and Threats
TQM	Total Quality Management
U.S.	United States
UAI	Uncertainty Avoidance
UN	United Nations
UNTAC	United Nations Transitional Authority in Cambodia

USA	United States of America
USAID	United States Agency for International Development
WB	World Bank
WCO	World Customs Organization
WTO	World Trade Organization
WVS	World Value Sur



1. INTRODUCTION

Culture is defined in numerous definitions. According to Hofstede et al. (2010, p. 6) culture is considered to be a collecting mind programming which divides one society, one group, one organization of people from others. The comparable of two cultures is called national culture which is created from a formulated application of culture at any layer of the society. (Hofstede, 1980, p. 26). Hofstede et al. (1991), to compare two cultures, have established their national culture dimension framework into five dimension. Those five NCDs of them are PDI (power distance), IDV (individualism vs collectivism), MAS (masculinity vs femininity), UAI (uncertainty avoidance), and LTO (long-term orientation vs Short-term Orientation), (see Section 2.3.3.1 for more detailed).

According to Besterfield et al. (1995), TQM (total quality management) is defined as the inventive management of everything to attain the greatness result. In addition, TQM is an approach or concept which should be adopted as initiative in construction industry to solve the problems and meet the final customer (Kanji and Wong, 1998); it can be used globally for improving quality and productivity (Crosby, 1979; Deming, 1986). In consequence, Low and Teo's (2004) work shows that the translation, integration, and ultimately institutionalization of everyday use in work of TQM attitudes are the abilities of successful TQM implementation.

Many reports from both governments and business organization (e.g., Gyles and Yeldham, 1992, and Latham, 1994) have reported that the construction sector is low performance, delay, rework, material wasting, and less fulfill of customer satisfaction. Quality is an attribute that causes often poor performance in construction industry and difficult to ensure, thus lead to conflict and confrontational relations between the parties (Kanji and Wong, 1998). To achieving a successful TQM implementation approach, it is necessity to identify and react the cultural difficulties (Jones and Seraphim, 2008).

From foregoing, it is necessary to investigate how the cultural differences between the Foreigners and the Cambodian, thus it is a key driving the Cambodia construction sector to achieving high quality. Research question in this study is whether the quality management in construction sector is affected by the national culture; therefore, this study will investigate the liaison of the NC and TQM in the construction field context in Cambodia.

1.1. Gap of Study

Since now, the study of impacts of national culture on the quality management has not yet explored in the construction sector of Cambodia. In addition, the study of the impacts of the national culture between the Cambodian construction practitioners and the foreigners in the perception to getting high quality in construction sector in Cambodia has not yet studied too. Responding to this gap, the using the five dimension of Hofstede' work could be help foreign construction firms continuously run in Cambodia.

For the results presented in this thesis, a respondent or a Cambodian is presented as an engineer (e.g., civil engineer, consultant, architect, site engineer, project manager) working in foreign-owned or Cambodian-owned, who have experiences working with in the construction sector in Cambodia. Particularly, it is requiring all the respondents have been worked/working with foreigners in the field as previously mentioned.

1.2. Objectives and Aim of Research

This research is an investigation that could be able to find the cultural differences between the foreigners and the Cambodian to improve good-quality performance on construction management service in Cambodia. The objectives are:

- 1) Review literature to explore the effects of national cultures on TQM (Total Quality Management) application in the multi-nation firms.
- 2) Explore the effects of the importance principles and attributes of the TQM that affects construction quality in Cambodia recognized by the Cambodian to the foreigners.
- 3) Explore the effects of the importance dimensions and attributes of the NCDs that affects construction quality in Cambodia recognized by the Cambodian to the foreigners.

1.2.1. Hypothesis of study

By responding to the objectives and aim of this study, a hypothesis below is exposed with two sub-hypotheses.

Hypothesis: *Differences exist in the perceptions of the influences of national culture and TQM principles on the management of quality of the Cambodian.*

The corresponding sub-hypotheses are as follows:

H1: There is no significant difference among the Cambodian on their perceived

influences of national culture and TQM principles on QM for themselves.

H2: There is no significant difference among the Cambodian on their perceived

influences of national culture and TQM principles on QM among the Foreigners.

1.2.2. Research scope

In the context of this study, the respondents are both from foreigner-owned and locally owned Cambodian firms. Respondents are Cambodian who have worked experiences with foreigners in construction field in Cambodia.

In this research, the target respondents are selected from construction, consultant, architect firms include the following:

- Foreigner-owned firms which have worked in Cambodia and employed Cambodian as their staffs (work as engineer, architect, project manager, site manager, site engineer, consultant etc.).
- Locally owned Cambodian firms, all size enterprises which have been worked with foreign firms.

1.3. Summary of The Study

This book has six chapters.

Chapter 1 (this chapter) provides the research problems and knowledge gap which link to discuss the objectives and aim of research. The objectives and aim of research describe the study purpose, research hypothesis and research scope.

Chapter 2 provides literature review on TQM and National culture. It includes quality management, TQM, ISO 9000, National cultural dimension, and adopted Hofstede's cultural dimension for Cambodia. In addition, the relationship of national culture and the TQM also discussed which provides it conflicts, effects of the culture on the TQM implementation. Furthermore, some case studies in China, Japan, and ASEAN

countries are presented which provided some experiences, history, method, and effectiveness of applying TQM in construction sector.

Chapter 3 presents the construction industry in Cambodia. It provides overview (geographic, climate...), socioeconomic developments, some historical developments to now, and key driver for investment SWOT (strength, weakness, opportunity, and threat) of construction sector in Cambodia.

Chapter 4 is mainly focused on style and research design. It discusses the procedure of study for collecting data (accessibility, important data, type of data, source to access) to test the hypothesis. Various research design and methods, sampling frame, and study elements are reviewed which is a key to reach the research objectives.

Chapter 5 presents the results findings of the input data from survey, and hypotheses checking for the research. It confers the respondent's characteristics, importance of TQM and national culture, and interpretation by using a statistical testing.

Chapter 6 reviews summary results of the study, provides some recommendations to the both foreigners and Cambodian, limitation of the study, and conclusion.

2. LITERATURE REVIEW ON NCDS AND TQM

2.1. Multinational Construction

Stebblings (1998) defined the multinational construction plans as the jobs in which the project team members (contractor, sub-contractor, consultant, and specialist workers) are totally from different domicile and more than one of team members are working out of their own country or abroad.

In terms of inter-sectoral linkages, according to Riedel and Schultz (1978), the construction sector is considered as the forth rank of the economic area and plays a role to the economy of a country has been taken as forward and backward linkage. Chan (2001) considered the construction industry role to the economy of a nation has been interpreted as bidirectional causal relationships and as layers of benefits, respectively.

Multinational construction firms, particularly in developing countries and the Middle East, have facing serious problems managing and carrying out their assignments (Dadfar and Gustavsson, 1992). Multinational construction plans have great intensities of threat and complication, which lead to reach a higher probability of overrun and engagement than local projects (Zhi, 1995; Han et al., 2008). Consequently, risks in multinational construction are impressed by international and overseas nation situations and relative project aspects (Eyμποosh et al., 2011), by stories about sociocultural mishaps that had resulted from conflicts, misinterpretations, and frustrations (Dadfar and Gustavsson, 1992).

2.2. Quality Management Systems (QMs)

2.2.1. ISO 9000

Quality is defined as “the entirety of appearances and features of a service or goods which belong to its capacity to reach a specified need” (ISO 8402, 1986). Many researchers defined quality as “suitability for usage” (Juran and Gryna, 1988), as “conformance to necessity” (Crosby, 1979), as “the grade of conformance to a norm” by Japanese companies, and as “the planned aims that are concentrated towards customer’s favorites, enjoys, flavors, and claims” (Ishikawa and Loftus, 1990). Thus, the replying, providing the satisfaction of the customer’s need, requirement is the core feature in all these meanings (Ho, 1994).

ISO (International Organization for Standardization) commenced to improve standards to simplify, international trade, and by all of other things. ISO 9001 assigned the subsequent eight QM principles: (a) leadership; (b) continual improvement; (c) supplier relationships; (d) involvement of people; (e) process approach; (f) system approach to management; (g) factual approach to decision-making; and (h) customer focus.

2.2.2. TQM

TQM is defined in many definitions. Based on Tobin (1990), it is designated as the entirely combined power for achieving modest benefit by constantly improving all aspect of organizational culture, (Feigenbaum, 1991) it is the complete quality control's organization-wide effect. In addition, Witcher (1990) defined TQM by separating each word into definition; Total: everyone in the firms is involved, Quality: meeting exactly the customer's requirements, and Management: high-ranking managers are totally dedicated.

By Krygier (1993), TQM concepts is recently well recognized worldwide particularly in many countries such as the USA, Western Europe. Moreover, it is progressively applied in many developing nations for example Central and Eastern part of Europe countries and China.

2.2.3. ISO 9000 and TQM

Many researchers found that ISO 9000 could be a well step before beginning TQM (Kemp, 2006; Besterfield et al., 1995; Texeira-Quiros et al., 2010). Bradley (1994) also supported this when it is taken in a manner of boosting the firm to start on the progression of frequent development by collaboration of entirely individuals working in the firm. For instant, Goetsch and Davis (2010, p. 8) stated that the ISO 9000 principles were modified in 2000 to integrate with the TQM theories. The TQM and the ISO 9000 norms have maintained to be two columns to achieve and boost quality (Heras et al., 2002, p. 72), and have some mutual themes that could support ISO 9000 certified companies toward to be TQM firms (Martínez-Lorente and Martínez-Costa, 2004). However, because of the ISO 9000 set standards are much perfect, practicable, and uncomplicated than TQM principles, many companies have stated their quality journey by pursuing to the series of ISO 9000 if quality controlling standards (Van et al., 1997). According Symonds' (1996)

reports in 1995, there have been not less than 127,389 registrations worldwide and it was still increasing particularly in USA.

Venn diagram (Fig. 2.1) can be the best diagram to explain the differences and the similarities between the TQM and the ISO 9000 standards (Ho, 1994).

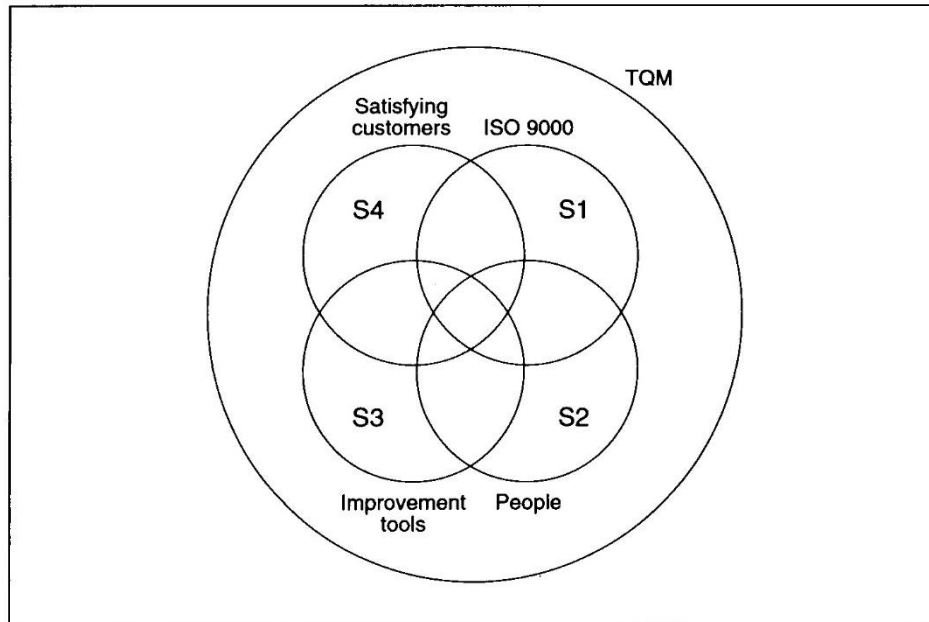


Figure 2.1. The Venn Diagram between the TQM and the ISO 9000

2.3. NCDs (National Culture Dimensions)

2.3.1. Culture

In the way of life term, culture is construed as the customs, aptitude, belief, manner of living and collective organization of a specific group or nation (Oxford Advanced Learner's Dictionary). It has been defined as several meaning. Based on Hofstede et al. (2010, p. 5), culture is a Latin origin word which stands for “civilization” or “mind refinement”. Hofstede considered this definition was a narrow sense and defined culture as *a software of mind*.

2.3.2. National cultural dimensions

Since 1980 the basic innovation of culture's consequences was categorizing national cultures into several dimensions. Hofstede et al. (2010, p. 40-44) introduced some well-known cultural dimensions which used the same paradigm such as Schwartz's,

GLOBE's, and the Dutch management consultant Fons Trompenaars. The four classifications of national cultures (include Hofstede's) are included the following:

- a) Hofstede's (1980) national cultural dimensions considered as a psychological framework. The detail of these dimensions will be described in the next section.
- b) Schwartz's (1994) dimensions is a widely known and elaborated application by an Israel psychologist Shalom H. Schwartz. His dimension is a seven nation-level dimensions which are conservatism, mastery, affective autonomy, egalitarian commitment, harmony, hierarchy, and intellectual autonomy.
- c) GLOBE project: Robert J. House who was a U.S. management academic perceived this framework in 1991. Based on the Hofstede's framework, GLOBE expanded it to nine cultural dimensions.
- d) The Dutch management consultant Fons Trompenaars's dimensions created by American sociologists founded on the theoretical differences in the 1950s and 1960s. These measurements are composed of seven dimensions.

2.3.2.1. Framework of Hofstede

The previous studies of Hofstede (1980) established into four dimensions such as (A) power distance, (B) individualism vs collectivism, (C) masculinity vs femininity, and (D) uncertainty avoidance. Later, the fifth of Hofstede's framework was added in 1991 called long vs short-term orientation for 23 nations, which grounded on the Chinese Value Survey (Ng and Lim, 2019). Due to little number of countries were provided the index scores, most researchers suggested using the initial Hofstede's (1980) dimension (for example Desender et al., 2011; Ng et al., 2007). In 2007, the fifth Hofstede's cultural dimension was revised by Misho Minkov. This fifth dimension based on the world value survey (LTO-WVS) which extended LTO index scores up to 93 countries in 2008 (Hofstede et al., 2010, p. 253). Misho's analysis found two WVS items in particular predicted that he considered as the Hofstede's sixth cultural dimensions called indulgence versus restraint (Hofstede et al., 2010, p. 280). However, Babatunde and Low, (2015, p. 18) advised that IVR be not be considered because it was reviewed as a relatively new dimension to the existing Hofstede's dimension. Moreover, IDV shares similarities with LTO and has not yet validated by other studies.

Hofstede et al. (2010) described their cultural dimensions as following:

1. Power distance (More equal than others): the degree of which the low influential affiliates of organizations or institutions (school, family, work place, center, foundation) inside a nation suppose and agree that influence is dispersed unevenly. PDI score show the dependences' relationship in a country between less powerful members (subordinates) and more powerful members (e.g. boss, parents, old people).
2. Individualism vs collectivism (I, We, and They): the degree of which the relations among individuals are unfastened for individualist societies or well tied among persons in groups for collectivist societies. People in the collectivist societies prefer to connect with other in their cluster or families that endure shielding them in give-and-take for faithfulness. In contact, people in individualist societies does not prefer to connect, get in touch with other in their cluster and prefer to take care by themselves.
3. Masculinity vs femininity (He, She, and S(he)): the sentimental difference of the gender acts in the social order. The roles of the sentimental gender in the masculinity societies are visibly diverse between men and women; men are hard, attentive, and self-confident while women are gentle, worried about the standard of living, and shy. However, roles of sentimental gender in feminist societies are overlap. Both men and women share the same emotion which assumed to be shy, gentle, and worried about the standard of living.
4. Uncertainty avoidance (differences is dangerous): the degree of which ambiguous or unknown situations cause the culture participants sense endangered. This sensation is stated over nervous feeling and a requirement of on paper or unprinted guidelines (for predictability).
5. Long vs short-term orientation (yesterday, now, or later): people in the long-term orientation societies tend to be persevered and thrift which symbolized the advancing of merits adapted to upcoming rewards. In contrast, people in the short-term orientation societies tend to be preserved of "face", respected for tradition, and fulfill social obligations which symbolized the advancing of merits connected to the earlier and present-day.
6. Indulgence versus restraint (Light or Dark?): a propensity to permit fairly free satisfaction of usual human wishes; for example, the living happily, having

amusement and fun. Happiness, importance of leisure, and life control were the survey items used for composing this new dimension by Misho.

2.3.2.2 Hofstede's cultural dimension in the work places

Table 2.1 summarizes some key differences of Hofstede's cultural dimension in the work places. There is no systematical different in effectiveness of small versus large power distance society because they might be good in their own tasks (Hofstede et al., 2010, p. 75). In collectivist society, Hofstede et al. (2010, p. 123) indicated that the good personal relationships are the prior condition before starting to do any task while the task is considered to be influent on any other personal relationships in the individualist society.

Internationally, according to Hofstede et al. (2010, p. 168). The masculinity or femininity society's culture have no relationship yet also the employment distribution of men over women. Both masculine and feminine society have advantages for different type of industries by their own way.

Table 2.1. *Cultural dimensions of Hofstede in the work place (Hofstede et al., 2010)*

Large PDI	Small PDI
- The feeling of inequality to each other between the seniors and juniors - Existentially bias is the root of ranked classification - Unified right is controlled by a few hands - Subordinates are not independent to do work; they expect to be told what to do - Workers are relatively low qualified - Big gaps of salary system - Contracts and privileges are entitled by superiors - Relationships between superiors and subordinates are depended on emotions. Good superior is the one whom subordinate feels comfortable with and respect most. - Older bosses are normally more appreciated than younger bosses	- The feeling of equality to each other between the seniors and juniors - Ranked classification is just in title role degree - Fairly decentralize with limited number of supervisory personnel. - Workers are highly qualified - Salary range of upper and lower works is not much different. - Good boss is a resourceful democrat - Subordinates can share their opinion, idea to improving their work, but they accept the final decision by superiors. - Younger bosses are normally more appreciated than older bosses

Table 2.1. (cont.) *Cultural dimensions of Hofstede in the work place (Hofstede et al., 2010)*

Individualism	Collectivism
- People frequently move from manual occupations to non-manual occupations. - People work focus on self-interest - Hiring process is not desirable to select relatives or family member due to it may provoke to an interest conflicts. - Employers and employee's relation is perceived as business deal. - Low conduct workers can be the reason for firing - Management is management of individuals	- People prefer to follow old operations, occupations. - People work for their group's interest rather than for their individual benefits - Hiring is mostly processed in the in-group. Relatives are the first option to hiring because they believe that it takes fewer risks. - Moral sense is seen in the relationship between employers and employees. - Low conduct workers are not the reason for firing - Management is management of groups - Discussing performance of a person openly should be avoiding because it is an unacceptable loss of face. - Truth is the important thing to have before any business can be done.
Masculinity	Femininity
- People think that a good fight could resolve conflicts "let the best man win" - Basis of equity is a value to stress results and reward achievement (reward to everyone according to their performance) - Their ethos of work is "live for working" - Money is more important than relax time - Boys are expected to aspire to career advancement with ambition, assertiveness, and competitions, while most of the girls do not want.	- Conflicts should be resolved by discussing, and compromising. - Reward achievement on the basis equality (to everyone according their need) - Their ethos of work is "work in order to live" - Relax time is more important than wealth - Career is optional for both men and women - A humanized job would provide more social contacts and manual help.

Table 2.1. (cont.) *Cultural dimensions of Hofstede in the work place (Hofstede et al., 2010)*

High Uncertainty Avoidance	Weak Uncertainty Avoidance
- Use many laws, regulations, and rules to prevent uncertainties - People tend to work hard, make them-self busy, time is money	- Regulations are not much importance if there is no totally requirement. - Problems could be solved by using informal rules - People feel low anxiety, more relax
Short Term Orientation	Long Term Orientation
- People need leisure time - Need short time profits (annual profits) - Workers and managers are not share the same aspiration	- People not much need leisure time - Need long time profits (ten years' profits) - People share the same aspiration

Masculine society has expertise in working in the production of heavy and big equipment manufacturing industries and bulk chemistry, particularly in big size (accomplish thing good, fast, and competently). However, feminine society is relatively good at providing service industries for example consulting and transportation (Hofstede et al., 2010, p. 169).

According to Hofstede et al. (2010, p. 209), high UAI culture makes people feel difficult to stay for long-term career or decide to suicide because of stress due to complicated rules, law, and regulation. Long and short term orientation different key in Table 2.1 is followed the China Value Survey (LTO-CVS) for business and thinking ways.

2.3.3. Five dimensions of Hofstede's culture in Cambodia

The cultural dimension of Hofstede's work is considered to be one of the most valuable models for telling culture among others (Berkvens, 2017). Responding to the objectives of the study as indicated in Section 1.4 (influence of cultural differences on quality management), the five cultural difference dimensions of Hofstede's was used as a framework to find out how the cultural differences effect on quality management in construction section in Cambodia. According to IBM research, national cultural score was giving to seven Asian countries such as Bangladesh, Malaysia, Indonesia,

Philippines, Singapore, Thailand, and Vietnam (Hofstede et al., 2010, p. 36). Unfortunately, Cambodian culture was not including in the Hofstede's work (1980, 1986) although this culture can be compared with other Asian countries (Berkvens, 2017). Berkvens (2017) stated that Thai culture is the most similar one than other Asian countries culture due to its culture standpoint and geography.

Based on Hofstede et al. (2010), Hofstede's culture values for each national culture dimensions for Thailand are presented in Table 2.2. Rank was the value comparing to other 76 countries and regions of the large amount of the World Value Survey (WVS) data base for the first four dimensions (PDI, IDV, MAS, and LTO), to other 93 countries base on the WVS data added using 2005-08 data (Hofstede et al., 2010, p. 257).

PDI of Hofstede's culture for Thailand was slightly high (64 points) with the same score to Africa E and Peru but lower than other Asian countries for example Malaysia (104 points), Philippines (94 points). This PDI index value presents that Thai culture respects to hierarchy and protocol and accept inequality (Berkvens, 2017). This PDI index also support to the Khmer characteristic. Nguyen (2010) stated that Cambodian are mostly showing their difference or respect to the elder and children has to accepted their parent's decision.

Table 2.2. Hofstede's Culture Index Value for Thailand (Hofstede et al., 2010)

Hofstede's Culture Index	Score	Rank	The same score with other countries
Power distance index (PDI)	64	34-36	Africa E, Peru
Individualism index (IDV)	20	58-63	Bangladesh, China, Singapore, Vietnam, Africa W
Masculinity index (MAS)	34	64	No
Uncertainty avoidance index (UAI)	64	45	No
Long term orientation index (LTO)	32	62	No

IDV index was found too low with only 20 points (the lowest than other Asian countries) that is represented that Thai is collectivist culture which the same as other Asian countries such as Bangladesh, Singapore, and Vietnam.

MAS index was found 34 points, which shown that Thailand has a feminist culture. This feminine pole provides conveniences such as good working relationship with direct superior, cooperate well with one another, good living environment, and security to work for long time in one place (Hofstede et al., 2010, p. 139).

UAI index score of Thai's culture was 64 points equal to PDI index score, which presents that Thai's culture was slightly high. Thai tries to avoid risk and is not readily to accept change, thus they adopted and implemented many strict rules, law, regulations, and policies to reduce uncertainty (Berkvens, 2017).

LTO index score was found in the low value (32 points), it was shown that the Thai's culture tends to short term orientation culture. Based on Hofstede et al. (2010, p. 238), it means that people prefer promoting virtues value to both earlier and present-day (yesterday, now) especially they admiration of avoiding losing face, following the requirements of their society, belief, and tradition.

2.3.4. Cambodian characteristic

Characteristic is all features and qualities that make a person, places, and groups of people different from others (Oxford Advance's Learner Dictionary), and considered to be more important than external appearance (physical) that is means character can describe what a person be like (Genevieve, 1984). Cambodian are mostly not much express their feeling, this because they are afraid of losing face. Both negative (anger, fear of being losing face, criticized, and sad) and positive feeling (pleasure, emotional feeling) are not much strongly shown (Genevieve, 1984). Good relationship is a key be doing business with them because friends, family are the best reliable person that they believe as a source of reliable information to work with (Genevieve, 1984), however getting such a good relation is not easy thus people have to be patient to build such relation (Berkvens, 2017). Harmer's (1995) research found that Cambodian is in collectivism context like other Asian countries such as Malaysia, Thailand, Bangladesh, Singapore, Vietnam and Indonesia.

Louise (1984), to correcting, advising, or complaining to an older, people with higher status, or person who are not close friends, people are mostly expressed their polite, respectful manner and soft voice to ordering or requesting something. This character presents that Cambodian is a power distance culture (PDI) with a relatively high by

considering to the Thai's PDI index score but lower than other Asian countries (Hofstede et al., 2010, p. 97). Harmer's (1995) work also indicated a power distance exist in the Cambodian society and larger than before civil war.

According to the Harmer's (1995) work show that 70% of respondents strongly respect traditional, and that 70% of them felt tight with stranger, unstructured or unpredictable situation. These results show that Cambodia culture has a high UAI index score. Cambodia could be compared as a feminine culture like Thailand although some masculine behavior can be identified (Berkvens, 2017). Following the Harmer's (1995) work, most of the respondents perceived Cambodia culture as short-term orientation. This result indicates that Cambodia is considered as short-term orientation culture as Thailand.

2.4. Conflicts in Multinational Construction

2.4.1. Cultural management in multinational construction

As stated in Mohammed et al. (2008) study, culture increasingly becoming important in multicultural construction due to the different cultures which is frequently product various disagreements. Mahammed et al. (2008) considered that the outlines of the culture in the broader society is reflected from the cultural patterns in the project environments.

According to Weatherley (2006) and others researchers agree that it is already not much easy to success in doing a project which the project crew is near to the construction project location but this condition will be greatly difficult for variety cultural groups. This complicity may be as a consequence of extensively divided geographically and also if there have divergent regional cultures and organizational. Ochieng's (2010) study found that the awareness of cultural variation of the project manager is an influence factor that can be made an effective contact in multinational construction.

2.4.2. Cultural misunderstandings in multinational construction

Multinational construction is composed by many parties which are from difference cultures. According to Latham (1994), the two main factors which producing foremost loss to the production are construction disputes and project procurement. Other researchers' work for example Ofori 1984; Turin (1972); and Aniekwu and Okpala (1988) also indicate alike problems are internationally known and especially these problems are

badly damaged to developing or fewer developed countries. Knowledge sharing in the multinational construction can be impacted by the national culture (Kivrak et al., 2014). Based on their analysis the critical obstacle to achieving knowledge sharing in the international projects teams are trust, motivation, language and communication difficulties, and personal relationships.

2.4.3. Culture and conflict relationship

The comparing the differences across diverse cultural group is most studies in the cross-cultural management (Kim et al., 2007). However, the internal rank of these strategies within each country should be informative to be investigated (Kim et al., 2007) and it is believed that these conflicts styles are not created equally (Rahim, 1992; Wilhelm et al., 1993).

Chan and Suen (2005) studied some characteristic of the conflicts appearing in the multicultural construction fields in China. The finding of their research (Chan and Suen's work) found that, in the concept of multicultural construction sector, contractual matter is the main problems issuing disputes, and then cultural and legal matter are also the main source of problems. Another scholar for example Howlett (2003) also supposed that disputes could derive from the conflict of jurisdictional problems and laws then these issues should not be ignored.

2.5. NC and TQM

2.5.1. Impact of NC on TQM application

According to an analysis from the previous studied (Grant et al., 1994; Burdett, 1994; Garvin, 1986) recommended that only 33% to 50% of the companies have seen to be significantly improved through the TQM agendas. This figure indicates that some companies still found their difficulty to implement the TQM even though it is popular now and this lack of signification because they were not much pay enough consideration to the differences of the structure and culture which could be impact on TQM application (Tata and Prasad, 1998).

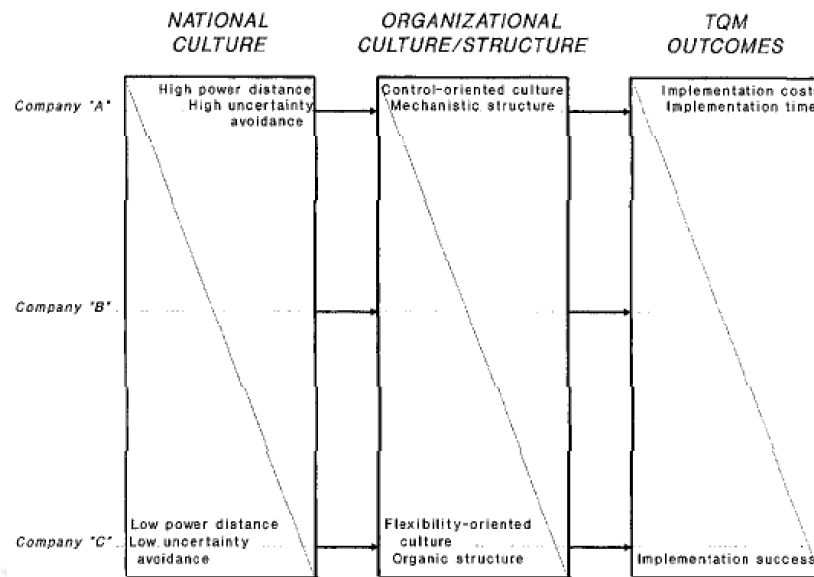


Figure 2.2. Impact of PDI and UAI on TQM application model (Tata and Prasad, 1998)

Tata and Prasad (1998) designed a model (Fig. 2.2) which show the impact of the culture of nation, culture of organization on the TQM application. Figure 2.2 shows the variation in the national culture influence on TQM outcomes (organizational culture/structure is not discussed here). According to Hofstede (1994, p. 140), two Hofstede's cultural dimensions (PDI and UAI) have straight relations to control-flexibility value-orientations and to mechanical-organic structure. Different ranks of PDI and UAI of each company are likely to have different outcome. This model indicates that high PDI (e.g. Hong Kong, the Philippines, Singapore) and UAI (e.g. Greece, Portugal, Belgium, Japan) scored countries are not easy to implementing the TQM because it costs and less success. In contrast, nations that have small PDI (for example Austria, Denmark, Sweden) and UAI (e.g. Singapore, Hong Kong, the Philippines) scored are more likely to get success results and cost less for implementing the TQM.

2.5.2. NC and TQM application

Consequently, the less of paying consideration to the variables of the structure and culture is the main barrier to implementing TQM successfully (Tata and Prasad, 1998). There are several distinct between the liaison of corporate culture and the dimensions of the TQM application in each region, thus different regions should be considered in order to applying the TQM application (Sousa-Poza, 2001; Ngowi, 2000).

Texeira-Quirós et al. (2010) suggest that companies have needed to adopting the NQAs (National Quality Awards) which it can boot their competitive degree for continuity and position of strategic market as a result of the worldwide needs. According to Hendricks and Singhal (2000), NQAs serve a NQAs work as substitutions to culture sensitive of TQM application which indicated that overseas firms from different cultures require an appropriate TQM to be adopted. NQAs were found a hundreds in diverse nations, some best well-known NQAs are DP is used in Japan, MBNQA is used in USA, and EQA is used in European regions (Bu et al.,2012).

2.5.3. TQM application in practice

As of the earlier descriptions, many studies show that the implementation of the TQM is influenced by different countries. As a consequence, the national culture must be considered to minimize conflicts of the implementation of TQM. In order to get ideal profits to all parties (the marketplace where they maneuver and implicating companies), it is necessary to consider the NQAs and other relevant enterprises as potential solutions to reach a successful implementing of TQM. Some case studies related to the TQM implementation (history if TQM implementation, conflicts, and obstacles) of some countries such as China, Japan, and ASEAN countries as the following sections.

2.5.3.1. China

Zhao et al. (1995) research found that, while the TQM was implemented by many Chinese manufacturing companies since 1978, numerous Chinese manufacturing firms are still commonly adopted some elemental modern systems of quality managing methods and principles of quality, even there has been great efforts of the Chinese government to motivate companies to apply TQM and quality of product (Zhihai et al., 2000).

Li et al. (2003) by considering the role and practices of total quality management in China, found that the implementation of TQM is highly variable. As consequence, the degree of implementation of TQM is shown how the positively impact of TQM on firm performance (Yusuf et al., 2007). Li et al.'s (2003) research showed that joint-venture, private own, and state owned enterprises scored highly, well, and poor in quality practice respectively. According to the results, he concluded that the poor performance of the TQM implementation of state owned enterprises can be caused of the demand economy for creating the attitude and structure.

2.5.3.2. Japan

The TQM is originated in Japan in early 1960s, and it had found and develop strongly effective because this application can push up the human resources ability which is funding to improve industries and country economy (Onitsuka, 1999). Many researchers such as Miyagawa and Yoshida (2010); Yoshida (1989) asserted that the TQM implementation is used by many Japanese manufacturers as an important and energetic commercial policy to advance their competitive places in the open market. The orderliness and cleanness are well-known in Japanese culture. Following this manner, in order to achieve great service wants and quality yields, the management style called 5-S is adopted in the place of work. According to the questionnaire survey of Ho et al. (1995), the 5-S play an important role for success TQM implementing which provides essential total quality environment.

In 2007, An empirical study was conducted on Japanese-owned company in USA by Miyagawa and Yoshida. The results of their study and other of a field research revealed that the Japanese-owned firms which operate in the United States were knowingly impacted by the implementing of TQM i.e., regardless of where the firm would be operated, the well implemented TQM system is a great technique to boosting the achievement of business (Miyagawa and Yoshida, 2010).

2.5.3.2. ASEAN countries

In 1967, a regional organization was founded in Bangkok city, Thailand which named “Association of South-East Asia Nations”. The purposes of creating ASEAN were to speed up growth of economy, to stimulate stability and security in the whole area, and to improve culture and community procedure. This organization collected 10 countries as memberships which are Brunei Darussalam, Indonesia, Cambodia, Lao PDR, Malaysia, Myanmar, Thailand, Philippines, Singapore, and Vietnam. According to Karki et al. (2005), this region is being known as the one with the most potential for development and growth and the one of the powerful areas for its human resources, and high economic growth in the world.

Regarding the TQM implementation process, managing of quality in Thai industry is known as a new notion, however the progress of implementing has seen as an extreme acceleration in some last years. Krasachol et al.’s (1998) work found that the TQM implementation in Thailand had made relatively little progress of Thai-owned firms

(some big Thai-owned companies are excepted), but was mainly focused on foreign-owned firms in the electronics field.

2.6. Summary

The chapter presents the literature review on the TQM and national culture which described mainly on quality (TQM, ISO 9000), culture, conflicts, and TQM implementation. It revealed that the ISO 9000 is the subsequent step to pursue TQM in quality journey. Some national cultural dimensions are presented particularly Hofstede's dimension; which provides the Cambodian cultural score index by following the Thai Hofstede's cultural score index. However, to implementing a successful TQM, it is necessity to adopt the national culture and others forms of culture in any regions for example the National Quality Awards (NQAs). While the NC is considered, conflicts in TQM operation could be minimized. In the end of this chapter, some case studies of TQM implementation in China, Japan, and ASEAN countries are presented.

3. CONSTRUCTION INDUSTRY IN CAMBODIA

3.1. Overview of Cambodia

Cambodia was known as the Khmer Empire which is located in Indochina region or in South-East Asia. It shares border with Thailand, Lao, and Vietnam (Fig. 3.1). Cambodia's surface area is 181,035 km² which divided into 25 province-city. Phnom Penh is the capital city of Cambodia; the center of economic, art, culture, politic, the heart of Cambodia within the inhabitants of 1.4 million.



Figure 3.1. Cambodia map (<http-2>)

Table 3.1 represents some information of Cambodia. According to World Bank's 2017 data, Cambodia's population is 16,005.373; which 48.81% male and 51.19% female and density 91.05 p/km². Its GNI per capita (current US\$) is 1230\$ and GDP 22.158\$ billion dollars. The annual GDP Growth is equal to 6.8% in 2019 and is forecast equal to 6.8% in 2020 and 6.7% in 2021.

Table 3.1. *About Cambodia (http-1)*

Formal name	The Kingdom of Cambodia
Type of administration	Constitutional Monarchy
Population	16.5 million
Area	181,035 Km ²
Capital city	Phnom Penh
Time Zone	Indochina Time GTM+7
Currency	Riel (KHR)
GDP growth rate	6.8% (2017), 7.0% (2016), 7.0 % (2015), 7.1% (2014), 7.4% (2013)
FDI	(USD billion) 2.29 (2016), 1.70 (2015), 1.72 (2014), 1.87 (2013), 1.84 (2012)
Global competitiveness	rank 94/137 (2017/2018)
Doing business comfort	rank 131/190 (2018)

Bordering countries Thailand and Vietnam are the huge neighbor countries which have a strong relation since the past. Relationship between Cambodia and China has been for long, they celebrate the 60th anniversary diplomatic ties in 2018. Cambodia has a strong link to and is regarded as the China's strongest ally in the region (http-7). Next, the USA is a huge country that provides a huge economic importance to Cambodia by importing goods. Then, Japan is the biggest donor country to Cambodia in the development assistance sector. Moreover, Cambodia has diplomatic ties with many countries such as Japan, USA, China, some European countries, Korean (both South and North), and many international organizations such as ILO, WTO, WB, UN, ASEAN, ADB, AIIB, and IMF.

3.1.2. Demographic

The demographics of Cambodia are strongly impacted by the colonization, domestic battle and genocide regime. Under the France rule, some economic rule took place, buildings, road, railways were construction but Cambodian need to pay heavy taxes. After declared the fully independence in 1953 from France colonial (almost a century), country was led by Norodom Sihanouk. In 1970, a new era started (Called Khmer Republic) after the national Assembly removed Sihanouk as the "Chief of State".

This regime was led by Lon Nol under the supported from USA. The Americans bombed Cambodia to try to stop the communists. However, the communists were increasingly strong and finally controlled Phnom Penh on 17 April 1975. Three year eight months twenty day was the horrific and tragic period of Cambodian history. This regime was called “Cambodia Democratic”; the reign of Khmer Rouge. It was led by Pol Pot (real name Saloth Sar). They evacuated people from city to work in field, eliminated money and religion, forced people to work, banned private property and formed collective farm. During this regime, probably at least 1.5 million to 3 million were killed by Pol Pot. This regime was ended in 07 January 1979 by the War with Vietnam. Until 1991, the negotiation from all parties was held in Paris, France. As a result, the Paris Peace Accord 1991 then Cambodia abandoned communism, elections were held beneath the control of the authority of and the constitutional was framed as Monarchy Constitutional.

Today Cambodia has official name “Kingdom of Cambodia”, set up as a multi-party democracy under a constitutional monarchy and King Norodom Sihamoni crowned since 2004 after his father Norodom Sihanouk abdicated. Theravada Buddhism is the religion of the state as indicated in the constitution article 43rd. There are more than 95 percent among the inhabitants following the Theravada Buddhism, and about 4,400 monastery pagodas in the entire country. Minorities such as Malay and Chams in the country are mainly followed Islam which about 4%, while most Muslims are Sunnis. Christian also presents in Cambodia with about 1%. Khmer is the most ethnic in Cambodia which currently 97.6%. Other minority ethnic breakdown of the population as predicted in 2013 is Cham 1.2%, Chinese 0.1%, Vietnamese 0.1%, and other races at 0.9% ([http-4](http://4)).

3.1.3. Climate and resources

Cambodia has a tropical climate-warm and humid and not affected by tropical storms. Southeast monsoon (rainy season) start from May to October which has most precipitation in the months of August and September whereas the northeast monsoon runs from December to April which bring sunny and dry weather particularly in January and February (see Fig. 3.2).

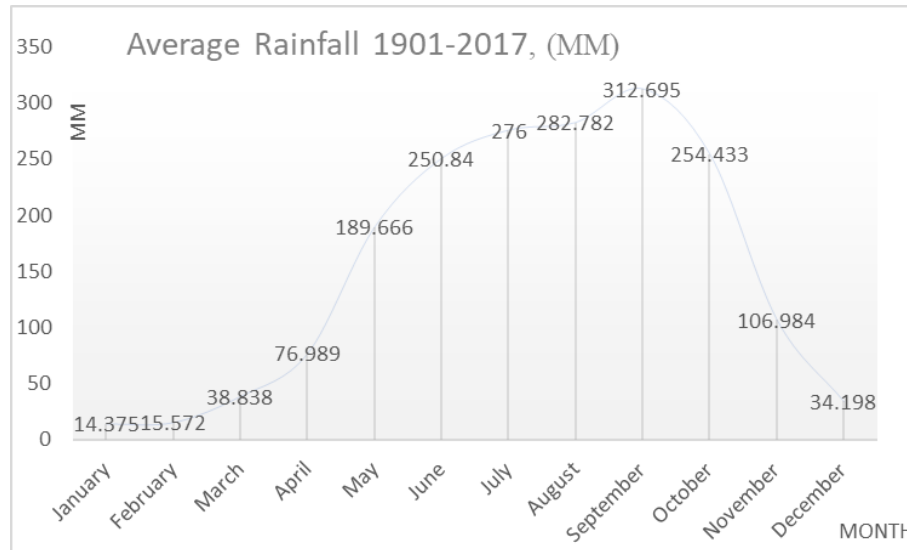


Figure 3.2. Average Rainfall 1901-2017 (mm) ([http-5](#))

According to the World Bank data, the average temperature is about 27 degrees Celsius. The minimum temperature is about 24 degrees Celsius in December and January whereas the hottest temperature is about 29 degrees Celsius in April (see Fig. 3.3).

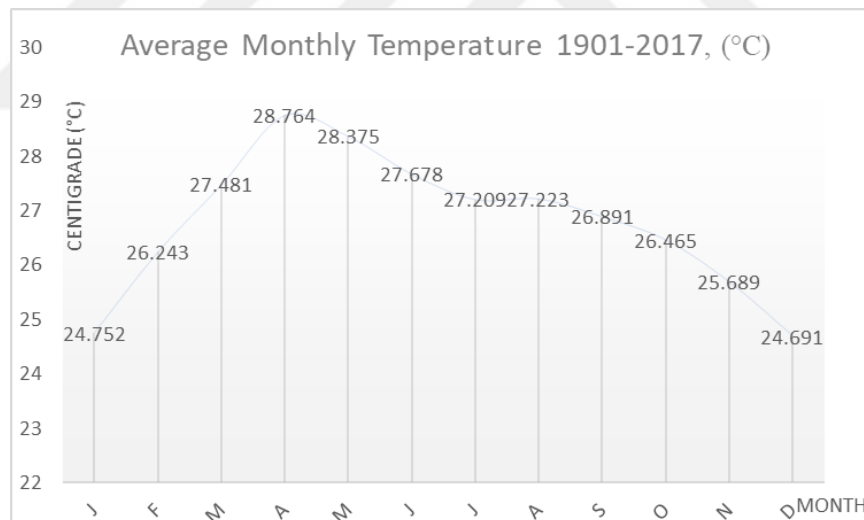


Figure 3.3. Average Monthly Temperature 1901-2017, (°C) ([http-5](#))

Cambodia is rich of natural resource including forests, waterways, plants and wildlife, mineral, energy, and extractive. Agricultural, forest products and fisheries are the main resource which just under two-thirds of Cambodian population depends on for their livelihood ([http-11](#)). Those extractive industries consist of the mining and mineral sectors, natural gas and oil, petroleum, and refineries and quarrying for construction resources such as gravel, sand, and stone. Oil exploration territory is divided into ten

offshore blocks (A to F and Area 01 to 04), nineteen onshore blocks (VIII to XXVI), plus an overlapping claims area (OCA) contested with Thailand, all administered by CNPA (Cambodian National Petroleum Authority) ([http-6](#)).

3.2. The Progress of Cambodia's Construction Sector

3.2.1. Overview

According to Anaman and Osei-Amponsah (2007), the construction industry is defined as a formation of a group of companies with similar activities involved in the construction of physical and social needs, including buildings, bridges, public and private infrastructure, as well as production of shelters and consumer goods. It is regarded as a foremost dynamic field not only in developing nations but also in developed nations in the term of output and employment (Durdyev and Ismail, 2012).

Construction industry in Cambodia is considered as a core pillar in the overall economy of any country because of its strong relations with other sectors (Lewis, 2004). Cambodia is a developing country which the construction industry output has a positive relationship with the economic growth (Turin, 1969). In recent years, the economic growth rate (a two-digit rate) has triggered an economic boom, with many new project both local and foreign investments such as hotel, restaurant, bar, supermarket, residential building, apartment, trade center building, factory, infrastructure, and hospital spring up rapidly around the city. Most construction projects are in Phnom Penh city, Kandal province, and Sihanouk province and Siem Reap province. Cambodia is still a target country for foreign person investors to invest in real estate with a 6-8% ROI annual rate ([http-9](#)).

Construction sector in Cambodia is creating a progressive role to the total growth rate of economy. In one-year period (2016-2017) GDP from the construction in Cambodia topped up about 669.9 KHR Billion (see Fig. 3.4 for more detailed). According to NBC (National Bank of Cambodia), in the semi-annual reports (2018) indicated that this sector was contributing 11.5% of the Cambodia's economic. While the construction and real estate sectors are increasing, the loan portfolios for these field also greater than before.

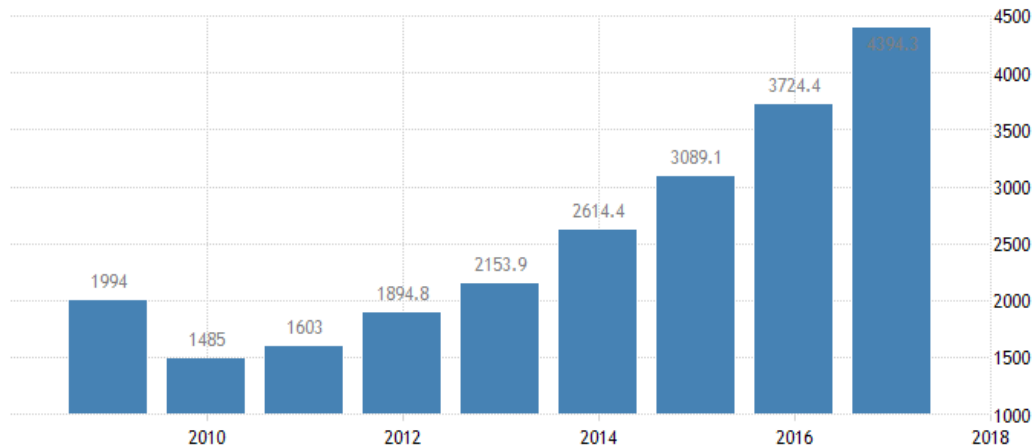


Figure 3.4. GDP history from construction in Cambodia ([http-10](#))

According to Matei and Băieşiu (2014), the present public administration action in Cambodia is poor, inefficiently, and cost-ineffective performance. For instance, the late of the construction permits process; it proceeds almost two years to get all the construction permits necessary to finish a job in Cambodia, while it takes only 200 and 150 days in Vietnam and Thailand, respectively.

3.2.2. Main actors in construction sector of Cambodia

As stated in the previous section, after peace treaties in 1991, Cambodia has received major international funding for its improvement and after war restoration work. As a result, Cambodia has received many aids from many donor countries/ organizations such as Japan, ADB (the Asia Development Bank), the World Bank, the USA, and China which contained within direct support, loans for development and aid for infrastructure from two-sided, many-sided, and private contributors. China, Japan, South Korea are the big players in construction and real estate sectors in Cambodia ([http-8](#)).

There are about 70 percent of Cambodian roads have been funded by China and often constructed by Chinese firms ([http-12](#)). For instance, Ministry of Information 22 March 2019, the first four lane expressway in Cambodia is being constructed on the build-operate-transfer has an estimated budget of US\$1.9 billion is constructing by China Road and Bridge Corporation (CRBC) ([http-3](#)). China have related many other mega projects such as the state-owned Phnom Penh Autonomous Port (PPAP) a \$28 million container terminal financed, a new airport on 700 hectares of land in Siem Reap of a 55 years BOT concession ([http-13](#)), six dams cost more than US\$1.6 Billion.

Japan has participated in many government projects by its agency called JICA (Japan International Cooperation Agency), its support is advancing in infrastructure projects covering bridge, road, channel, electricity arrangement and ICT technology progress. In addition, local conglomerates also play a role important in the construction industry sectors in Cambodia such as OCIC (Oversea Cambodian Investment Corporation). In February 2019, the second airport for Phnom Penh with an estimated about US\$1.5 Billion will be constructed by a joint-venture between a local conglomerate Overseas Cambodian Investment Corporation and the government's State Secretariat of Civil Aviation.

3.3. Doing Business in Construction Sector in Cambodia

3.3.1. Cambodia's market and considerations for the future

Cambodia's economy has seen rapidly grow since the economic system transformation from a planned economy to its present market-drive system (Chheang, 2008). Cambodia is the tenth member of the ASEAN union which including ten Southeast Asian countries with \$2.555 trillion economy and with over 638 million inhabitants makes one of the biggest fifth markets in the World run after USA, EU, China, and Japan. However, the economy of Cambodia shares only \$20 Billion in 2016 on this union, which is relatively small but bigger than Lao (\$15.9 Billion) and Brunei (\$11.4) (http-15).

On December 31st, 2015 Cambodia with all other ASEAN member, has become part of the AEC. The community aims to consolidate the economic integration of the region through only one market strategy which allows all services, goods, expert employment, and investment freely flow in the whole region. (http-16). However, to ensure that the country can stand and compete with other countries in the region, Cambodia has to improve some critical things such as further education and skills training of the workforce, and sustainable development (http-9).

3.3.2. SWOT of the Cambodia's construction industry

The SWOT (strengths, weaknesses, opportunities, and threats) analysis is defined as one of the most appropriate approaches to formulation which is a significant tool for strategically auditing the overall position of a business environment (http-14). Durdyev et al. (2016) have analyzed the SWOT of the construction sector in Cambodia post the

AEC integration. Ouk (2014) analyzed the key decisions and actions in the construction sector in Cambodia. Their study provided some statements that are believed to be most effectively supporting the SWOT in the construction sectors in Cambodia as shown in Table 3.2.

Table 3.2. *The SWOT of Cambodia's Construction Industry; Source: Durdiev et al. (2016), Ouk (2014).*

Strengths - Low-paid labor force in the region - Consistent growth in GDP in last decade - Promote monetary and regulatory motivations for FDI - Driving demand for infrastructure due to robust tourist to Cambodia	Weaknesses - Poor existing infrastructure - Excessive red tape - Systems of managing monetary and rule are low - Shortage of skilled workforce - Law and rules of construction work are limited
Opportunities - Geographical location - Demand for foreign expertise due to lack of local expertise - Room for infrastructure improvement - Weak existing infrastructure provides a great occasion to invest, for example rail-way and road construction investment. - Boosting demand for transportation due to increasing tourists.	Threats - High dependency on non-ASEAN foreign construction investors (Chinese and South Korean) - Foreign debt may be increased twice - Lacking of infrastructure cause much risks transportation cost and time. - Lack of domestic construction materials causes discharging cash to others countries

3.4. Summary

The chapter reviewed the Cambodia and its construction sectors. It found that Cambodia recently has seen a high economic growth as average 7%. Legal system of this country is close to France civil system because it was controlled by France for a century. Cambodia is a member of many organizations/unions such as ASEAN, UN, WB, IMF, ILO, WTO, AEC, ADB, AIIB, Francophonie, and Mekong Cooperation. Construction industry of Cambodia is considered as a powerful sector contribute to Cambodia's

economy, for example just a semi-annual of 2018 it was contributing 11.5% of the country's economy. However, this sector is mainly dependent on China, South Korean, and most construction materials are imported.

For the SWOT on Cambodia's construction industry reviewed, the strength includes cheap labor force, consistent of GDP growth, financial and regulatory incentive toward FDI, and high demand of infrastructure. The weakness includes poor existing infrastructure, lack of financial and regulatory system, lack of skilled workforce, and lack of construction law and regulations. The opportunity includes good geographical, demand for international, room for infrastructure improvement, high occasions to success, especially in infrastructure work (highway, road, rail-way), and boosting demand for transportation. And finally, the threat includes high dependency on non-ASEAN foreign construction investors (Chinese and South Korean) which could be increased twice of debt, lacking of infrastructure cause much risks transportation cost and time, lack of domestic construction materials causes discharging cash to others counties.

4. RESEARCH CONSTRUCT

This chapter provides the research method, method for collecting data, and method of data analysis. According to the research objectives as stated earlier, this study adapted both quantitative and qualitative approaches. Data collection was done by using the survey questionnaires that followed a questionnaires model designed by Babatunde and Low (2015). During the survey process, the survey questionnaires were given by hand to the respondents and face-to-face interviews were conducted if applicable.

4.1. Research Design

It should be the most important thing that a researcher makes is choosing an appropriate research design after identifying the research topic and formulating questions (Abutabenjeh and Jaradat, 2018). Research design is a way which researchers have to determine the methodological approach to solving the questions to the research problems (Fellows and Liu, 2008, p. 83). In this case study, a simple survey questionnaires form to collect data on the Cambodian construction practitioners (their observed to themselves and to foreigners of the impacts of NCDs and TQM on controlling quality) who have worked with foreigners was carried out. The survey questionnaires were designed to ensure that collected data are useful and hypotheses are tested.

4.1.1. Common research design

Bell (2014) proposed many research types such as Action research, Ethnographic research, Surveys, Experimental and Case Study. Those types are described in brief (Fellows and Liu, 2008, p. 21-24):

- Action research: the aims of this study are to recognize, stimulate, and estimate difficulties and possible solutions. Researchers need to be involved with active participant during the process study.
- Ethnographic research: this research has its root in anthropology, researchers have to submerge themselves in the part of group under study and observe subjunctive's behaviors.
- Survey: operate on basis statistical sampling. Generally, the samples are collected through survey questionnaire or interviews.

- Case studies: use as a deepness exploration of specific cases by the research question. Method of sampling is similar to survey research and might mix a variability of data collection techniques.
- Experiments: this research style generally execute in research laboratory to exam connections among hypothesis or determined variables.

4.1.2. Research design selecting

This study is selected research design as the following:

- Review of literature on the implementing of TQM in difference cultures of previous studies was adopted to fulfill the objective 1.
- To fulfill objectives 2 and 3, the survey research design was adopted. Survey was conducted to find independent feedback of the Cambodian construction practitioners who have worked with foreigners on their perceived significant influence of NCDs on TQM implementation.

4.1.3. Data collection method

The selection of data sort, source, place, and availability of this study is provided as following:

- (a) Main data were pursued from the Cambodian construction practitioners. It is identified through the related documents, and access on field (survey, interview) by contacting via their contact information (phone, email, and social media) to fulfill the requirement of objectives 2 and 3. Social media searching was mainly adopted because it is the most prefer contact for Cambodian.
- (b) Subordinate data were pursued from printed books, international papers to accomplish objective number 1. This data was retrieved from internet sites and public library. For instant, many journal papers were got from e-resources (internet).

4.2. Sampling

4.2.1. Type of Sampling

Marshall and Rossmann (2008, p.159) stated that the purpose of the sampling is to warranting that the model offers a worthy illustrate to the population. Moreover, to access the entire population the researchers want it may need time-consuming, costly or impracticable (Wagner et al., 2012, p. 86-93). According to them, sampling frame (list of all individual in the population) is required before sampling done. Once the sampling is done, the sampling size and method of sampling (probability or non-probability sampling) are respectively considered. Probability sampling is a method that individual sampling in the population has an identical and randomly choosing but non-probability sampling is non-random (Wagner et al., 2012).

Probability sampling is commonly preferred because the sample will present the population greater than the non-probability sampling does. However, when the selected individuals are not met the requirements, there is a biased sample (Stangor, 2011).

According to Wagner et al. (2012, p. 90-93), probability sampling methods are:

- Simple random sampling: for moderately small and homogeneous population.
- Systematic sampling: is assigned to as the sampling ratio and the resultant element is assigned to as the sampling interval.
- Stratified random sampling: sampling frame is divided into homogeneous group call strata or sub-population first, then simple are randomly selected from each strata.
- Cluster sampling: in contrast to stratified random sampling, these sub-group are heterogeneous.

Non-probability sampling is generally more economic and convenient, thus it is very useful in qualitative research (Huysamen, 1993). Non-probability sampling is divided in four as indicated below and there are also others types that are mostly used in the qualitative studies such as maximum variation, critical case, and theoretical sampling.

Non-probability sampling:

- Convenience sampling: sampling is collected with whoever is readily available, is say volunteer sample.

- Snowball sampling: is generally used when the participant of the population is difficult to contact. First, we have to contact a few individuals who are relevant to population then request them to identify or contact to others individual from the same population.
- Quota sampling: need to prepare many strata (sub-group) sufficiently signified in the sample confirming to their percentage in the population.
- Purposive sampling: the most useful type of non-probability sampling. This method is basely depended on the experiences, previous study of the researchers if they believe that such the participants can representative of the population.

4.2.2. Selected sampling

Aimed at objective number 1, the purposive sampling is used to demonstrate the related literature which focus on the impacts of NCDs and TQM on the quality management in construction sector was adopted. For objective 2 and 3, snowball sampling (non-probability sampling) was adopted to identify the Cambodian construction practitioners. Actually, the stratified sampling was conducted by dividing those relevant companies into group following their specialist (Consultant, contractor, sub-contractor, architecture, ...), then contacted them by email to those companies. However, this method did not work because there was a less response rate. Thus, snowball sampling was selected. It was stated from some identified participants (friends, senior, junior...) who work in the construction sector then ask them to identify or refer to similar people (their friends, colleges...).

4.3. Data collection method

At the early stage of a research project, researchers have to determine data requirements. It helps us to determine appropriate set of data which fulfill research objectives or test any hypothesis, provided the strength of study with good results which can be represented to the initial objectives. On the other hand, the restrictions of the data collection must be followed such as confidentiality, cost, time, ease of collection or provision etc. (Fellows and Liu, 2008, p. 147):

- Must be followed the variables of study
- Give some references of the effect of choosing data collection method.

4.3.1. Variable and measurement

Variables are defined into two types in the experimental research, namely: dependent variable and independent variable (Wagner et al., 2012). The independent variable consists of conditions that were used prior to detecting the dependent variable by the researcher (Gravette and Wallnau, 2008) when independent variable is used for defining the consequence of the independent variable.

Working in the different cultural condition is identified as impacting TQM implementation on quality management in construction sector as indicated in the literature review (mention to Chap. 2). Therefore, national culture and TQM are defined as independent and dependent variable, respectively. Moreover, the five dimensions of the NCDs and the eight principles of TQM are called sub-variable.

According to Wagner et al., (2012, p. 74) the major difference between social science and nature science is the nature of the variables and the measurement. Measurement is a method which an event or phenomenon are assigned by number. To define and categorized the variable, the level measurement is used. The level measurement helps us to interpret the data and to choose which statistical analysis method should be the most appropriate for analyzing variables (Trochim, 2006). There are four levels of measurement, specifically: nominal, ordinal, scale, and ratio. The ordinal scale is applied in this research survey questionnaires for all sub-variables and variables.

4.3.2. Method of data collection

May (2011) provides several types of methods of social research such as social survey, interviewing, participant observation, documentary research, case study, and comparative research. Those methods are explained in brief as below (May, 2011):

- Social Survey: It need a measure fact, or performance over inquiries. Thus, to support the respondents clearly comprehend, it is necessary to convert the research hypotheses in to simple questions.
- Interviewing: This method need maintaining and generating conversations between researchers and respondents on a specific topic or rang of topic. In order to accomplish a great outcome social researchers, need to understand the dynamics of interviewing.

- Participant observation: Its origin might be sought in social anthropology. This method is widely used on some specific area such as crime and deviance, race relations and urbanism.
- Documentary research: Historical documents (secondary data) are the source of this method. These documents help us to analyze, compare between the observer's interpretations of events and those documents. This method can tell us how those events are constructed, the reasons employed, and materials for the further research.
- Case study: This method provides the status, validity, and applicability as tools to better understand the social world take their inspiration from different philosophical tradition.
- Comparative research: is categorized by a diversity methodology, involved on matching nations, systems, method, groups, behavior, cultures, and people.

4.3.3. Selected data collection method

The selected method in this work are described below:

- For the objective 1, documentary research was selected to fulfill the acknowledged gap of study, supporting information. Altheide (1996), documents can be conceived of as symbolic representations of events. It can be said that document analysis is an analysis method in order to obtain facts (Pershing, 2002).
- For the objectives 2 and 3, survey questionnaires were used. The survey questionnaires form was followed the previous survey questions form prepared by Babatunde and Low (2015). Please refer to Appendices H for the survey questionnaire package used in this study, and Section 4.4. (*survey questionnaires*) for more details.

4.4. Survey Questionnaires

Survey questionnaires were designed to fulfill the aim of this study (objectives 2 and 3) of investigation the influence of TQM (dependent variable) and National Culture (independent variable) on quality management among the Cambodians as mentioned in the previous section. The different questionnaires integrate these variables and its sub-

variables (attributes of each TQM and NCDs principles) used, will be explained in the next section.

In order to achieve the optimum response rate, survey questionnaires were delivered direct to respondents in paper-based. According to Nulty (2008) internet based surveys cannot turn over many responses as the paper based surveys does if it has not used of numerous performs to boost them. Many other studies show that all of the paper based method are achieved more response rate than online survey (generally, online survey returns approximately 23 percent less than paper based survey), (Naire et al., 2005). In order to help the respondents easy to understand, the survey questionnaire was translated to Khmer language.

The survey questionnaire (refer to Appendix H) was separated into five parts (part A to E) as explained below:

Part A: This part pursued common info of the respondents (Bio-data) and company. Respondents were required to provide personal data such as age, the highest educational, oversea study, sex, occupation, title, duration of work experience in construction sector, and qualified membership. In addition, required information from relevant companies were company specialty, company size, and quality management system certificate. For privacy purpose, respondent's name, and company's name were not requested.

Part B1: This part pursued their observed importance of each attribute of Total Quality Management on themselves. By utilizing the 5-point inventive scale of Likert (Likert, 1932), the observed importance of each attributes were rated by the Cambodian responders.

Part B2: This part asked respondent to arrange their perceived on the eight principles of TQM from 1 (the most significantly to quality) to 8 (the least significantly to quality) on themselves. In addition to the attributes of the eight principles of TQM, the descriptions of each principle were provided for improving their understanding of each principle before deciding to position their views.

Part C1: Alike as part B1, this part pursued their observed importance of each attribute of National Culture on themselves. Again, utilizing the 5-point inventive scale of Likert (Likert, 1932), the observed importance of each attribute were rated by the Cambodian responders.

Part C2: Alike as part B2, this part asked respondent to arrange their perceived on the five dimensions of NCDs from 1 (the most significantly to quality) to 5 (the least significantly to quality) on themselves. In addition to the attributes of the eight principles of TQM, the descriptions of each dimension were provided for improving their understanding of each dimension before deciding to position their views.

Part D and E: This section pursued information from the Cambodian respondents on their observed importance of the NCDs and TQM principles on the foreigners who have worked in construction section in Cambodia. Respondents could provide their perception on foreigners who they have used to work with more than one nationality.

4.5. Summary

This chapter provides some technique in the research process covering the research designs, types of data, data selection method, data collection method, and data collection instruments. Primary data was used to investigate the importance of TQM regulations, NCDs, and also their elements that influence on managing quality in Cambodia as perceives by the Cambodian. Survey was conducted in Cambodia from December 2018 to January 2019 with CCPs who have been working with foreigners in construction industry sector. This study used snowball sampling (non-probability sampling) for collecting data. To fulfill the objective 1, documentary research was followed while objectives 2 and 3 adopted social survey research.

5. RESULTS AND DISCUSSIONS

This part demonstrates the outcomes of the data collection (survey questionnaire results), data analysis, statistical frequency, and a statistical (Friedman test).

5.1. Characteristics of Respondents

From the data collected (survey questionnaires), Appendix A provides the personal information of the Cambodian responders and also a small info of participated firms. Survey questionnaires were in paper based form, handed over to 26 construction firms. Then, representative respondents distributed questionnaires to each level of respondents (senior middle, and junior) in their respective firm. Within two weeks, all representative respondents were asked (by phone or chat via social media) if they had completed the survey questionnaires. In case it was not yet finished, we delay one week more to complete. A total of 84 questionnaires received out of 120 questionnaires sent to 26 firms. This number of reply can be considered a good result if comparing to the lowest response equal to 15 persons (Hofstede and Bond, 1998).

The 84 responses of the Cambodian responder were equal to 70 percent of the population which is bigger than the mean paper based reply rate (equal to 56 %) based on Naire et al., (2005). This was achieved due to good relationships between the researcher and representative respondents.

Table 5.1 and Table 5.2 presents the detailed information of the Cambodians such as: bio-data of respondents (sex, age group, highest academic, oversea education, professional, designation, and year of experiences) and firm's information (company specialty, and company size) respectively. Following Table 5.1, there were 10 females (about 12%) and 74 males, this indicate that there were 11 percent of women participated in this survey. Seven person were in age group 24&below, the same as age group 35-44 while seventy persons (83.3%) were in the age group 25-34. It is no doubt to say that their age group among respondents were uniform and young. Most of the respondents (86.9%) have bachelor degree as their highest education, and 15 respondents (17.9%) were used to study abroad. Fifteen respondents (17.9%) were used to study abroad, including nine respondents who have master degree (82% of master degree respondent used to study abroad). It shows that most of the respondents who have higher education level above bachelor's degree were used to study abroad. Seventy-two (85.7%) were civil engineer

as professional, sixty-eight (81%) were in the year of experiences in construction section group 1 to 5 among the Cambodians respondents.

Table 5.1. Bio-data of respondents (n=84)

Sex			
	Frequency	Percent	Collective Percent
Male	74	88.1	88.1
Female	10	11.9	100
Age group (years)			
	Frequency	Percent	Collective Percent
24&Below	7	8.3	8.3
25-34	70	83.3	91.7
35-44	7	8.3	100
Highest academic			
	Frequency	Percent	Collective Percent
Bachelor	73	86.9	86.9
Master	11	13.1	100
Oversea education			
	Frequency	Percent	Collective Percent
Yes	15	17.9	17.9
No	69	82.1	100
Professional			
	Frequency	Percent	Collective Percent
Civil Eng.	72	85.7	85.7
Architect	8	9.5	95.2
Electrical Eng.	1	1.2	96.4
Mechanical Eng.	2	2.4	98.8
Geotechnical Eng.	1	1.2	100
Position			
	Frequency	Percent	Collective Percent
Site Eng.	28	33.3	33.3
Structural Eng.	21	25	58.3
Architect	6	7.1	65.5
CAD Operator	10	11.9	77.4
Project Manager	3	3.6	81
Sale Engineer	2	2.4	83.3

Table 5.1. (continue) Bio-data of respondents (n=84)

Position			
	Frequency	Percent	Collective Percent
Site Manager	4	4.8	88.1
Technical Eng.	3	3.6	91.7
QA/QC/QS	7	8.3	100
Experiences in construction sector (years)			
	Frequency	Percent	Collective Percent
1 To 5	68	81	81
6 To 10	14	16.7	97.6
11 To 15	1	1.2	98.8
16 To 20	1	1.2	100

Table 5.2. Firm's information (26 firms)

Company specialty			
	Frequency	Percent	Cumulative Percent
Developer	8	30.8	30.8
Consultant	7	26.9	57.7
Main Contractor	8	30.8	88.5
Sub-Contractor	1	3.8	92.3
Others(Supplier)	2	7.7	100
Company size			
	Frequency	Percent	Cumulative Percent
Small	5	19.2	19.2
Medium	11	42.3	61.5
Big	10	38.5	100
Quality management			
	Frequency	Percent	Cumulative Percent
Yes	10	38.5	38.5
No	16	61.5	100

Analyzing with respect to Table 5.2, out of 26 firms, there were over three-quarter (88.5%) firms which include developers (8 firms), consultants (7 firms), and main-contractors (8 firms) respectively, and 11.5% involve sub-contractors and suppliers.

Five firms were small size while others eleven and ten firms were from medium and big firms, respectively. Only 10 firms (38.5%) were reported that it has certified quality management systems (QMSs), and those firms were mostly foreign firms.

5.2. Significant of TQM

Table 5.3 presents the results of the survey among Cambodians construction practitioners. This table presents the perceived significance of the principles of TQM to be reaching satisfying quality amid the Cambodian construction practitioners (i.e. the Cambodians to themselves and to the foreigners). These results are respected to the Sections B2 and D of the survey questionnaires among 84 respondents (for more detailed please refer to Appendix B). Relative ranks are determined through total ranks; which total ranks are the multiplicative results between significant rank (a) by frequency (b). Frequency based on the collected survey data results and significant rank is ranked from 1 to 8 (1 be most significant and 8 least significant). Thus, whichever QTM principle has the smallest total rank, that principle is the most significantly to be good quality perceived by respondents. Appendix B presents the summation of the total ranks and relative ranks for each of the QTM principles among the Cambodians respondents. A composite score is a statistical weight judges from a theory by expert which is originated from tests set weighting in linear arrangement (i.e., components) quantifying district paradigms to derive weights (Webb et al., 2006, p.91).

5.2.1. TQM principles rank

For themselves (n=84)

Based on the survey results (please see Table 5.3 and Appendix B for more detail), the respondents ranked leadership as the first, system approach as the second, customer focus as the third, people involvement as the fourth, process approach as the fifth, factual approach as the sixth, supplier relationship as the seventh, and continual improvement as the eighth, from the most to the least significantly to be achieving good quality. Almost a half (46.4%) of the Cambodian ranked leadership as the first important to reaching satisfying quality. System approach and customer focus are the second and third rank that is 1-3 rank significant by 67.9 and 44% among responders, respectively. The fourth and fifth rank are involvement of people and process approach. The significant rank 1-4 of this two principles are similar, 61.9 and 60.7%, respectively. The sixth and seventh rank

are process approach and factual approach. The significant rank 1-4 of this two principles is the same (17.9%). Conversely, the least significant ranking of the TQM principles is continual improvement that a half (43 person) of respondents ranked 7 and 8 significant rank by 51.2%.

For the foreigners (n=106)

The perceived importance of the principles of TQM between the Cambodians to foreigners (from most to least significant to be good quality) are leadership as the first, customer focus as the second, system approach as the third, process approach as the fourth, people involvement as the fifth, continual improvement as the sixth, factual approach as the seventh, and supplier relationship as the eighth (see Table 5.3 and Appendix B).

Table 5.3. TQM principles rank

TQM Principles	To themselves (84)		To the foreigners (106)	
	Total rank	Relative Rank	Total rank	Relative Rank
Customer Focus	336	3	369	2
Leadership	214	1	326	1
Involvement of People	337	4	483	5
Process Approach	341	5	426	4
System Approach	261	2	405	3
Continual Improvement	526	8	572	6
Factual Approach	494	6	586	7
Supplier Relationship	515	7	649	8

Leadership is ranked as the most significant to achieving to quality with ranked 1-2 significant is a half of respondents (50.9%). Next, customer focus, system approach, and process approach are ranked second, third, and fourth by similar 1-3 significant rank is equal to 50, 48.1, and 47.2% of respondents, respectively. Involvement of people principle is ranked as the fifth rank by 1-3 significant rank is equal to 30.2% only. The sixth and seventh rank are continual improvement and factual approach. The significant rank 1-4 of this two principles is the same (34.9%). Supplier relationship is the least significant of the Cambodians for foreigner by 7 and 8 significant rank by 50.9%.

5.2.2. Significant of TQM attributes

Table 5.4 demonstrates the outcomes from the part B2 of the investigation that provides the first important ranking perceived significant of each principle of TQM to be reaching satisfying quality amid the Cambodian (for themselves only).

Table 5.4. Importance of TQM attributes of the respondents

Rank	TQM Principles	First rank of TQM attributes
First	LEADERSHIP (1st)	Launching a strong idea for the forthcoming of the organization
Second	SYSTEM APPROACH TO MANAGEMENT	Giving the improved understanding of the roles and responsibilities required for succeeding common purposes and thereby decreasing cross-functional obstacle
Third	CUSTOMER FOCUS	Seeking and understanding customer's wants and prospects
Fourth	PEOPLE INVOLVEMENT	Individuals dynamically pursuing chances to improve their ability knowledge and experience
Fifth	FACTUAL APPROACH	Warranting that data and information are adequately precise and trustworthy
Sixth	PROCESS APPROACH	Evaluating and quantifying of the competence of main activities
Seventh	SUPPLIER RELATIONSHIP	Recognizing and choosing suppliers
Eighth	CONTINUAL IMPROVEMENT	Using a reliable organization varied method to continual upgrading of the organization's performance

The importance ranking of the attributes of TQM were figured by the mean rating which is the sum of the important rating scores rated among the Cambodian (Likert rating scale, 5 to 1 stands for strongly agree and strongly disagree as perceived to be reaching satisfying quality, respectively) and the frequency resulting from the numeral of responds to following score. By using IBM SPSS® software V25 (Statistical Package for Social Sciences), the detailed results (significant rating, frequency, standard deviation, and importance rating) of each TQM attributes are presented in Appendix C.

In Table 5.4, TQM principle's order was set according to the *relative rankings* among the Cambodians for themselves discussed in Section 5.3.1 (first ranked from *leadership* and finished with *continual improvement*). Then, all attributes were rated follow the *mean rating* for the Cambodians as derived from the frequency of their

perceived significance. According to Alwin and Krosnick (1985, p. 548), unlike the ranking, in addition to arranging the relative importance of value it can use for arranging the relative latent structure. In this study, the complementary approach has been adapted by arranging the principles of TQM as ranking and arranging the significant orders of their attributes as rating (see Appendix C and Table 5.4).

However, Babatunde and Low (2015, p. 130) advised to be noted that the total rank of the moderately low-ranked TQM principle necessity to be greater than other high-ranked principles due to the mean rating's summation under each TQM principles (also for NCDs will be discussed in next section) might derived composite score higher than the total rank. On the contrary, the order of the TQM principles have already predetermined by using ranking as shown in Table 5.3 while the rating is clarifying on the latent structure of the dissimilar attributes of each principle, as shown in Appendix C.

5.3. Significance of NCDs

Table 5.5 demonstrates the consequences of the survey among Cambodians construction practitioners. This table presents the perceived significance for the NCDs to be reaching satisfying quality amid the Cambodian construction practitioners (i.e. the Cambodians to themselves and to the foreigners). These results are respected to the Sections C2 and E of the survey questionnaires among 84 respondents (for more detailed please refer to Appendix B). Relative ranks are determined the same as for TMQ (please see Section 5.3). Appendix D presents the summation of the total ranks and relative ranks for each of the NCDs among the Cambodians respondents. The details of the important NCDs and their attributes will be discussed in the next sections

5.3.1. NCDs rank

Following results in Appendix D, responders ordered UAI and IDV as the greatest important to quality. The responders ordered UAI and IDV as greatest important to quality (i.e., number 1) equal to 25 and 24%, respectively. PDI was ranked in the third order, which about 20% of them ranked PDI as most significant to quality. 25% of them ranked LTO as greatest important to quality as UAI; though, around 40% ordered LTO as 4-5 important (less significant) to quality thus LTO was ranked in the fourth order. MAS is ranked as least significant to quality which 46% of respondents scored its significant ranked number five (i.e. the least significant to achieving good quality).

For Cambodian's perception of the NCDs among the foreigners, approximately 55% of survey response, 1-2 significant ranked IDV and UAI in place of the greatest important to quality among the foreigners. Approximately 25% of respondents ordered LTO in place of the greatest important to quality. For the last two dimension, respondents ranked MAS and PDI equal to 15 and 14% in place of the greatest important to quality (i.e. number 1), respectively among the foreigners.

Table 5.5. *NCDs principles rank*

NCD dimensions	For themselves (84)		For the foreigners (106)	
	Total Rank	Relative Rank	Total Rank	Relative Rank
Uncertainty avoidance	228	1	275	2
Individualism vs Collectivism	234	2	269	1
Power Distance	235	3	421	5
Long vs Short term orientation	237	4	293	3
Masculinity vs Femininity	326	5	332	4

5.3.2. Significant of NCD attributes

Table 5.6 offers the ranking of the attributes of each NCDs amid the Cambodians as pursued from the Section C1 of the survey forms in the Appendix H. Appendix E presents the analysis of the important ratings, mean ratings to each attribute of the NCDs between the respondents.

The first rating of the attributes of NCDs in Table 5.6 is followed their relative ranking between the Cambodians responders to themselves by respecting to Table 5.5 as shown in the previous section. Otherwise, the NCD attributes' rank follows mean ratings (the higher mean rating the higher significant be achieving) for the Cambodian as determined in Appendix E.

Following Table 5.6, the attribute of the UAI that the Cambodians ranked 1st to be achieving good quality is *hide their feelings without expressing out if it is positive or negative to others* with mean rating equals to 3.65. This rank is confirmed to the Hofstede's cultural score of Cambodia (refer to Section 2.3.3) which UAI equals to 64 points; the highest score than other dimensions. It indicates that the perception of the

Cambodian practitioners on UAI dimension is the same to their national culture; they try to avoid risk and are not readily to accept change.

Table 5.6. *NCDs attributes rank*

Rank of NCDs	NCDs	NCDs' attributes
First	UNCERTAINTY AVOIDANCE	Hide their feelings without expressing out if it is positive or negative to others
Second	INDIVIDUALISM Vs COLLECTIVISM	Emphasize respect to themselves and to others by evading blame among the group which causes lose face or shame. Certifying superiority, self-confidence, and optimistic
Third	POWER DISTANCE	Inspire participation of all parties in order to reducing the exclusive control of any person or a team for continue process
Fourth	LONG Vs SHORT TERM ORIENTATION	Admiration for situations such that a fact or condition related with an action is preserved or discussed
Fifth	MASCULINITY Vs FEMININITY	Demonstrate ambitious conviction, strong commitment to motivate to succeed

In IDV which they ordered 2nd, they rated *emphasize respect to themselves and to others by evading blame among the group which causes lose face or shame. Certifying superiority, self-confidence, and optimistic* with mean rating equals to 4.00. This finding respond to some previous study results on impacts of face on the multicultural work such as a study between the Chinese and the Nigerians by Babatunde and Low (2015), and between the Chinese and the Africans by Anedo (2012). In contrast, the Hofstede's cultural dimension score of Cambodia for IDV is equal to 20 points. It shows that Cambodian tend to be a collectivism culture. Thus, the perception of the Cambodian construction practitioners is not followed to their national culture score. They prefer moving from manual occupations to non-manual occupations and focus on self-interest.

Under the PDI that they ranked 3rd, they rated *inspire participation of all parties in order to reduce the exclusive control of any person or a team for continue process* with mean rating equals to 4.07. Hofstede's cultural dimension score of Cambodia for PDI is slightly high (64 points). Following to this national culture score on PDI and ranking of PDI, it may be concluded that Cambodian construction practitioners are slightly respected to hierarchy and protocol and accept inequality.

Under the LTO that they ranked 4th, they rated *admiration for situations such that a fact or condition related with an action is preserved or discussed* with mean rating

equals to 3.98. LTO score of the national culture is equal to 32 points. This shows that the perception of the Cambodian practitioners on LTO dimension is similar to their national culture. They prefer short-term orientation; they prefer promoting virtues value to both past and present (yesterday, now), leisure time, and short time profits.

The last one, under the MAS that they ranked 5th, they rated *demonstrate ambitious conviction, strong commitment to motivate to succeed* with mean rating equals to 4.05. MAS score of the national culture is equal to 34 points. This shows that the perception of the Cambodian practitioners on MAS dimension is similar to their national culture; they are in feminist culture. This is indicated that the Cambodian Practitioners are tended to work in order to live which provides conveniences such as working environment, good living environment, and longtime to work in one place.

5.4. Statistical Testing for Hypothesis

Following the survey results and Tan's (2011) framework, Friedman tests were selected as statistical test for hypotheses conforming to objectives number 2 and number 3 of this research. According to Demšar (2006, p. 11), the Friedman test is defined as a repeated-measurement ANOVA nonparametric equivalent test by measuring the average ranks of algorithms. Nachar (2008, p. 13) called this nonparametric tests as distribution free due to it used to label the situation in which the nature and the number of parameters are not much fixed and flexible in advance. In conclusion, the Friedman test is used to proof if different values of population are different by matching the difference of a population values median or mean weighed under dissimilar circumstances (Gwet, 2011). The formula of the Friedman (Fr) is defined as the following equation (Tan, 2011, p.110):

$$Fr = \frac{12}{nk(k+1)} \sum_{j=1}^k R_j^2 - 3.n.(k+1) \quad (8.1)$$

where:

n : signified the amount of responders, here amount refer to number of the Cambodians responders.

k : signified the amount of types or treatments, this study refers to number of principles of TQM and NCDs.

R_j : signified column sum of rank for any category j ($j = 1, 2, \dots, k$)

The different characteristics of hypotheses and the judgments on them are presented in Table 5.7. In this table, the Cambodians and the foreigners are designated with “C” and “F” for briefness, respectively. To make decisions if null hypotheses H_0 are accepted or rejected, the comparison between the significance of Fr (Friedman test in equation 8.1) and the critical value of Fr in the distribution table of chi-squared (χ^2) (two-tailed) with degree of freedom $v = k-1$ at the significance level 0.05 ($\alpha = 5\%$). Therefore, accept H_0 when $Fr < \chi^2$ and vice versa. The calculation detailed of the Friedman tests for TQM principle and NCDs among the Cambodians respondents (for self only) are offered in the Appendices F and G respectively.

Table 5.7. *Testing hypotheses results in Friedman tests*

Null hypotheses (H_0)	Alternative hypotheses (H_a)	Judgement
The observed impacts of the principles of TQM on QM between the Cambodian for themselves is not a considerable difference	The observed impacts of the principles of TQM on QM between the Cambodian for themselves is a considerable difference	Reject H_0 ($Fr = 197.476 > \chi^2 = 14.067$, for $p > 0.05$ adopting a two-tailed test)
The observed impacts of the principles of TQM on QM between the Cambodian for the foreigners is not a considerable difference	The observed impacts of the principles of TQM on QM between the Cambodian for the foreigners is a considerable difference	Reject H_0 ($Fr = 145.874 > \chi^2 = 14.067$, for $p > 0.05$ adopting a two-tailed test)
The observed impacts of the principles of NCDs on QM between the Cambodian for themselves is not a considerable difference	The observed impacts of the principles of NCDs on QM between the Cambodian for themselves is a considerable difference	Reject H_0 ($Fr = 32.810 > \chi^2 = 9.488$, for $p > 0.05$ adopting a two-tailed test)
The observed impacts of the principles of NCDs on QM between the Cambodian for the foreigners is not a considerable difference	The observed impacts of the principles of NCDs on QM between the Cambodian for the foreigners is a considerable difference	Reject H_0 ($Fr = 59.170 > \chi^2 = 9.488$, for $p > 0.05$ adopting a two-tailed test)

For the eight TQM principles, the critical value of the Fr in the chi-squared (χ^2) distribution table (two-tailed) with degree of freedom $v = 7$ at the significance level 0.05 ($\alpha = 5\%$) is 14.067. For the test of their observed impacts of the principles of TQM on managing quality for themselves and for the foreigners, Fr for equal to 197.476 and 145.874 respectively. Therefore, since Fr are totally bigger than the critical value

(14.067), H_0 are not accepted thus the alternative hypotheses will be accepted instead. Hence, assume that there is a considerable difference between the Cambodians on their observed influence of the principles of TQM on QM for themselves and for the foreigners as expressed in Table 5.7.

For the five NCDs, the critical value of the Fr in the chi-squared (χ^2) distribution table (two-tailed) with degree of freedom $v = 4$ at the significance level 0.05 ($\alpha = 5\%$) is 9.488.

For the test of their observed impacts of NCDs on managing quality to themselves and for the foreigners, Fr for equal to 32.810 and 59.170 respectively. The same as TQM principles, Fr are totally bigger than the critical value (9.488), H_0 are not accepted thus the alternative hypotheses are accepted instead. It can be assumed that there is a considerable difference between the Cambodians on their observed influence of the principles of TQM on QM for themselves and for the foreigners.

According to this statistical tests, the results totally support the hypothesis of the study (fulfill objectives 2 and 3) to confirm that there are differences in the observed impacts of principles of TQM and NCDs on managing quality within the Cambodians.

5.5. Summary

For the TQM principles, the respondents ranked *leadership* as the first rank (the most significantly to be achieving good quality) for both self and foreigners. On the other hand, the least significant principle to be achieving good quality was *continual improvement* for self and *supplier relationship* for foreigners. For the NCDs, the respondents ranked the most significant to be achieving good quality was UAI dimension for self and IDV for foreigners. However, the least significant to quality was MAS for self while PDI for foreigners. Comparing the ranking of NCDs of Cambodian Construction practitioners with Hofstede's cultural score for Cambodian found that four national culture dimensions for Cambodian (slightly UAI, slightly PDI, Short Orientation, and Feminist culture) are confirmed to the CCPs' perception. However, Cambodian Construction practitioners perceive IDV as a significantly to achieving good quality while their national culture dimension is the collectivist culture. By using the Friedman tests, the result of this study also revealed that the observed impacts of the principles of TQM

and NCDs on managing quality between the Cambodians is a significant difference both for self and for the foreigners.



6. SUMMARY AND CONCLUSIONS

6.1. Summary

Construction industry plays an important role in Cambodia's economy. Since now, due to Cambodia's economy got a two-digit rate growth, ASEAN integration and as it is a member of many international unions or organizations, many foreign investors come to work or invest in Cambodia in construction sector, particularly Chinese, Korean, and Japanese. The multi-nations working environment may cause many impacts, and misunderstanding.

To eliminate impacts of the multi-cultural work, the perceptions of each group or nation should be determined. To find this, the research problems, and knowledge gaps are presented which link to discuss the objectives and aim of research as described in Chapter 1. Next, the literature review on the TQM and national culture are presented in Chapter 2. It provided important points to support the objectives and aim of research of the research including National Culture Dimensions (NCDs), TQM, ISO 9000, Hofstede's cultural dimension of Cambodia, conflict and misunderstanding in multi-cultural work area, and some case studies of TQM implementation difficulty. Chapter 3 provided some review of Cambodia and its construction sector which is a key for doing business in Cambodia. It presented Cambodia's geography, economic view, international relationship, and construction and real estate sectors. In addition, at the end of the chapter, it provided the SWOT in construction industry of Cambodia which was a result from previous studies. Research construct was utilized to accomplish the different objectives of this research (refer to Chapter 4). Both primary and secondary data were adapted and collected via survey questionnaires (at construction sites, offices) for primary data and internet, books, documents, journals for secondary data. Snowball sampling (non-probability sampling) was adapted in this study. Data were analyzed by using statistical computation (using IBM SPSS® software V25) to identify the *total rank* and *mean rating* of each principles of TQM and NCDs and its attributes respectively (refer to Appendices). In addition, Friedman tests was used to analyze (refer to Chapter 5).

6.2. Results of the research

This study aims to investigate three objectives as mentioned in Chapter 1. The objective number 1 of this work was to review literature to explore the impact of NC on

implementing TQM between the Cambodians with the foreigners (see Sect. 1.2). The relevant literature review related to bidirectional relationships and culture-specific which related to the TQM and NC was the instrument to achieve the first objective. The other objectives were investigated by using survey questionnaires which was developed by integrating TQM and NCDs gap proposed by Babatunde and Low (2015).

The other two objectives of this work were aimed to observe the importance of the principles of TQM, NCDs and each attribute of its which influent on task quality in Cambodia as observed by the Cambodians for self and for the foreigners (see Sect. 1.2). The results of survey questionnaires allowed us to arrange the relative ranks for both the principles of TQM and NCDs (refer to Table 5.3 and 5.5 respectively) together with the mean rating for each attribute of the TQM and NCDs of perceived significant to quality among the Cambodians. As a result, the perception of the Cambodian practitioners of the NC impacts on quality in managing construction is almost the same as the Hofstede's cultural dimensions for Cambodian. It is showed that four Hofstede's cultural dimensions for Cambodian (UAI, PDI, Short Orientation, and Feminist culture) are confirmed to the CCPs' perception but Cambodian Construction practitioners perceive IDV as a significantly to achieving good quality while their national culture dimension is the collectivist culture. Conforming to the hypothesis of the research (see Sect. 1.2.1), it is revealed that there are considerably differences of their perceived significant for both the principle of TQM and NCDs on managing quality. This result was confirmed by analyzing nonparametric statistical tests called Friedman tests on the result from section B2 and C2 of the survey questionnaire (see Table 5.7).

6.3. Recommendations

This research provides the important attributes of each TQM principles and also rank of national culture perception of the Cambodian construction practitioners. In addition, finding the rank of national culture score of CCPs is an indicator to identify the Hofstede's cultural dimensions for Cambodian (until now there has no Hofstede's cultural dimensions for Cambodian). These are essential attentions for both the foreign firms in Cambodia and other foreign firms which want to invest in construction industry sector in Cambodia.

Firstly, to foreigners, this work underscores another viewpoint to recognize the perceptions of quality relating to construction service of the Cambodian people, both for

themselves and for the foreigners. It is emphasized that national culture is still deep-rooted influencing on the business culture. Thus, foreigners who have worked/want to work in the oversea market, should readily take of attention some cultural differences between themselves and their counterparts which could lead to effect on their business.

Next, to Cambodian, it recommends Cambodian trying to adopt the perceptions of any foreigner partners/counterparts to improving foreign investment. This mean that when Cambodian are mindful of their own culture and impacts of the perceptions of quality, there will have no potential conflicts in their work. Furthermore, it is suggested that it should provide great attention on the certification of the QMS amongst the Cambodian companies (local owned firms). As indicated from the respondents, only 38.5% of the Cambodian responders from 16 local owned companies stated that their companies (local own companies) have ISO 9001 certification (see Appendix A).

Finally, following a statistical test, this research found that there is a considerable difference between the Cambodians on their observed influence of the principles of TQM on QM (see Table 5.7). In the globalization and ASEAN integration, Cambodian firms should be started to adopt business cultures that reflect international best practices.

6.4. Limitations of the Research

Due to the limited time and possibility of the researcher, this work focused only on the Cambodian respondents. Nonetheless, it is useful to undertake this study with foreigners which can be derived a complete cross-national culture study. The survey adopted in this study is snowball sampling, that lead almost of the respondents of this have similar position, and years of experiences.

6.5. Conclusions

The purpose of this research is to investigate the strategies that would help foreigner firms (which have worked or are willing to work) to accomplish satisfying quality performance in Cambodia by giving the cultural perceptions of the Cambodian. In addition, it has determined the essential principles of TQM, dimensions of NCDs, and their attributes which are necessary for the well implementation of TQM with regard to national culture of Cambodia, as well as an important strategy to eliminate the conflicts which resist the process toward the best quality.

Through the results of the survey among the Cambodian, this study satisfied its objectives of exploring the significance of principles of TQM together with NCDs and its attributes that disturb quality of project in Cambodia. As discussed in Section 2.3.3, Cambodian's national culture was not included in Hofstede's work, thus the ranking of NCDs and important attributes (Sect. 5.4) of the Cambodian found in this study can be a contribution to the national culture study for Cambodia.



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Education

- 2016-present : Study master of science in construction management at Anadolu University, Turkey
- 2010-2015 : Graduated bachelor degree in civil engineering department of Institute of Cambodia, Cambodia

Work Experiences, Internship, and Awards

- August-October 2013 : Interned in construction site activities, conducted by LBL International of SOKHA PHNOM PENH HOTEL PROJECT.
- August 2014-June 2015 : Interned in office designed activities (draftsman) at ILI Consulting Engineers Mekong.
- June 2015-2016 : Worked at ILI Consulting Engineers Mekong as draftsman, site technical checking, modeling and designing assistance.
- 2016 : Awarded Turkish Scholarship

APPENDIX



APPENDIX A

DETAILED CHARACTERISTIC OF THE RESPONDENTS

Respondents	Age Group (Years)	Highest A. Q.	Oversea Education	Sex	Profession	Position	Experiences in Construction (years)	Company Specialty	Company order & Local/Foreign status	Company Size	Quality Ma.	Reason if no ISO 9001 Certificate
01	25-34	Masters	Y	M	Mechanical	Sale Engineer	1	Others(Supplier)	1- L	Big	Y	
02	25-34	Bachelors	N	M	Civil Eng.	Site Manager	4	Main Contractor	2-L	Medium	N	preparing
03	25-34	Bachelors	N	M	Civil Eng.	Site Manager	6	Developer	3-F	Medium	N	not yet prepare
04	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	4	Consultant	4-F	Big	Y	
05	25-34	Bachelors	N	M	Civil Eng.	CAD Operator	3					
06	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	4					
07	25-34	Bachelors	N	M	Civil Eng.	CAD Operator	2					
08	24&below	Bachelors	N	M	Civil Eng.	Sale Engineer	1	Others(Supplier)	5-L	Big	Y	
09	25-34	Bachelors	Y	F	Architect	Project Manager	3					
10	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	3	Consultant	6-F	Small	N	small, local
11	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	3	Developer	7-L	Medium	N	new company
12	35-44	Masters	N	M	Architect	Architect	10					
13	35-44	Masters	Y	F	Civil Eng.	QA/QC/QS	5					
14	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	5	Developer	8-L	Medium	N	not necessary
15	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	5					
16	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	8					
17	25-34	Bachelors	Y	F	Civil Eng.	Site Engineer (inspector)	2	Sub-Constructor	9-F	Medium	Y	
18	25-34	Bachelors	N	M	Civil Eng.	Project Manager	3					
19	25-34	Bachelors	N	M	Civil Eng.	Structural Engineer	5	Consultant	10-F	Medium	N	not yet prepare
20	25-34	Bachelors	N	M	Civil Eng.	Structural Engineer	7					
21	25-34	Masters	Y	M	Civil Eng.	Structural Engineer	4					
22	25-34	Bachelors	Y	M	Civil Eng.	Structural Engineer	3					
23	24&below	Bachelors	N	M	Civil Eng.	Structural Engineer	2					

Continued

Respondents	Age Group (Years)	Highest A. Q.	Overseas Education	Sex	Profession	Position	Experiences in Construction (years)	Company Specialty	Company order & Local/Foreign status	Company Size	Quality Ma.	Reason if no ISO 9001 Certificate
24	25-34	Bachelors	Y	M	Civil Eng.	Structural Engineer	3	Consultant	10-F	Medium	N	not yet prepare
25	35-44	Bachelors	N	M	Geotechnical	Site Engineer (inspector)	18					
26	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	2	Main Contractor	11-L	Medium	N	not yet qualified
27	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	2					
28	25-34	Bachelors	N	M	Civil Eng.	Structural Engineer	7	Developer	12-F	Small	N	not given
29	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	8					
30	25-34	Masters	Y	M	Mechanical	Structural Engineer	2					
31	35-44	Masters	Y	M	Civil Eng.	Site Engineer (inspector)	12					
32	25-34	Bachelors	N	M	Civil Eng.	Structural Engineer	2	Main Contractor	13-L	Medium	N	preparing
33	25-34	Masters	Y	M	Civil Eng.	Structural Engineer	2					
34	25-34	Bachelors	N	M	Civil Eng.	Structural Engineer	3					
35	25-34	Bachelors	N	M	Civil Eng.	Structural Engineer	3					
36	25-34	Bachelors	N	M	Civil Eng.	Technical Engineer	3	Developer				
37	35-44	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	10					
38	25-34	Bachelors	N	M	Civil Eng.	Structural Engineer	3					
39	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	2					
40	24&below	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	1					
41	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	3					
42	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	2					
43	25-34	Bachelors	N	F	Civil Eng.	QA/QC/QS	1					
44	25-34	Bachelors	N	M	Civil Eng.	Structural Engineer	4					
45	24&below	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	3					
46	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	3	Developer	15-L	Medium	Y	
47	25-34	Bachelors	N	M	Electrical	Site Engineer (inspector)	3					
48	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	3					
49	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	3	Developer	16-L	Big	Y	
50	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	3	Main Contractor	17-L	Big	N	preparing
51	35-44	Bachelors	Y	M	Civil Eng.	Project Manager	9					

Continued

Respondents	Age Group (Years)	Highest A. Q.	Oversea Education	Sex	Profession	Position	Experiences in Construction (years)	Company Specialty	Company order & Local/Foreign status	Company Size	Quality Ma.	Reason if no ISO 9001 Certificate
52	25-34	Bachelors	N	M	Civil Eng.	QA/QC/QS	3	Main Contractor	18-F	Big	Y	
53	25-34	Bachelors	N	M	Architect	Structural Engineer	3					
54	25-34	Bachelors	N	M	Civil Eng.	QA/QC/QS	3	Consultant	19-F	Small	N	not given
55	25-34	Bachelors	N	F	Civil Eng.	Site Engineer (inspector)	3					
56	24&below	Bachelors	N	M	Architect	Architect	1					
57	25-34	Bachelors	N	F	Civil Eng.	Site Engineer (inspector)	3					
58	25-34	Bachelors	N	M	Architect	Architect	6					
59	25-34	Bachelors	Y	M	Architect	Architect	2	Consultant	20-L	Small	N	not given
60	25-34	Bachelors	N	F	Architect	Architect	3					
61	25-34	Bachelors	N	M	Architect	Architect	5					
62	25-34	Bachelors	N	M	Civil Eng.	Structural Engineer	6	Consultant	21-L	Medium	Y	
63	24&below	Bachelors	N	M	Civil Eng.	Structural Engineer	3					
64	25-34	Bachelors	N	M	Civil Eng.	CAD Operator (draftsman)	2	Main Contractor	22-F	Big	Y	
65	24&below	Bachelors	N	M	Civil Eng.	QA/QC/QS	1					
66	25-34	Bachelors	N	M	Civil Eng.	Technical Engineer	3					
67	25-34	Bachelors	N	M	Civil Eng.	CAD Operator (Draftsman)	3					
68	25-34	Bachelors	N	M	Civil Eng.	CAD Operator (Draftsman)	3					
69	25-34	Bachelors	N	M	Civil Eng.	Site Manager	4	Main Contractor	23-L	Big	N	not given
70	25-34	Bachelors	N	M	Civil Eng.	CAD Operator (Draftsman)	3					
71	25-34	Bachelors	N	F	Civil Eng.	CAD Operator (Draftsman)	3					
72	25-34	Bachelors	N	M	Civil Eng.	CAD Operator (Draftsman)	3	Main Contractor	24-L	Medium	N	not yet apply
73	25-34	Bachelors	N	M	Civil Eng.	CAD Operator (Draftsman)	1					
74	25-34	Masters	Y	F	Civil Eng.	Technical Engineer	1					
75	25-34	Bachelors	N	M	Civil Eng.	QA/QC/QS	5	Developer	23-L	Big	N	not given
76	25-34	Masters	N	M	Civil Eng.	Structural Engineer	3					
77	25-34	Masters	Y	M	Civil Eng.	Structural Engineer	3	Consultant	24-L	Medium	N	not yet apply
78	25-34	Bachelors	N	M	Civil Eng.	Structural Engineer	2					
79	35-44	Masters	Y	M	Civil Eng.	Site Manager	10					
80	25-34	Bachelors	N	M	Civil Eng.	QA/QC/QS	4	Consultant	24-L	Medium	N	not yet apply
81	25-34	Bachelors	N	M	Civil Eng.	Structural Engineer	3					

Continued

Respondents	Age Group (Years)	Highest A. Q.	Overseas Education	Sex	Profession	Position	Experiences in Construction (years)	Company Specialty	Company order & Local/Foreign status	Company Size	Quality Ma.	Reason if no ISO 9001 Certificate
82	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	5	Main Contractor	25-F	Medium	Y	
83	25-34	Bachelors	N	F	Civil Eng.	CAD Operator (Draftsman)	3					
84	25-34	Bachelors	N	M	Civil Eng.	Site Engineer (inspector)	4	Consultant	26-L	Small	N	not given

APPENDIX B

RANKING OF TQM PRINCIPLES TO QUALITY AMONG THE CAMBODIAN

The Cambodian perceptions on TQM principles for themselves (n=84)							The Cambodian perceptions on TQM principles for the foreigners (n=106)						
Relative Rank	TQM Principles	Significant Ranks (a)	Frequency (b)	Frequency percent (%)	(a x b)	Total Rank	Relative Rank	TQM Principles	Significant Ranks (a)	Frequency (b)	Frequency percent (%)	(a x b)	Total Rank
1	Leadership	1	39	46.4	39	214	1	Leadership	1	34	32.1	34	326
		2	15	17.9	30				2	20	18.9	40	
		3	6	7.1	18				3	15	14.2	45	
		4	9	10.7	36				4	13	12.3	52	
		5	8	9.5	40				5	9	8.5	45	
		6	1	1.2	6				6	3	2.8	18	
		7	3	3.6	21				7	4	3.8	28	
		8	3	3.6	24				8	8	7.5	64	
2	System Approach to Management	1	11	13.1	11	261	2	Customer Focus	1	34	32.1	34	369
		2	33	39.3	66				2	6	5.7	12	
		3	13	15.5	39				3	13	12.3	39	
		4	11	13.1	44				4	16	15.1	64	
		5	6	7.1	30				5	12	11.3	60	
		6	3	3.6	18				6	17	16.0	102	
		7	3	3.6	21				7	6	5.7	42	
		8	4	4.8	32				8	2	1.9	16	
3	Customer Focus	1	16	19.0	16	336	3	System Approach to Management	1	17	16.0	17	405
		2	8	9.5	16				2	20	18.9	40	
		3	13	15.5	39				3	14	13.2	42	
		4	13	15.5	52				4	16	15.1	64	
		5	8	9.5	40				5	13	12.3	65	
		6	12	14.3	72				6	11	10.4	66	
		7	11	13.1	77				7	9	8.5	63	
		8	3	3.6	24				8	6	5.7	48	
4	Involvement of People	1	10	11.9	10	337	4	Process Approach	1	10	9.4	10	426
		2	13	15.5	26				2	25	23.6	50	
		3	15	17.9	45				3	15	14.2	45	
		4	14	16.7	56				4	16	15.1	64	
		5	11	13.1	55				5	8	7.5	40	
		6	7	8.3	42				6	14	13.2	84	
		7	9	10.7	63				7	11	10.4	77	
		8	5	6.0	40				8	7	6.6	56	
5	Process Approach	1	7	8.3	7	341	5	Involvement of People	1	5	4.7	5	483
		2	11	13.1	22				2	14	13.2	28	
		3	17	20.2	51				3	13	12.3	39	
		4	16	19.0	64				4	16	15.1	64	
		5	14	16.7	70				5	26	24.5	130	
		6	10	11.9	60				6	17	16.0	102	
		7	5	6.0	35				7	5	4.7	35	
		8	4	4.8	32				8	10	9.4	80	
6	Factual Approach	1	1	1.2	1	494	6	Continual Improvement	1	1	0.9	1	572
		2	1	1.2	2				2	8	7.5	16	
		3	8	9.5	24				3	17	16.0	51	
		4	5	6.0	20				4	11	10.4	44	
		5	17	20.2	85				5	15	14.2	75	
		6	18	21.4	108				6	12	11.3	72	
		7	18	21.4	126				7	23	21.7	161	
		8	16	19.0	128				8	19	17.9	152	
7	Supplier Relationship	1	0	0.0	0	515	7	Factual Approach	1	4	3.8	4	586
		2	2	2.4	4				2	7	6.6	14	
		3	4	4.8	12				3	11	10.4	33	
		4	9	10.7	36				4	15	14.2	60	
		5	11	13.1	55				5	10	9.4	50	
		6	17	20.2	102				6	11	10.4	66	
		7	22	26.2	154				7	25	23.6	175	
		8	19	22.6	152				8	23	21.7	184	
8	Continual Improvement	1	0	0.0	0	526	8	Supplier Relationship	1	1	0.9	1	649
		2	1	1.2	2				2	6	5.7	12	
		3	8	9.5	24				3	8	7.5	24	
		4	7	8.3	28				4	3	2.8	12	
		5	9	10.7	45				5	13	12.3	65	
		6	16	19.0	96				6	21	19.8	126	
		7	13	15.5	91				7	23	21.7	161	
		8	30	35.7	240				8	31	29.2	248	

APPENDIX C

IMPORTANCE RANKING ATTRIBUTES OF TQM

TQM Attributes	Frequency of Significant Rating for each attributes (5 and 1 being strongly agree and strongly disagree)					Mean Rating	Std. Deviation	Importance ranking
	5	4	3	2	1			
LEADERSHIP (1st ranked)								
Establishing a clear vision of the organization's future	42	35	6	1	0	4.40	0.679	1
Inspiring encouraging and recognizing people's contributions	35	37	11	1	0	4.25	0.774	2
Considering the needs of all interested parties	27	46	11	0	0	4.19	0.649	3
Establishing trust and eliminating fear	28	44	11	1	0	4.18	0.697	4
Creating and sustaining shared values, fairness and ethical role models at all levels of the organization	26	48	8	2	0	4.17	0.691	5
Setting challenging goals and targets	25	45	12	2	0	4.11	0.728	6
Providing people with the require resources, training and freedom to act with responsibility and accountability	21	45	18	0	0	4.04	0.685	7
SYSTEM APPROACH TO MANAGEMENT (2nd ranked)								
Providing the better understanding of the roles and responsibilities necessary for achieving common objectives and thereby reducing cross-functional barrier	26	46	12	0	0	4.17	0.656	1
Continually improving the system through measurement and evaluation	32	37	12	2	1	4.15	0.843	2
Structuring a system to achieve the organization's objectives in the most effective and efficient way	25	48	8	3	0	4.13	0.724	3

Continued...

TQM Attributes	Frequency of Significant Rating for each attributes (5 and 1 being strongly agree and strongly disagree)						Mean Rating	Std. Deviation	Importance ranking
	5	4	3	2	1				
Understanding organizational capabilities and establishing resources constraints prior to action	25	42	15	2	0		4.07	0.757	4
Targeting and defining how specific activities within the system should operate	18	51	15	0	0		4.04	0.630	5
Structured approaches that harmonize and integrate processes	12	61	10	1	0		4.00	0.560	6
Understanding the interdependences between the process of the system	11	54	16	2	1		3.86	0.714	7
CUSTOMER FOCUS (3rd ranked)									
Researching and understanding customer's needs and expectations	26	49	9	0	0		4.20	0.617	1
Measuring customer's satisfaction and acting on the results	25	47	11	1	0		4.14	0.679	2
Ensuring organization's objectives are inked to customer's needs and expectations	17	53	14	0	0		4.04	0.610	4
Communicating customer's needs and expectations throughout the organization	18	51	15	0	0		4.04	0.630	4

Continued...

TQM Attributes	Frequency of Significant Rating for each attributes (5 and 1 being strongly agree and strongly disagree)					Mean Rating	Std. Deviation	Importance ranking
	5	4	3	2	1			
CUSTOMER FOCUS (3rd ranked)								
Ensuring a balance approach between satisfying the customers and other interested parties	17	54	12	1	0	4.04	0.630	4
Systematically managing customer relationships	17	43	23	1	0	3.90	0.722	6
PEOPLE INVOLVEMENT (4th ranked)								
People actively seeking opportunities to enhance their competence knowledge and experience	33	43	8	0	0	4.30	0.636	1
People accepting ownership of problems and their responsibility for solving them	23	52	9	0	0	4.17	0.598	2
People understanding the importance of their contribution and role in the organization	24	49	9	1	1	4.12	0.735	3
People freely sharing knowledge and experiences	16	40	23	4	1	3.79	0.851	4
People evaluating their performance against their personal goals and objectives	10	43	27	4	0	3.70	0.741	5
People identifying constraints to their performance	7	40	31	5	1	3.56	0.782	6

Continued...

TQM Attributes	Frequency of Significant Rating for each attributes (5 and 1 being strongly agree and strongly disagree)					Mean Rating	Std. Deviation	Importance ranking
	5	4	3	2	1			
FACTUAL APPROACH (5th ranked)								
Ensuring that data and information are sufficiently accurate and reliable	37	41	5	1	0	4.36	0.652	1
Analyzing data and information using valid methods	21	58	4	1	0	4.18	0.563	2
Making data accessible to those who need it	22	52	9	1	0	4.13	0.636	3
Making decisions and taking action based on factual analysis balanced with experience and intuition	19	48	15	2	0	4.00	0.711	4
PROCESS APPROACH (6th ranked)								
Analyzing and measuring of the capability of key activities	16	59	9	0	0	4.08	0.542	1
Establishing clear responsibility and accountability for managing key activities	18	54	11	1	0	4.04	0.628	2.5
Systematically defining the activities necessary to obtain a desired result	24	42	15	3	0	4.04	0.783	2.5
Focusing on the factors such as resources methods and materials that will improve key activities of the organization	19	44	19	2	0	3.95	0.743	4
Evaluating risks, consequences and impacts of activities on customers, suppliers and other interested parties	21	38	19	5	1	3.87	0.902	5

Continued...

TQM Attributes	Frequency of Significant Rating for each attributes (5 and 1 being strongly agree and strongly disagree)					Mean Rating	Std. Deviation	Importance ranking
	5	4	3	2	1			
PROCESS APPROACH (6th ranked)								
Identifying the interfaces of key activities within and between the functions of organization	12	45	26	1	0	3.75	0.790	6
SUPPLIER RELATIONSHIP (7th ranked)								
Identifying and selecting suppliers	27	41	14	2	0	4.11	0.761	1
Establishing join development and improvement activities	27	41	12	4	0	4.08	0.810	2
Inspiring encouraging and recognizing improvement and achievements by suppliers	24	44	14	2	0	4.07	0.741	3
Clear and open communication	21	45	14	4	0	3.99	0.784	4
Pooling of expertise and resources with partners	22	39	19	4	0	3.94	0.827	5
Sharing information and future plans	18	41	23	2	0	3.89	0.761	6
Establishing relationships that balance short-term gains with long term considerations	15	39	28	2	0	3.80	0.757	7
CONTINUAL IMPROVEMENT (8th ranked)								
Employing a consistent organization wide approach to continual improvement of the organization's performance	23	43	15	2	1	4.01	0.814	1
Providing people with training in the methods and tools of continual improvement	34	42	5	2	1	4.26	0.778	2

Continued...

TQM Attributes	Frequency of Significant Rating for each attributes (5 and 1 being strongly agree and strongly disagree)					Mean Rating	Std. Deviation	Importance ranking
	5	4	3	2	1			
CONTINUAL IMPROVEMENT (8th ranked)								
Recognizing and acknowledging improvements	23	47	12	2	0	4.08	0.715	3
Making continual improvement of products processes and systems an objective for every individual in the organization	16	56	11	1	0	4.04	0.610	4
Establishing goals to guide and measures to track continual improvement	18	50	15	1	0	4.01	0.668	5

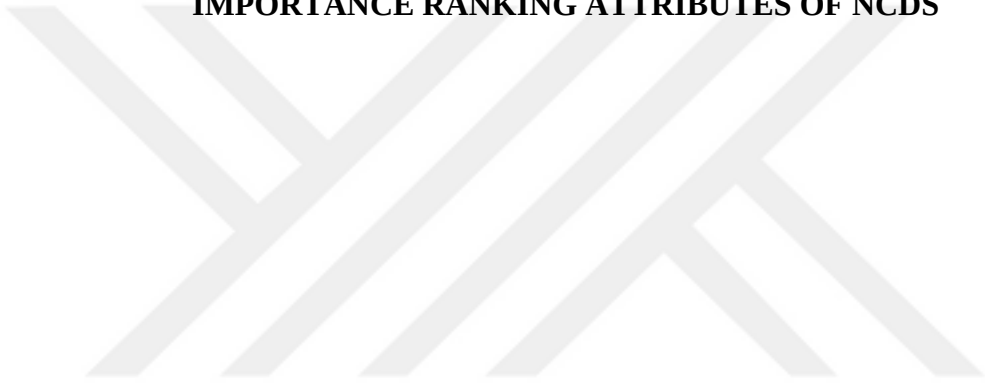
APPENDIX D

RANKING OF NCDS TO QUALITY AMONG THE CAMBODIAN

The Cambodian perceptions on NCD dimensions to themselves (n=84)						The Cambodian perceptions on NCD dimensions to foreigner (n=106)					
Relative Rank	NCD dimensions	Significant Ranks (a)	Frequency (b)	(a x b)	Total Rank	Relative Rank	NCD dimensions	Significant Ranks (a)	Frequency (b)	(a x b)	Total Rank
1	UNCERTAINTY AVOIDANCE	1	21	21	228	1	INDIVIDUALISM Vs COLLECTIVISM	1	26	26	269
		2	23	46				2	32	64	
		3	13	39				3	21	63	
		4	13	52				4	9	36	
		5	14	70				5	16	80	
2	INDIVIDUALISM Vs COLLECTIVISM	1	20	20	234	2	UNCERTAINTY AVOIDANCE	1	34	34	275
		2	17	34				2	24	48	
		3	19	57				3	14	42	
		4	17	68				4	24	96	
		5	11	55				5	11	55	
3	POWER DISTANCE	1	17	17	235	3	LONG Vs SHORT TERM ORIENTATION	1	26	26	293
		2	18	36				2	21	42	
		3	23	69				3	26	78	
		4	17	68				4	18	72	
		5	9	45				5	15	75	
4	LONG Vs SHORT TERM ORIENTATION	1	21	21	237	4	MASCULINITY Vs FEMININITY	1	16	16	332
		2	18	36				2	18	36	
		3	11	33				3	25	75	
		4	23	92				4	30	120	
		5	11	55				5	17	85	
5	MASCULINITY Vs FEMININITY	1	5	5	326	5	POWER DISTANCE	1	4	4	421
		2	8	16				2	11	22	
		3	18	54				3	20	60	
		4	14	56				4	25	100	
		5	39	195				5	47	235	

APPENDIX E

IMPORTANCE RANKING ATTRIBUTES OF NCDS



NCD Attributes	Frequency of Significant Rating for each attributes (5 and 1 being strongly agree and strongly disagree as significant to achieving good quality					Mean Rating	Std. Deviation	Importance Ranking
	5	4	3	2	1			
UNCERTAINTY AVOIDANCE (1st ranked)								
Not showing emotion (positive or negative) in spite of one’s circumstances mood or relationship with others	11	40	26	7	0	3.65	0.814	1
Not being stressed and anxious in uncertain situations such that there is no uncomfortable feeling of worry	8	41	26	9	0	3.57	0.811	2
Tolerance for uncertainty and poise/confidence under such condition	7	41	28	5	3	3.52	0.871	3
Not being too curious and cautious about what is different. Ignore perceived danger in favor of talent opportunities	6	25	25	19	9	3.00	1.119	4
INDIVIDUALISM Vs COLLECTIVISM (2nd ranked)								
Upholding self-respect by avoiding shame and loss of face for self and group. Ensuring pride, confidence, and positive thoughts	23	41	17	3	0	4.00	0.792	1
Tolerance for direct confrontation i.e. explicit expressions against having to infer from circumstances around an idea	8	49	23	4	0	3.73	0.700	2
Nurturing well-bonded in-group, with members who share interests that people outside the group do not share	15	37	26	4	2	3.70	0.902	3
POWER DISTANCE (3rd ranked)								
Encourage interdependence to eliminate absolute relevance on or control by someone or a group for continue operation	24	44	15	1	0	4.07	0.757	1

Continued...

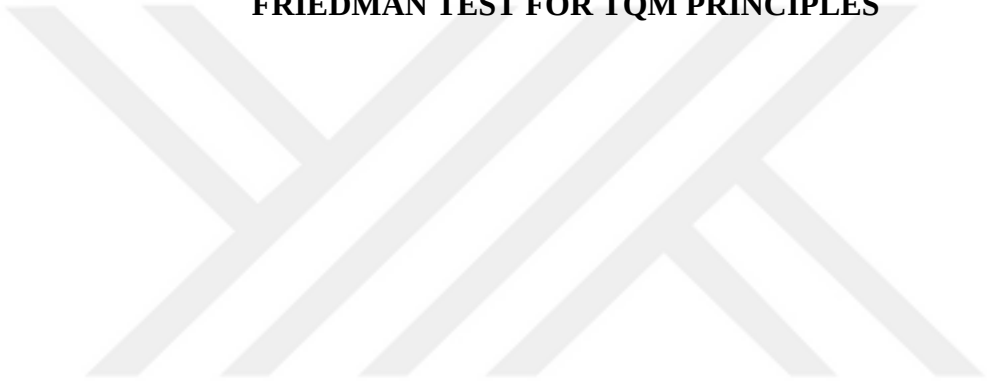
NCD Attributes	Frequency of Significant Rating for each attributes (5 and 1 being strongly agree and strongly disagree as significant to achieving good quality)					Mean Rating	Std. Deviation	Importance Ranking
	5	4	3	2	1			
Handle status with care such that relative position, which also determines rights and responsibilities are protected or maintained								
	23	44	15	1	1	4.04	0.783	2
Minimize inequalities among people such that subordinates take own initiatives and challenging the superior' opinions	20	43	19	1	1	3.95	0.790	3
Strict obedience to authority superiors holds infallible truths and are excellent such that other opinions do not necessarily count	11	27	26	8	12	3.20	1.220	4
LONG Vs SHORT TERM ORIENTATION (4th ranked)								
Respect for circumstances such that a fact or condition connected with or relevant to an event or action is preserved or referred	16	50	18	0	0	3.98	0.640	1
Persist in doing something in a determined way despite difficulty or delay in achieving success or results seem not forthcoming	13	52	17	2	0	3.90	0.670	2
Being sparing with resources and practicing thrift such that money and other resources are carefully deployed	15	43	25	1	0	3.86	0.714	3
Favor stability over personal adaptation, which arms to adjust to different condition or uses	10	44	27	3	0	3.73	0.717	4
MASCULINITY Vs FEMININITY (5th ranked)								
Assertive, ambitious, and tough. Forceful personality and strong determination to explicitly express, believe, and succeed	24	41	18	1	0	4.05	0.743	1

Continued...

NCD Attributes	Frequency of Significant Rating for each attributes (5 and 1 being strongly agree and strongly disagree as significant to achieving good quality					Mean Rating	Std. Deviation	Importance Ranking
	5	4	3	2	1			
Emphasis on challenging recognition and advancement. Encourage participating in a competitive situation for superiority	16	50	17	1	0	3.96	0.667	2
Allow competitive spirit by nurturing storing desire to be as good or to do better than others in an activity of comparable nature	18	46	17	3	0	3.94	0.750	3
Facts and feelings, willingness to try out new ways of doing things as against adopting	9	41	30	4	0	3.65	0.736	4
Something proven or the status quo	7	40	33	4	0	3.63	0.708	5

APPENDIX F

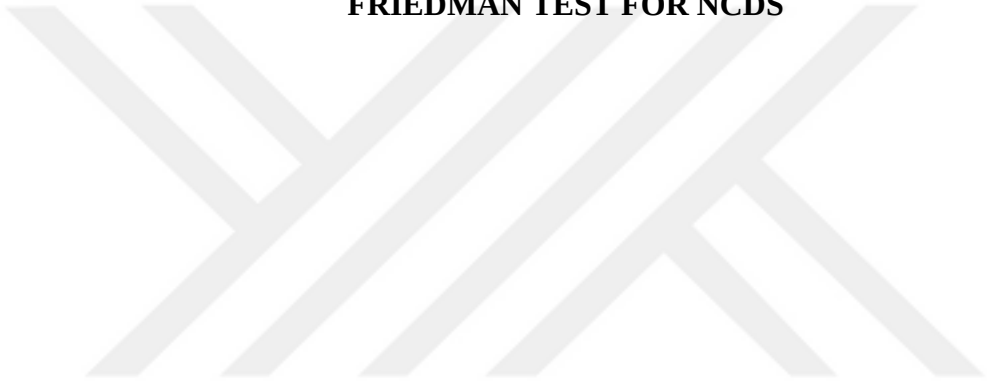
FRIEDMAN TEST FOR TQM PRINCIPLES



TQM principles	For themselves		For the foreigners	
	Total Rank (R)	R ²	Total Rank (R)	R ²
Customer focus	336	112896	369	136161
Leadership	214	45796	326	106276
Involvement of people	337	113569	483	233289
Process approach	341	116281	426	181476
System approach	261	68121	405	164025
Continual improvement	526	276676	572	327184
Factual approach	494	244036	586	343396
Supplier relationship	515	265225	649	421201
$\sum R^2$	1242600		1913008	
n (number of responses)	84		106	
k (TQM principles)	8			
12/nk (k+1)	0.001984127		0.001572327	
3n (k+1)	2268		2862	
$Fr = 12/nk (k+1) \sum R_j^2 - 3n (k+1)$	197.476		145.874	
Degree of Freedom v = k-1	7			
Critical Value at $\alpha = 0.05$, two-tailed	14.067			

APPENDIX G

FRIEDMAN TEST FOR NCDS



NCD dimensions	For themselves		For the foreigners	
	Total Rank (R)	R ²	Total Rank (R)	R ²
Power distance	235	55225	421	177241
Individualism vs Collectivisms	234	54756	269	72361
Masculinity vs Femininity	326	106276	332	110224
Uncertainty avoidance	228	51984	275	75625
Long vs Short term orientation	237	56169	293	85849
$\sum R^2$	324410		521300	
n (number of responses)	84		106	
k (NCDs)	5			
$12/nk (k+1)$	0.004761905		0.003773585	
$3n (k+1)$	1512		1908	
$Fr = 12/nk (k+1) \sum R_j^2 - 3n (k+1)$	32.810		59.170	
Degree of Freedom $v = k-1$	4			
Critical Value at $\alpha = 0.05$, two-tailed	9.488			

APPENDIX H

SURVEY QUESTIONNAIRES (Babatunde and Low, 2015)

Survey Questionnaire on the Perceptions of the Influence of National Culture on Quality Management among the Cambodians Construction Practitioners (CCPs)



SECTION A: Bio-data. (Approx. 5 mins)

In this section we would like to know company and your brief personal data. Please fill tick in the box as applicable ☒.

Age Group (years):

24 & below ☐

25-34 ☐

35-44 ☐

55-64 ☐

Highest academic qualification:

Diploma ☐

Bachelors ☐

Masters ☐

Doctorate ☐

Others ☐ (please state)

Overseas education (academic qualification or vocational training):

Yes ☐

No ☐

Sex:

Male ☐

Female ☐

Company specialty:

Developer ☐

- Consultant ☐
- Main Contractor ☐
- Sub-contractor/Specialist ☐
- Others ☐ (please state)

Company size (i.e. staff strength):

- Small ☐
- Medium ☐
- Large ☐

Profession _____ **Designation** _____ **Years of experience** _____

Professional Affiliation: if you are registered member of a professional body (e.g. Architects, Engineers, Quality Surveyors, Project Manager, etc.), please state.

Quality Management: Is your Company's quality management system ISO 9001 certified?

Yes ☐

No ☐

If your answer on ISO 9001 certificate is "NO", please state reason(s)

SECTION B1: Perceptions of the significance of the attributes of the TQM principles on quality management. (Approx. 15 mins)

This section presents attributes of each of the eight TQM principles given in Section B2. Please rank on the 5-point scale, in the next Table, to indicate your degree of agreement of the perceived significance of the application of each of the attributes to achieving good quality (5 being “strongly agree” and 1 being “strongly disagree” as insignificant to achieving good quality).

Principles of TQM	Attributes of TQM	Strongly agree	Agree	Nether agree nor disagree	Disagree	Strongly disagree
		5	4	3	2	1
Customer Focus	Researching and understanding customer's needs and expectations					
	Ensuring organization's objectives are inked to customer's needs and expectations					
	Communicating customer's needs and expectations throughout the organization					
	Measuring customer's satisfaction and acting on the results					
	Systematically managing customer relationships					
	Ensuring a balance approach between satisfying the customers and other interested parties					
Leadership	Considering the needs of all interested parties					
	Establishing a clear vision of the organization's future					

Principles	Attributes	5	4	3	2	1
Leadership	Setting challenging goals and targets					
	Creating and sustaining shared values, fairness and ethical role models at all levels of the organization					
	Establishing trust and eliminating fear					
	Providing people with the require resources, training and freedom to act with responsibility and accountability					
	Inspiring encouraging and recognizing people's contributions					
People Involvement	People understanding the importance of their contribution and role in the organization					
	People identifying constraints to their performance					
	People accepting ownership of problems and their responsibility for solving them					
	People evaluating their performance against their personal goals and objectives					
	People actively seeking opportunities to enhance their competence knowledge and experience					
	People freely sharing knowledge and experiences					

Principles	Attributes	5	4	3	2	1
Process Approach	Systematically defining the activities necessary to obtain a desired result					
	Establishing clear responsibility and accountability for managing key activities					
	Analyzing and measuring of the capability of key activities					
	Identifying the interfaces of key activities within and between the functions of organization					
	Focusing on the factors such as resources methods and materials that will improve key activities of the organization					
	Evaluating risks, consequences and impacts of activities on customers, suppliers and other interested parties					
System Approach	Structuring a system to achieve the organization's objectives in the most effective and efficient way					
	Understanding the interdependences between the process of the system					
	Structured approaches that harmonize and integrate processes					

Principles	Attributes	5	4	3	2	1
System Approach	Providing the better understanding of the roles and responsibilities necessary for achieving common objectives and thereby reducing cross-functional barrier					
	Understanding organizational capabilities and establishing resources constraints prior to action					
	Targeting and defining how specific activities within the system should operate					
	Continually improving the system through measurement and evaluation					
Continual Improvement	Employing a consistent organization wide approach to continual improvement of the organization's performance					
	Providing people with training in the methods and tools of continual improvement					
	Making continual improvement of products processes and systems an objective for every individual in the organization					
	Establishing goals to guide and measures to track continual improvement					

Principles	Attributes	5	4	3	2	1
Continual Improvement	Recognizing and acknowledging improvements					
Factual Approach	Ensuring that data and information are sufficiently accurate and reliable					
	Making data accessible to those who need it					
	Analyzing data and information using valid methods					
	Making decisions and taking action based on factual analysis balanced with experience and intuition					
Supplier Relationship	Establishing relationships that balance short-term gains with long term considerations					
	Pooling of expertise and resources with partners					
	Identifying and selecting suppliers					
	Clear and open communication					
	Sharing information and future plans					
	Establishing joint development and improvement activities					
	Inspiring encouraging and recognizing improvement and achievements by suppliers					

SECTION B2: Perceptions of the significance of Total Quality Management (TQM) principles to quality management. (Approx. 5 mins)

Please arrange the following TQM principles (8 in total) as perceived to be significant to quality management in your company (starting from the most significant at the top i.e. 1). Please refer to the brief descriptions of the principles provided under the list.

- | | |
|-----------------------------------|----------------------------|
| (A) Customer focus | (B) Leadership |
| (C) Involvement of people | (D) Process approach |
| (E) System Approach to management | (F) Continual improvement |
| (G) Factual Approach | (H) Supplier Relationship. |

1. (Most significant to quality)
2.
3.
4.
5.
6.
7.
8. (Least significant to quality)

Descriptions:

- a) **Customer Focus** - Ensuring current products and/or services deliver customer satisfaction will continue to do so in the future.
- b) **Leadership** - Senior and Middle Managers' clear involvement in promoting and leading quality improvement.
- c) **Involvement of People** - Encouragement of company-wide (i.e. all departments) contribution to Quality improvement.
- d) **Process Approach** - improvement in processes used in delivering output to both external and internal customers.
- e) **System approach to management** - Adoption of systems to delivery consistent products and services.
- f) **Continual Improvements** – Planning and setting goals for quality improvements.
- g) **Factual Approach** – Use of information resources in the drive for quality improvement. Quality improvements decision should be based on some facts.
- h) **Supplier Relationship** – The use of high-regard, interdependent and mutually beneficial supply chain to create value.

SECTION C1: Perceptions of the significance of the attributes of the national cultural dimensions on quality management. (Approx. 10 mins)

This section presents attributes of each of the five national cultural dimensions given in the section C2. Please rank on a 5-point scale in the next table to indicate your degree of agreement of the perceived significance of the application of each of the attributes to achieving good quality (5 being “strongly agree” and 1 being “strongly disagree” as insignificant to achieving good quality).

Dimensions of National Culture	Attributes of the dimensions of National Culture	Strongly agree	Agree	Nether agree nor disagree	Disagree	Strongly disagree
		5	4	3	2	1
Power Distance	Minimize inequalities among people such that subordinates take own initiatives and challenging the superior’ opinions					
	Handle status with care such that relative position, which also determines rights and responsibilities are protected or maintained					
	Encourage interdependence to eliminate absolute relevance on or control by someone or a group for continue operation					
	Strict obedience to authority superiors holds infallible truths and are excellent such that other opinions do not necessarily count					
Individualism versus Collectivism	Nurturing well-bonded in-group, with members who share interests that people outside the group do not share					
	Tolerance for direct confrontation i.e. explicit expressions against having to infer from circumstances around an idea					

Dimensions	Attributes	5	4	3	2	1
Individualism versus Collectivism	Upholding self-respect by avoiding shame and loss of face for self and group. Ensuring pride, confidence, and positive thoughts					
Masculinity versus Femininity	Emphasis on challenging recognition and advancement. Encourage participating in a competitive situation for superiority					
	Assertive, ambitious, and tough. Forceful personality and strong determination to explicitly express, believe, and succeed					
	Facts and feelings, willingness to try out new ways of doing things as against adopting					
	Something proven or the status quo					
	Allow competitive spirit by nurturing storing desire to be as good or to do better than others in an activity of comparable nature					
Uncertainty Avoidance	Tolerance for uncertainty and poise/confidence under such condition					
	Not being stressed and anxious in uncertain situations such that there is no uncomfortable feeling of worry					
	Not showing emotion (positive or negative) in spite of one's circumstances mood or relationship with others					
	Not being too curious and cautious about what is different. Ignore perceived danger in favor of talent opportunities					

Dimensions	Attributes	5	4	3	2	1
Long term versus Short term orientation	Persist in doing something in a determined way despite difficulty or delay in achieving success or results seem not forthcoming					
	Being sparing with resources and practicing thrift such that money and other resources are carefully deployed					
	Respect for circumstances such that a fact or condition connected with or relevant to an event or action is preserved or referred					
	Favor stability over personal adaptiveness, which arms to adjust to different condition or uses					

SECTION C2: Perceptions of the significance of the National cultural dimensions on quality management. (Approx. 5 mins)

The under-listed national cultural dimensions (5 in total) are used to measure cultural differences between two or more countries.

(A) Power Distance

(B) Individualism versus Collectivism

(C) Masculinity versus Femininity

(D) Uncertainty Avoidance

(E) Long Term Orientation versus Short Term Orientation.

Please arrange the five national cultural dimensions as perceived to be significant to quality management in your company (starting from the most significant at the top i.e. 1). Please refer to the brief descriptions of the cultural dimensions provided under the list.

1. (Most significant to quality)
2.
3.
4.
5. (Least significant to quality)

Descriptions:

- a. **Power distance** - is the extent to which the less powerful members of institutions and organizations within a country.
- b. **Individualism / collectivism** - is the extent to which the ties between individuals are either loose (individualism) or integrated into strong cohesive in groups (collectivism).
- c. **Masculinity / Femininity** - is the extent of the desirability for assertive behavior (masculine) or modest behavior (feminine) in a society.
- d. **Uncertainty Avoidance** - is the extent to which a society feels threatened by ambiguous or unknown situations expressed through intolerable anxiety or nervous stress and in a need for predictability.
- e. **Long Term Orientation / Short Term Orientation** - is the extent to which a society values the virtues of persistence the status and having a sense of shame.

SECTION D: How the Cambodian Construction Practitioners perceive the TQM principles to be significant to quality management among the Foreign Construction Practitioners working in Cambodia. (Approx. 5 mins)

Based on your working experience with foreign construction firm(s), please arrange the following eight TQM principle, as you perceive to be significant to quality management among the foreign construction practitioners (starting from the most significant at the top i.e. 1 and finishing to the least significant to quality at the lowest i.e. 8)

- (A) Customers Focus (B) Leadership (C) Involvement of People
 (D) Process Approach (E) System Approach (F) Continual Improvement
 (G) Factual Approach (H) Supplier Relationship.

Rank	Foreigner's Nationality		
	*		
1			
2			
3			
4			
5			
6			
7			
8			

**: write any foreign nationalities which you used to work with (e.g. Korean, Japanese, Chinese).*

SECTION E: How the Cambodian Construction Practitioners perceive National Cultural Dimensions to be significant to quality management among the Foreign Construction Practitioners working in Cambodia.

(Approx. 5 mins)

Based on your working experience with foreign construction form(s), please arrange the five national cultural dimensions as you perceive to be significant to quality management among the foreign construction practitioners (starting from the most significant at the top i.e. 1 and finishing to the least significant to quality at the lowest i.e. 5)

- (A) Power Distance (B) Individualism versus Collectivism
(C) Masculinity versus Femininity; (D) Uncertainty Avoidance
(E) Long Term Orientation versus Short Term Orientation.

	Foreigner's Nationality		
Rank	*		
1			
2			
3			
4			
5			

*: write any foreign nationalities which you used to work with (e.g. Korean, Japanese, Chinese).



Thank you for your participation!