A CULTURICON DESIGN MODEL FOR COMMUNICATION ACROSS CULTURE

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Abstrak

Emotikon adalah penting dalam komunikasi perantaraan komputer kerana kemampuannya untuk mengekspresi emosi dan tindakan tanpa pertemuan secara bersemuka. Walau bagaimanapun, emotikon yang ada masih tidak sesuai dan tidak mempunyai beberapa ekspresi manusia yang mengehadkan pemilihan pengguna untuk ekspresi yang sesuai, terutama daripada segi budaya. Berdasarkan tinjauan literatur secara komprehensif, kajian mengenai emotikon dalam perspektif budaya adalah terhad dan terdapat permintaan untuk lebih banyak emotikon berasaskan budaya dibangunkan. Untuk menyelesaikan masalah ini, kajian ini membangunkan Model Reka Bentuk Culturicon (CDM) dengan menggabungkan dimensi budaya dan prinsip reka bentuk ikon yang sesuai, dimana Culturicon adalah gabungan '*culture*' dan '*icon*'. Komponen CDM ditentukan berdasarkan dapatan kajian terdahulu. Kemudian, CDM disahkan melalui penilaian pakar dengan menggunakan kaedah campuran *convergent parallel* dengan mengukur komponen, aliran, dan kebolehbacaan model yang melibatkan 11 orang pakar. Kemudian, CDM disahkan dengan menggunakan kaedah campuran *explanatory sequential* melibatkan dua fasa - pengesahan oleh pereka dan pengguna akhir. Pengesahan oleh pereka mengukur komponen model dalam aspek mencapai kepuasan, kepuasan antara muka, kepuasan sokongan tugas, dan pembangunan sampel emotikon yang melibatkan lima orang pereka. Pengesahan oleh pengguna akhir dilakukan melalui perbincangan kumpulan fokus, melibatkan lapan pengguna akhir. Analisis tematik digunakan untuk menganalisis keputusan kumpulan fokus. Versi akhir CDM terdiri daripada lima dimensi budaya (jarak kuasa yang tinggi, kolektivisme yang tinggi, pengelakan ketidakpastian yang rendah, kelelakian/kewanitaan yang sederhana dan hubungan jangka masa panjang), dan lapan prinsip reka bentuk ikon interaksi manusia komputer (HCI) (boleh dikenalpasti, boleh difahami, menarik, koheren, bermaklumat, berbeza, mudah diingati, dan boleh dibaca). Keputusan kumpulan fokus menunjukkan bahawa sampel emotikon mewakili unsur budaya, memenuhi prinsip reka bentuk ikon HCI, dan berguna dalam komunikasi mereka merentas budaya. Model ini menyumbang kepada pengetahuan dalam HCI. Ia boleh dijadikan sebagai garis panduan oleh pereka untuk membangunkan Culturicon di masa hadapan untuk memberi lebih banyak pilihan emotikon daripada budaya tempatan dan memenuhi keperluan pengguna akhir.

Kata kunci: Emotikon berasaskan budaya, Model Reka Bentuk Culturicon, Dimensi budaya, Prinsip reka bentuk ikon, Penilaian pakar.

Abstract

Emoticons are important in Computer-Mediated Communication due to its capability to express emotions/actions without face-to-face meeting. However, existing emoticons are still incompatible and lack some human expressions that limit user's selection, particularly in terms of culture. Based on the comprehensive literature review conducted, the study regarding emoticons in cultural perspective is limited and there are demand for more cultural-based emoticons to be developed. To solve the issue, this study developed a model named Culturicon Design Model (CDM) by incorporating appropriate cultural dimensions and icon design principles, where Culturicon is the combination of 'culture' and 'icon'. The components of CDM were determined based on previous study's findings. CDM was then verified through expert review by applying a convergent parallel mixed method that measured the model's components, flow, and readability, involving 11 experts. Then, CDM was validated by applying an explanatory sequential mixed method involving two phases - validation by designers and validation by end users. Validation by designers measured the components of the model in terms of gain satisfaction, interface satisfaction, task support satisfaction, and emoticon samples' development, involving five designers. The validation by the end user was performed through focus group discussions, involving eight participants. Thematic analysis was used to analyse focus group's results. The final version of CDM comprises five cultural dimensions (high power distance, high collectivism, low uncertainty avoidance, moderate masculinity/femininity, and long-term relationships), and eight Human Computer Interaction (HCI) icon design principles (familiar, understandable, attractive, coherent, informative, distinct, memorable, and legible). Focus group's result showed that the emoticon's samples represent the cultural elements, fulfilled the HCI icon design principles, and useful in their communication across culture. CDM contributed to the body of knowledge in HCI. It can be a guideline for designers to develop Culturicon in the future, hence providing more emoticon selections from local culture to satisfy end user's needs.

Keyword: Cultural-based emoticon, Culturicon Design Model, Cultural dimensions, Icon design principles, Expert review.

Acknowledgement

Table of Contents

ix

List of Tables

List of Figures

xiv

xv

List of Appendices

A. Selected Papers for Review and Analysis

B. Questionnaire Questions

C. Expert Request for Nomination Letter

D. Expert Review Cover Letter

E. Expert Verification Documents

F. Expert Verification Results

G. Revised Version of Culturicon Design Model

H. Designer Request for Nomination Letter

I. Designer Validation Documents

J. Designer Validation Results

K. Frequencies of the Usage of Samples of Culturicon

L. End User Validation Documents

M. Focus Group Finding

List of Abbreviations

ASCIIS	American Standard Code for Information Interchanging Symbol
CDM	Culturicon Design Model
CLR	Comprehensive Literature Review
CMC	Computer Mediated Communication
F2F	Face-to-Face
HCI	Human Computer Interaction
LUI	Local Upload Images
MCMC	Malaysian Communication and Multimedia Commission
PDI	Preload Dynamic Images
SLR	Systematic Literature Review
PSI	Preload Static Images

List of Publication

1. A Systematic Review on Emoticon Usage Pattern for Collective Interaction in CMC.

2. A Survey to Identify the Demand on Cultural Emoticon in Malay Context.

3. A New Model for Cultural-Based Emoticon in Distributed Collective Interaction Via CMC

4. Culturicon Model: A New Model for Cultural-Based Emoticon

5. Culturicon Design Model for Social Mobile Application

CHAPTER ONE
INTRODUCTION

1.0 Introduction

This chapter gives an overview of the entire study. It includes the main topic of the study including an introduction to distributed collective interactions, emoticons, Computer-Mediated Communication (CMC), and Human-Computer Interaction (HCI). In doing so, this chapter begins with the study's background, followed by the problem statement, research questions, research objectives, research scope, research significance, and research framework. Finally, the structure of the thesis is presented in this chapter.

1.1 Background of Study

At present, the number of users of smartphones and the growth of smartphone applications have been increasing so rapidly, enabling CMC to be a platform for distributed collective interaction (Malaysian Communications and Multimedia Commission, 2018). Distributed collective interaction is defined as interaction involving a large group of people communicating across geographical and conceptual distances, heterogeneous perspectives, collective resources, time, and experiences through the use of technology such as CMC (Ripoche & Sansonnet, 2005).

In addition to traditional methods like email, mobile messaging applications such as Telegram, WhatsApp, WeChat, and Facebook Messenger have been developed for the purpose of performing CMC. Because these applications were developed for mobile

phone devices, users have been able to experience technology in a more accessible and usable manner in their daily CMC routines.

The role of HCI has become increasingly important as the number of mobile phone users and applications has grown. This is due to the fact that mobile interaction is one aspect of HCI that deals with how mobile phones are used as a medium of communication between users (Bunagan & Nabil, 2016; Kaufhold, Reuter, Comes, Mirbabaie, & Stieglitz, 2021).

In using these mobile messaging applications, the manifestation of emotions, actions, situations, and gestures in distributed collective interaction has become a phenomenon in CMC. The most well-known and widely used method of delivering these manifestations is through the use of emoticons and emoji (Goh & Kulathuramaiyer, 2020; Liu, Du, & Zhou, 2020; Teh, Boon, & Gill, 2020; Sanjaya Wijeratne, Saggion, Kiciman, & Sheth, 2020; Yinxia, Zhang, Fei, Qian, & Donghong, 2020).

This study uses the term emoticon to refer to both emoticons and emoji because they both fall under the category of pictographic representation in CMC, with the understanding that emojis are the enhanced version of emoticons. By leveraging these manifestations in CMC, communication will become more successful, resulting in the increased operational efficiency and information exchange in people's daily lives without the need for face-to-face (F2F) meetings, where the practice appears to be embraced by users (Teh et al., 2020; H. C. Wang, Fussell, & Setlock, 2009).

Prior studies has revealed that using emoticons in CMC is more effective than sending a text-only message because emoticons provide additional features that indicate the

2

emotional information cues (Derks, Bos, & Grumbkow, 2007a; Ganster, Eimler, & Krämer, 2012; Goh & Kulathuramaiyer, 2020; Liu et al., 2020; Lo, 2008). As a result, the use of emoticons is important to prevent misunderstandings and misinterpretations of the senders' messages.

According to Derks, Bos and von Grumbkow (2008), the use of text-only message in CMC communication is lack with the visual cues, which might lead to misinterpretation of messages. This may occur if the receiver is unable to identify the sender's correct intention or mood just from the text-only in every readable message received. The addition of emoticons in text messages can change the level of understanding by assisting the receiver in interpreting the sender's correct emotion, mood, and intention, hence experiencing a better understanding of the message.

Furthermore, the use of emoticons in CMC via smartphone has become an essential in daily communication, which aligns with the year-on-year growth of smartphone users and internet users, according to a survey conducted by Malaysian Communications and Multimedia Commission (2018). In 2018, MCMC has conducted a survey to 2,401 hand phone users in Malaysia with the objective to collect descriptive statistics pertaining to characteristics and behaviors of hand phone users. According to the findings of the survey, the number of smartphone users has risen from 75.9% in 2017 to 78% in 2018. This is due to the increasing use and dependence on the smartphone applications, as well as low-cost smartphones, government subsidies, greater competition and promotions among service providers, and reasonable packages.

In addition, the survey also compared the percentage distribution of smartphone and feature phone users according to the age group. For teenagers (15 to 19 years old),

93.5% own smartphone compared to 11.5% that own feature phone. While for young adult (20-34 years old), 88% own smartphone compared to 15.8% that own feature phone. For middle-aged adult (35-49 years old), 76.2% own smartphone compared to 28.1% that own feature phone. For older adult (50 years old and above), 49.8% own smartphone compared to 53.8 % that own feature phone. Based on this finding, it can be seen that teenagers are more inclined to use smartphones, and the odds of a respondent using a smartphone decreases as the respondent's age rises.

The survey also reported that in Malaysia, 94.6% of smartphone users use their phones to get online, indicating that accessing the Internet while on the go is becoming more popular. Interestingly, 98.1% of smartphone users use their device for text messaging and sending voice notes for communication, which is the most common reason they use their phones to get online, indicating that communication remains the most popular activity among smartphone users. With the growing popularity of mobile messaging applications like WhatsApp, Telegram, and Facebook Messenger, which update their features on a regular basis to meet the needs of their users, communication via CMC has become indispensable.

This can be proven by the survey results that reported checking mobile messaging application was the first activity that the majority of respondents (75.9%) did after waking up. Meanwhile, 9.3% visited their social network accounts and 4.7% check their emails. The results have obviously shown the level of obsession among user towards online communication via smartphone. These user behaviours also demonstrate a significant affinity between the user and their smartphone, indicating a good opportunity for content providers to capitalise on the positive use of smartphones

4

by providing more useful mobile phone applications and its features, as for this study is the development of more beneficial, effective, and meaningful emoticon.

Communication through CMC has also become a vital mechanism in modern communication technology, either through one-to-one interaction or a distributed collective interaction. One-on-one interaction takes place when an individual interacts with another individual, whereas distributed collective interaction is the engagement of a large group of individuals across the geographical and conceptual distances, heterogeneous perspectives, collective resources, time, and experiences by utilising technology like CMC (Ripoche & Sansonnet, 2005). To date, smartphone is the top computer-mediated device for users to perform CMC in mobile circumstances because its capability to carry the better Internet access compared to other devices according to the survey by Malaysian Communications and Multimedia Commission (2018).

Besides that, most of the mobile messaging application has the feature to perform distributed collective interaction, in which the communication can happen between all users in the same group simultaneously. When CMC is used especially for distributed collective interaction via mobile messaging application or social media application, intercultural encounters are common. Users in the distributed collective interaction group may come from a variety of backgrounds, races, and cultures, resulting in a variety of message understanding and interpretation. For example, when using the CMC for learning or business purposes, sometimes user have to communicate with a lecturer or supplier who may be from a different culture.

The prospect of having a distributed collective interaction is encouraging, given the widespread use of smartphone for text communication, social media, and online

5

communities. According to Roughton, Warren and Plimmer (2014), collective interaction can foster the values of unity, belonging, and shared delight by providing a wide range of opportunities to share the collective experience with others. Based on this, it can be determined that the objective of collective interaction is to establish mutual communication through shared joy and unity, which is able to form a platform for healthy communication among users.

In doing so, users should avoid misinterpretation and misunderstanding of messages, especially while engaging in intercultural communication, because the users' backgrounds may differ in terms of geography, religion, and a variety of other factors (Goh & Kulathuramaiyer, 2020). Lack of knowledge and sensitivity to other cultures can lead to serious intercultural conflicts. Thus, intercultural understanding is critical in distributed collective interaction and in a globalised world to avoid intercultural conflicts (Perry & Southwell, 2011).

Past studies have proposed several approaches for users to improved their intercultural understanding including intercultural training (J.M Bennett, Bennett, & Landis 2004; Pusch 2004), intercultural learning at school (Davies & Read, 2005), and visiting abroad (Medina-Lopez-Portillo, 2004). For intercultural training approach, it refers to the training for workers that requires them to engage with people from various cultures. This training will give them a greater knowledge of the cultures with which they will be interacting. Lectures, culture assimilators, and class discussions are prominent methods in intercultural training (Mendenhall, 2004).

For learning intercultural at school approach, it refers to the learning of an academic subject such as social studies or foreign languages depending on the orientation of the

curriculum (Davies & Read 2005). Currently, the learning process can take place not only in the classroom, but also through the web-based technologies that act as interactive tools that capable of providing the interaction with foreign language teachers, giving them the flexibility to learn whenever and wherever they want.

The application of online learning through Google Meet, Webex and Zoom meeting are the example of web-based technology that can be utilised for intercultural learning. Perry and Southwell (2011) argued that the degree to which intercultural competence can be developed via digital technologies has not yet been examined thoroughly. The emergence of a lot of social media applications for collective interaction can be used as the new platform to learn and experience the intercultural learning directly or indirectly.

For the visit abroad approach, study has shown that the method can increased the intercultural understanding through the experience of interacting with local people (Medina-Lopez-Portillo, 2004). Students who study abroad either by long programmed or short programmed could develop the intercultural sensitivity intensively.

However, other people may need to consume a lot of time and money to make them able to visit abroad for such period of time. Perry and Southwell (2011) encouraged researcher to explore other types of learning experiences and settings to develop intercultural understanding, as intercultural training programs and overseas stays are not readily accessible.

Therefore, learning and gaining intercultural knowledge and experience through the usage of mobile messaging application may provide a good solution as it does not consume a lot of money and time. The current technology in mobile messaging application via CMC can be utilized to the fullest in a way to deliver intercultural knowledge and experience especially during distributed collective interaction.

Since CMC cannot provide the exact expression as equal as F2F communication, the use of emoticons is crucial in expressing emotion, feelings, actions, and cultures in a way to act as the virtual physical expression of the participants. In addition, the use of emoticons is also capable to decrease the intensity of the intercultural communication. Therefore, CMC required more meaningful emoticons that able to describe the user's expressions for each situation that related to culture, belief, race, faith, and religion.

Apart from adding the extra cues of emotional information, prior studies have shown that emoticons are not merely limited in conveying emotions, but also related to social-cultural norms (Goh & Kulathuramaiyer, 2020; Park, Barash, Fink, & Cha, 2013; Sanjaya Wijeratne et al., 2020). Park et al. (2013) stated in their study that the use of emoticons is varied according to geography and culture. This is due to the different interpreting style and language used while communicating via CMC.

The same point was made by Goh and Kulathuramaiyer (2020), who stated that users from different geographies, languages, and cultures can interpret and use the same emoticon differently than the original meaning. Based on these reporting, the use of emoticons can be exploited to a wider range of perspectives rather than solely producing the form of emotional expression's information. For example, emoticons can be exploited to express cultural element in text messages, especially during

8

distributed collective interaction among users who come from different geographies and cultures.

However, according to the comprehensive literature review (CLR) conducted, study related to cultural-based emoticons are still lacking, and further investigation is crucial for future benefit.

In studying the new model of cultural-based emoticon for distributed collective interaction, the incompatible and lack of cultural-based emoticon that depict the cultures of Malaysia will be examined. In order to do so, the appropriate requirement and model of Malaysian cultural-based emoticons need to be taken into further investigation. Hence, a new model for cultural-based emoticon design needs to be developed, in which emoticons would signify the more meaningful, novel, culturally rich, and up-to-date communication element, which in line with the world current technology.

1.2 Problem Statement

The usage of emoticon in distributed collective interaction via CMC are capable of giving advantages to users. However, past studies have shown that emoticon lacks in terms of limited emoticon selection, emoticon misinterpretation and misused especially with people from different culture (Feng, Lu, Zhou, Wang, & Cao, 2020; Goh & Kulathuramaiyer, 2020; Kimura-Thollander & Kumar, 2019; Miller et al., 2016; Toratani & Hirayama, 2011; S Wijeratne, Lakshika, Sheth, & Doran, 2016; Wiseman & Gould, 2018).

To date, the emoticon selections are limited, incompatible and missing some human actions, emotions and expression that limit the user from choosing the suitable emoticons to express their real humanize intentions especially for the country other than emoticon developer's country such as Malaysia where the differences in culture are obvious.

Feng et al. (2020) in their study reported that 75% mobile messaging application user requested for more emoticon to be created, especially people from non-native English speakers. In addition, Kimura-Thollander and Kumar (2019) also mentioned the lack of emoticon selection by stating that emoticon cultural differences are not only limited to race or disability, they can include international boundaries. Based on their survey results, they discovered that people from various cultural backgrounds believe there are emojis missing from the available selection that they may expect or want to see.

For example, the emoji 5.0 (belong under the category of emoticon according to Cao and Ye (2009)) contains 94 emojis of Japanese origin, accounting for 4% of the total. Following Japan is the United States, with 31 emojis of American origin accounting for roughly 1% of all emojis (Kimura-Thollander & Kumar, 2019). Following those two countries are the United Kingdom and China, each with 6 emojis (0.2 %), and France and Mexico, each with 2 emojis (essentially 0%). These origins were determined by examining the emoji's design inspiration and where it originated. The remaining 94% of emojis are mostly people-related emoji.

These findings shows that the current emoticon selections are unbalanced and insufficient for users to use in their communications, particularly emoticons that include cultural elements from countries other than the ones mentioned previously.

Due to a lack of emoticon options, particularly emoticons depicting their culture, they may be unable to express their true intentions in their communications.

To add to this matter, Miller et al. (2016) argued in their study that the meaning of an emoticon is through its graphic resemblance to a physical object, but still it is not well understood how people interpret the meaning of emoticon because emoticon may be more open to interpretation. The variance of emoticons interpretation that they observed may be detrimental to the successful use of emoticons in communication. Kimura-Thollander and Kumar (2019), and Jiang, Brubaker, and Fiesler (2017) agreed with this issue as they stated in their study that the cultural aspects of emoticons remain less understood and emoticons are interpreted in inconsistent ways even though they are the most used nonverbal communication in CMC.

In the same vein, Wijeratne et al. (2016) also stated that emoticons allowed people to develop their own use and interpretation because emoticons were defined with no rigid semantics attached to them. Since the interpretation of emoticon is open, when user from different culture encounters the emoticons that they are not familiar with, the chance they will misinterpret the emoticons are high.

Meanwhile, Goh and Kulathuramaiyer (2020) explained that when it comes to users from various geographies, languages, and cultural backgrounds, the use of the universal pictograph standard, which was created using Unicode, creates ambiguity. As a result, people from different cultural backgrounds can interpret and use the same emoticon differently, contrary to its original meaning. For example, some people use the rainbow emoticon to represent the actual rainbow, while others use it as a symbol for LGBTQ. The brinjal and peach emoticons are similar in that some people use them

11

to represent the vegetable and fruit, while others use them to make sexual jokes. When the emoticon selections are limited, users who are forced to use the existing emoticons (even if they may not reflect their true intentions) may use the incorrect emoticons, resulting in incorrect communication interpretation.

Miller et al.(2016) mentioned about the linguistic theory by Clark (1996) where in order for two people to have a successful communication, they must have the same interpretation of a message. This means that when the receiver's interpretation differs from sender's intended meaning, a miscommunication occurs. Miscommunication can also occur as a result of emoticon misinterpretation. Miscommunication can occur when the sender and receiver interpret an emoticon differently. As a result, the volume of communication is reduced or communication breakdown occurs, which may harm relationships (Tigwell & Flatla, 2016).

To avoid the miscommunication, the misinterpretation of emoticon must be reduced. The misinterpretation can be reduced when both sender and receiver possess the same understanding regarding the true meaning of emoticon. One of method for reducing misinterpretation in CMC is by investigating the cultural-based emoticons.

According to CLR done by researcher, very few studies attempted to define how the usage of emoticons can be utilized to represent or express cultures where mostly focus on comparative studies that emphasize cultural differences rather than informing design decisions (Cha, 2007; Karreman & Romeo, 2016; Quintana, 2014). A study by Park, Barash, Fink, and Cha (2013) has investigated the use of emoticons in cultural context, but limit the scope into the style of emoticons usage only, which does not dealt with how emoticons design reflect cultural variations. Despite agreeing that

emoticons have strong uptake and cultural influence, Pohl, Domin, and Rohs (2017) only study on how to minimize the time for user to select the emoticons to be used and how to categorize the emoticons with similar meaning.

Cultural and its consequences in emoticons design to be used in CMC are important, but understudied, causing the concern. Quintana (2014) argued that even though cultural is important element in distributed collective interaction, the study of cultural emoticon is lacking and more research on cultural emoticon should be conducted. Meanwhile Cha (2007) reported that current emoticon design is ambiguous and should be redesign and readdress appropriately to achieve cross-cultural agreement in the design of emoticon.

Likewise, Cha, Tigwell and Flatla (2016) also hold the view that some misunderstanding can be explained by an emoticon being relevant in a specific culture and expect that some cultural variation in emoticon judgement to be present. While Karreman and Romeo (2016) suggested that a more contextual approach to cross-cultural research in HCI can be particularly beneficial for the globalization of GUIs, which usually involves an essential adaptation of an existing interface for a different market.

In addition, an SLR conducted by Tang and Hew (2018) that reviewed on the studies on using emoticon, emoji, and stickers categorized their findings into four major topics, which are communicative functions, contextual impact, general behaviors and motives. The findings show that previous studies of emoticon mostly ignored the role of culture on emoticon so far and is confirmed by the current studies by Feng et al. (2020), Goh and Kulathuramaiyer (2020) and Herring and Dainas (2020).

Therefore, a study of emoticons embedded with a cultural element is required to ensure that a cultural-based emoticon design model can be established, ensuring that the design of emoticons embedded with a cultural element are helpful and effective for the end user in CMC.

1.3 Research Motivation

The research motivation for this study is the limitation of emoticon selection in terms of cultural perspective for countries that are not included in the emoticons designer's countries category. This disparity of culture emoticon representation is most likely due to the fact that emojis originated in Japan and are now maintained in the US by technology companies such as Apple, Facebook, Microsoft, Google, and Adobe (Kimura-Thollander & Kumar, 2019).

Besides that, based on CLR conducted, it is found that there are many studies regarding emoticons but the domain for cultural perspective is less. Besides, with the number of mobile phone and Internet users in Malaysia are increasing year by year, CMC turns crucial among the users. The result gained from the questionnaire also showed that there are demands from extreme users for the development of cultural-based emoticon in Malaysia. Malaysian cultures and practices type of emoticons can be one of the examples upon the demand. The Malaysian culture of emoticons that described the celebration, food, traditional places, and games would contribute onto an immense impact of CMC.

As for Muslim's practices, the praying and fasting practices also included as the culture element where these practices are common among all Muslims. Hence, the

praying emoticon seems to be really helpful for the community to interact with each other in CMC. Whenever a user wants to perform the prayer, the person can use the praying emoticon rather than expressing their intention to pray through a long text message.

The emoticons in CMC have undoubtedly give an ease by helping the user to save more time and avoid the receiver to wait without knowing any idea what is going on while the user is performing the prayer. The most beautiful fact is that the praying emoticon also can be part of element to exclaim and flag the non-Muslim to understand and know more about the religion of Islam.

The implementation of these cultural-based emoticons in CMC not only help in improving the quality of communication, but also contributes to the user's increased understanding of other cultures and of oneself. To be precise, this model is not only restricted for one race or one particular country, but it can be used for other Asian cultures and other Asian countries as well. As for this research, the Malaysia's culture will be the determinant and acts as the leading sample to validate this model. The complete model for cultural-based emoticon is named as Culturicon Design Model (CDM), which Culturicon is merges through the combination of two words: 'culture' and 'icon'.

1.4 Research Question

The study interprets the solution with the following enquiries:

   i.   What are the appropriate principles in designing emoticon?

   ii.   What are the appropriate cultural dimensions in designing emoticon?

iii.   How to design and develop the appropriate Culturicon Design Model?

iv.   How to ensure the validity of Culturicon Design Model?

1.5 Research Objective

The main objective of this research is to propose a new model of cultural-based emoticon design for distributed collective interaction in mobile context. To achieve the aim, the objectives of the study are:

i.   To identify the appropriate principles in designing emoticon.

ii.   To identify the appropriate cultural dimensions in designing emoticon.

iii.   To design and develop Culturicon Design Model for designing the Culturicon.

iv.   To validate the Culturicon Design Model through focus group.

1.6 Research Scope

This study is about developing a model for cultural-based emoticon design for CMC especially in mobile phone. This study focused on the cultural elements that were grouped in the emoticon list, suitable for CMC. As the motivation of this study is to overcome the limited emoticon selection for Asian's culture perspective, the adapted cultural dimensions are based on Asian countries. The developed model was verified by the HCI expert from academic scholars, culture experts, designer, and designer from the industry. The purpose of this verification process is to ensure that the proposed model will be stands in a good quality, while each comment received from these experts were used as the guidelines in improving the quality of the model.

After the model has been verified, a validation process took place by the designer and the end user. Designer performed the validation process by using the model to develop sample of Culturicon as they are the primary user of the model. The sample of Culturicon developed by designers are the output of this model. This study focused on Malaysian's culture as the leading sample of CDM, which represents a thorough utilization upon the three major races in Malaysia which are Malay, Chinese, and Indian. So, the sample of Culturicon developed by designers were embedded with the culture element from these races.

While for validation by end user, end user used the sample of Culturicon developed by designers to validate the output of the model. The validation by end user was performed through focus group discussions. The target participants for the focus group were Malaysian citizen in the group of teenagers. The validation process involved two phases. The first phase involved performing the distributed collective interaction via CMC and using the sample of Culturicon in their communication. The mobile messaging application that was used as the medium of communication for this phase was Telegram. The second phase involved performing focus group discussion to discuss on participant's experience in using the sample of Culturicon.

1.7 Research Significance

This research will bring significance to both bodies of knowledge and practitioner. Once the objectives of this research are achieved, the model for cultural-based emoticon design can be handed to the designer as the guidelines for them to develop a cultural-based emoticon effectively and efficiently.

In terms of theoretical contribution, the CDM will encompass to the field of HCI and related areas. Based on the CLR conducted, there is less and limited study regarding the model which specifies on cultural-based emoticons. This study attempts to develop a new model for cultural-based emoticon design known as CDM as the guidelines for designer to develop new emoticons that are cultural-wise, with the name been given as Culturicon.

This research combined the principles in designing an icon from HCI perspective with the cultural dimension from culture model to form the CDM. Any study that intends to focus on similar dimension, such as a new model of emoticon for other aspects would be able to use this model as guidance in future. Plus, the development of this model can bring into a greater significance to the body of knowledge in HCI under the graphical user interface area.

In term of significance to the practitioner, the result of this research contributes to a new model of CDM. This model was developed to be used by designer in designing and developing the cultural-based emoticon. This model can assist designer by providing the cultural dimensions to be chosen as the core element of the cultural-based emoticon. This model also consists of HCI icon design principle to assist designer in developing an effective and efficient design.

In the future, any designer can use the developed model whenever they want to design and develop the Culturicon, especially from the perspective of Asian countries. The newly developed CDM can be considered as effective and efficient because the model has been verified by expert and validated by designer and end user. With this validated

model, it allows designer to apply the knowledge to build better equipment and interfaces, and a design which users can understand with the shallow learning curve.

The output that was developed by designer based on this model is the Culturicon. This developed Culturicon then can be used by end-user in mobile messaging application. Designer can add the developed Culturicon in mobile messaging application emoticon selection, for example in the Telegram's emoticon and sticker selection. Then, end-user can use it in their communication either by typing the keyword or download the developed Culturicon selection list into their mobile messaging application. Once the Culturicon list was downloaded, it will remain in the end user's selection list for future use.

In terms of cultural perspective, the appropriate cultural dimensions for Asian countries were identified and included in the model. In addition, to better provide information on Asian countries, the cultural dimensions were provided along with their level (e.g., high power distance and high collectivism). By having the appropriate cultural dimensions together with its level, the accurate Culturicon that reflect our culture can be developed. In employing Culturicons that reflect our culture, we are able to create a digital environment that is comprised of our own culture for people to become accustomed to. At first, the newly created Culturicon might be unfamiliar to some users. After some time, the users in the digital environment will get used to it and know the meaning of it.

Just like the emoticon that reflect the Western culture. Some of us do not know the exact meaning of it but after some time we can accept and use it in our daily communication, though there are some of them are misused and misinterpreted. By

19

the development of the CDM, more emoticons for our culture can be developed, hence strengthening our community in the digital environment.

When the digital environment has been strengthened by our community and culture, it can attract the attention from the user especially the elderly people because they can feel comfortable to use the emoticons that they are familiar with. So, the development of the CDM can help to ensure the high acceptance level for people towards the introduction of our culture in digital environment.

In terms of intercultural communication, the way of response gained from a person in any situation is important. Some people may respond with amusement, curiosity, interest, hospitality, fear or anger (Martin & Nakayama, 2010). How people respond to other different culture is based on their personal experiences. For people who are still new in experiencing the spices in intercultural communication, the cultural-based emoticon may provide them with a basic assistance. The Culturicon can be used to ease the intercultural conflict that caused by the lack of knowledge and unintentional acts. The Culturicon also will assist users to gain a better understanding of the cultural aspects of societies.

Through the intercultural communication, not only people learn more about other people and the culture they are bringing, but they also learn more about their own culture (Martin & Nakayama, 2010). A study by Martin and Nakayama (2010) revealed that there are five aspects of significance in understanding the intercultural communication for technology imperative perspective. The aspects are (i) increased information about people and culture, (ii) increased contact with people who are different from us, (iii) increased contact with people who are similar to us who can

20

provide communities support, (iv) identity, culture and technology, and (v) differential access to communication technology.

In the increased information aspects, Internet can provide an easy access to information about other cultures and other peoples instantaneously. By the easy access from the Internet, it could give the user a better knowledge and understanding about other culture. In order to increase the contact of people from different culture aspect, this can happen through the emerging of communication technology that enables the user to connect with the people from different countries and cultures, especially in CMC.

However, there is a drawback of CMC, where it filters out the nonverbal communication's cues that relatively make the communication to be quite difficult as compared to F2F communication. The tone of voice, facial expressions and gestures are the lacking element in CMC. Fortunately, the usage of emoticons has enabled the communication to reach its effectiveness through its capability in solving the problem. That is the reason why the use of Culturicon turns as the crucial ones whenever there is an intercultural communication circumstances appear as a severe conflict.

In order to increase the amount of contact with people who own a similar and mutual interest, everything is possible if the user participates in the chat rooms or discussion board where people with the same culture are interacting. This can be used in order to increase the knowledge of own culture and foster the sense of identity.

In terms of the identity, culture and technology aspects, the modern communication technology has changed the patterns of communication management. Without the

21

physical appearance in online communication technology, people can impersonate as somebody as with different age, gender, and culture in order to go gain deeper understanding about other cultures, and the action can be called as identity tourism. For an example, by taking the virtual identity of a culture and participate in that culture of online discussion, an individual can understand the real feeling of self-belonging of that particular culture, which hence improve their intercultural understanding.

The last aspect would be the accessibility of communication technology. By taking advantage serious understanding upon intercultural communication, the digital division can be reduced. The increment of intercultural communication can also lead to an increase of networked society around the world. People can access any information that cannot be accessed in their own country by grabbing the help from this networked society. The mutual understanding between people with different culture is important in order to form a healthy networked society across continents.

Other benefits of Culturicon that ease the intercultural communication are (i) acquiring knowledge about the world, (ii) breaking stereotypes, and (iii) acquiring new skills. Acquiring knowledge is the process that happens when a relational learning is taking place. Relational learning is the learning that comes from a particular relationship but generalizes to other contexts. Once a person experienced the relational learning, the formation to another intercultural relation would become easier.

Intercultural communication is also capable in breaking stereotypes and ethnocentrism. Many people would judge others who are coming from different culture, by stamping negative perspectives that they heard through the grapevine given by mass media and social media. However, once they form the intercultural

relationship, their opinion diverts to a total change. In order to acquire new skills benefit, people need to have a gut to exchange the information and skills that never been practiced in their own culture. Thus, there is a revelation in which the use of Culturicon is capable to help everyone to exchange the information and skills with others from different cultures whenever they are participating themselves in intercultural communication.

1.8 Theoretical Framework
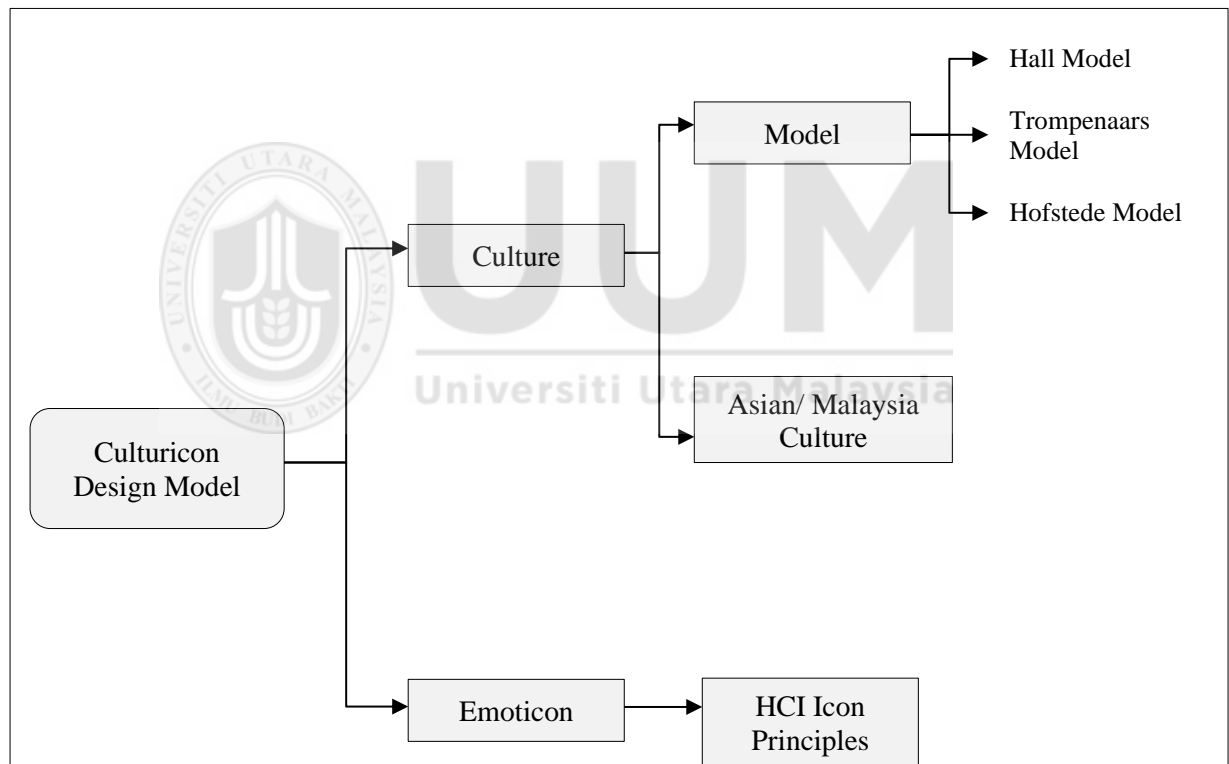
Figure 1.1. Theoretical framework design

Figure 1.1 shows the theoretical framework of this study. As this study aims to design and develop a cultural-based emoticon design model, the domain of this research is the emoticon, while the context is culture. The emoticon is the domain that will be embedded with the element of cultural dimensions that makes up the CDM.

For culture, the dimensions from the Hall culture model, Trompenaars and Hampden culture model, and Hofstede culture model were selected for the development of the Culturicon design model. The selected cultural dimensions were chosen based on previous HCI studies that reported and suggested which dimensions from these culture models are appropriate and suitable for Asian countries (Callahan, 2005; Dormann, 2006; Gould, Zakaria, & Yusof, 2000). As a result, the cultural dimensions of these models were investigated in order to develop the model.

The Hall culture model has ten cultural dimensions (interaction, association, subsistence, bisexuality, territoriality, temporality, learning, play, defense, and exploitation). Trompenaars' culture model has seven cultural dimensions (universalism-particularism, individualism-communitarianism, neutral-emotional, specific-diffuse, achievement-ascription, sequential-synchronic relation to time, and internal-external attitude towards nature). The last culture model, the Hofstede culture model, has six culture dimensions (power distance, uncertainty avoidance, individualism versus collectivism, masculinity versus femininity, long term versus short term orientation, and indulgence versus restraint). Each cultural dimension has their own score according to region/countries. As this study focused on Asian countries, the score for Asian countries were considered. The detail explanations for each dimension from these models were discussed in Section 2.1.2.

For emoticon, as there is no method or model for developing emoticon at this time, the principles of designing icons were chosen to develop the emoticon. The principles of HCI icon design must be investigated because the design of icon for smartphone application and the design for emoticon for use in CMC are not the same. In this study,

12 HCI icon principles were considered (familiar, understandable, attractive, coherent, informative, distinct, unambiguous, memorable, compact, legible, few, and extensible). The detail explanations for each HCI icon principle were discussed in Section 2.1.3.

1.9 Limitation of Study

This study has a number of limitations. As the purpose of this research is to investigate the cultural elements that are lacking in existing emoticon selection, it focuses solely on the culture of Asian countries. This is because, based on current emoticon selection, it has been discovered that the emotion associated with Asian countries' cultures is lacking. As a result, the cultural dimensions of the culture models investigated were based on the levels of Asian countries (High power distance, high collectivism, low uncertainty avoidance, moderate masculinity/femininity, and long-term relationship).

Another limitation is that, despite the fact that this study focuses on Asian countries, the sample of Culturicon developed is based on Malaysian culture only. The culture of Malaysia's three major races, Malay, Chinese, and Indian, was used to develop the sample of Culturicon. As the validation was being done in Malaysia and involved only Malaysian designers and teenagers (end users), the Malaysian culture was chosen for the development of the Culturicon samples.

1.10 Structure of Thesis

This thesis is divided into seven chapters which are:

Chapter One: Introduction

This chapter discusses about the preliminary study on the research background, research problem, research motivation, research question, research objective, research scope, research significance and research framework.

Chapter Two: Literature Review

This chapter discusses about the literature of HCI, issues in CMC, cultural models, icon design, emoticons, distributed collective interaction and the relation of emoticons with CMC and distributed collective interaction.

Chapter Three: Research Methodology

This chapter discusses on the methodology involve throughout the entire research in order to achieve the goal of this research. It starts with the philosophical concept applied in this research and continue to discuss the phases in the research design.

Chapter Four: Culturicon Design Model

This chapter discusses on the development process of CDM starting with the justification of the chosen cultural dimensions and HCI icon principles. Then, the detail explanation on the development of CDM in terms of cultural dimensions and HCI icon principles were explained. After that, the process of model verification by expert review along with the verification results are presented. Finally, the revised version of CDM was explained.

Chapter Five: Validation of the Culturicon Design Model

This chapter describes how the designer, who is the model's user, validates the model. The process of the validation is clearly discussed along with the results of the validation. The sample of Culturicon created by the designers were also presented.

Chapter Six: Focus Group Validation

This chapter discusses on the validation by end user through focus group discussion. There are two phases in this end user validation which are the distributed collective interaction phase and focus group discussion phase. The analysis network was used to discuss the details of the focus group discussions.

Chapter Seven: Discussion, Recommendations and Conclusion

The final chapter draws final conclusions from the research presented throughout the thesis by addressing the research objectives and research findings. Then, the research contribution, recommendation and limitation were also discussed.

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

Literature review chapter is about the past studies related to issues in CMC, culture models in HCI studies, icon design, emoticon and its relation to CMC and distributed collective interaction. This chapter start by explaining the relation of this study with HCI. Then, the issues in CMC were discussed, as well as the culture models applied in previous HCI studies, such as Hall culture model, Trompenaars and Hampden-Turner culture model, and Hofstede culture model. After that, this chapter reviewed past studies on emoticon and its relationship with CMC and distributed collective interaction. This chapter also provides additional evidence for the study's significance by illustrating a gap in the field that this study seeks to fill. Lastly, this chapter discusses on the essential of cultural-based emoticon.

2.1 Human Computer Interaction

HCI is the study regarding communication between human and machines through mutual understanding and exchange of information, achieve to management, service and process the information so that the machines could be useful to human (Bian, Jin, & Zhang, 2010). The Association for Computing Machinery (ACM) defined HCI as the discipline which concerned with design, evaluation, and implementation of interactive computer systems for human use, and the study of major phenomena surrounding them (Hewett et al., 1992).

28

In other words, HCI investigates how user can best interact with the computer. The interaction must involve at least two participants, namely the human and machine. Human refers to the users, operators, managers and people who responsible to run the machine, while machine refers to the machineries, equipment, tools, desktop computer, large-scale computer system, pocket PC, embedded system, software and work environment that associate with the computing technology (Chao, 2009).

The interaction happens when a human is required to perform a specific task by using the machine through the graphical user interface (GUI) of the machine. GUI solves the blank screen problem and usually involves a dialog box where user can control and give feedback to the machine system (Swadner, 1995). So, the purpose of HCI is to help in making the technology easy for people to handle. This is because the sophisticated machines are meaningless unless they can be used properly by human (Karray, Alemzadeh, Saleh, & Arab, 2008).

The design and interface of the system that act as the intermediary communication between human and machine is important in HCI as HCI owns a greater relevance since the technology is pervasive and has a profound effect on lives of all people in all areas, from work to leisure (Ardito, Lanzilotti, Polillo, Spano, & Zancanaro, 2015).

According to Karray et al. (2008), there are two main terms that should be taken into consideration in designing the HCI, which are the functionality and the usability. Functionality is the set of services or actions that the system provides to the user where the functions can properly and fully utilize by user. Usability is the effectiveness of the systems in order to accomplish the user's goal. A good HCI design should have

29

proper balance between the functionality and usability of the system in order to ensure the quality and optimality of the services can be achieved.

Based on this suggestion, in designing and developing CDM, the verification and validation process were conducted. The verification process was conducted to ensure that the components proposed in the model are correct, while the validation process was conducted to ensure that the model is usable to the intended user, which is the designer. During the verification process, expert from the area of HCI, UX, and design checked and verified all the components in the models.

Once the model was verified, it then was validated by the designer who used the model to develop Culturicon. The designer validated the model based on their experience in using the model to develop the model. They determined whether the model is usable to them or not. Then, to ensure that the output of the model (the Culturicon) is applicable in real world, these sample of Culturicon developed by designers were used by end user via CMC. Focus group discussion was conducted to investigate end user's experience in using the sample of Culturicon. By performing these verification and validation process, the two main terms in designing the HCI are fulfilled.

In designing a good HCI design, there are six usability goals of HCI design namely effectiveness, efficiency, safety, utility, learnability and memorability (Sharp, Rogers, & Preece, 2002). Effectiveness refers to the measurement on how good a system is in doing what it supposed to do or the capability of the product in accomplishing its desired goal while carrying out work.

Efficiency refers to the way on how the system supports the users by carrying out their task according to the measurement of the time that is needed in order to accomplish the goal of finishing the work. Safety refers to the design of HCI that is capable to protect the user from any hazardous outcomes and unwanted situations whenever the product is being used.

Utility refers to the extent to which the system provides the right kind of functionality that allows the users to do what they need and want to do with the product. For learnability, it refers to the convenience and easiness for user to learn on how to use the product. User would not be willing to spend much time to learn on how to use the product, as they would want to get started straight away and become competent in carrying out tasks with less effort.

Last goal is memorability which refers to how easy to remember on how to use a product once learned. If users have not used a system or an operation for a few months or longer, they should be able to remember or at least rapidly be reminded how to use it. Users should not have to keep relearning whenever they require to carry out tasks in the future time.

These goals are agreed by Bian et al. (2010) in their study, by stating the principles in the HCI design are based on cognitive psychology. Bian et al. (2010) added an extra goal which is an interaction that should bring the emotional of happiness among users. They discussed that the design should be esthetic, enjoyable, and friendly. To be precise, esthetic defines a design that followed the basic art principles of the color, icon and text used.

Meanwhile, enjoyable, and friendly signify a design as should be capable to overcome what the traditional design is lacking in creating more attractive output. In order to ensure that all these goals can be accomplished, HCI specialist need to understand the factors that determine how people operate and make use of computer technology such as the organizational, social and psychological factors (Sharp et al., 2002). They are also responsible to develop tools and techniques that help designers to ensure the suitability of computer systems for users' activities.

The same thing applied in designing emoticons where the designer should have an appropriate model to design it. Most of previous studies provide guideline in designing icon for desktop and mobile phone, but not the guideline for the emoticon to be used in mobile messaging application. This study seeks to add the guideline for emoticon. As for this research, the proposed cultural-based emoticon design model can assist designer to develop the suitable and meaningful cultural emoticons for the user to use in CMC. This research belongs under the category of GUI in HCI. This is because icon is one of the components for GUI. So, the development of Culturicon, which is also an icon belong under the category of GUI.

Furthermore, the relation of HCI study with this research is the component of the interaction in HCI. The components are the expression, gesture and behavior interaction (Bian et al., 2010). This interaction is the new achievement of the modern HCI where the system able to process the type of human expression, gesture, and behavior, hence producing the relevant output according to the user's expression, gesture, and behavior. This research embedded the culture element in the expression, gesture, and behavior through the use of emoticon. By embedding the culture as the

32

element of the emoticon, the design process of the emoticon must fulfill principles is HCI design. Therefore, emoticons can be used as the tools to represent expression, gesture, and behavior, and thus become the component of the interaction in HCI.

2.1.1 Issues in Computer Mediated Communication

The history for Computer Mediated Communication (CMC) start during mid-1980s, with the purpose for deaf education at Gallaudet University (Ho, 2009). Due to its successful utilization, CMC now has become the global communication where distance is not the limit for communication. People do not have to meet F2F anymore to have a communication. They can communicate anytime and anywhere by using the CMC, as long as the Internet connection is available.

According to Herring (as mentioned in Cameron and Panović (2017)), CMC is the communication that occurs when humans interact with one another by sending messages via networked computers. Networked computers include a computer and a mobile phone as tools. Previously, user used computer to perform CMC as it was the only device that can be connected via Internet network. Nowadays, CMC has been used in mobile phone widely as it can carry the Internet wirelessly. The examples of CMC are email, instant messaging, chatting, and video conferencing.

In performing CMC, there are two forms of communication in namely synchronous and asynchronous (Baron, 2005). The synchronous communication is real-time communication that occurs either through one-to-one or many-to-many communication, whereas the asynchronous communication is the exchange of

33

messages among participants by reading and responding as schedules allow rather than according to clocks that are synchronised for real-time communication.

The synchronous communication is CMC that can be performed using applications such as Telegram, WhatsApp, Messenger, and many others that allow real-time communication. The communication process is also faster than in asynchronous mode, as the user can respond to the message quickly and the sender can determine whether the receiver has read the message or not. Meanwhile, asynchronous communication is CMC that can be done via email. Email communication is slower than synchronous communication, and the sender has no way of knowing whether the recipient has read the message or not. Typically, users prefer synchronous communication for faster and more informal communication.

By using CMC, people can perform group discussion or online meeting remotely and inter-culturally where the participants are dispersed geographically (H. C. Wang et al., 2009). With these technologies, user can save the time and cost, rather than to commit and perform the F2F meeting. When CMC is used as the platform for virtual community especially for teenagers, where there is a high possibility to encounter the people from other cultures, they need to learn and develop the skill in order to cope and adapt with this situation (Cheng & González, 2013). People from other cultures may come with different behaviors, styles, and perspectives of communicating, which require the user to consider the intercultural sensitivity while utilising CMC.

Despite providing numerous benefits to users, CMC also has a shortcoming. The shortcoming of CMC is the misunderstanding in interpreting the exact meaning of a message across cultures. Based on a study conducted by Nguyen and Fussell (2013)

on the cognitive and affective process in intercultural CMC, the participants claimed that it is difficult to understand message of participants from other cultures. Ruan (2011) in his study stated that CMC is lacking the facial expression and body language which are vital in expressing personal opinions and attitudes. Unlike F2F communication, CMC is lacks with the cues of nonverbal communication (Lo, 2008). This problem then led to negative affective reactions and the communication seems to be abrupt or rude. As the matter of these negative affective reactions, the participants tend to reduce their engagement in intercultural conversations.

Based on the stated problem, the researcher makes conclusion that the content of sender's messages may influenced the reeciver's involvement and emotions during the conversations. This conclusion is also supported by He and Huang (2014), where they claimed that emotional expression varies greatly between cultures and can wreak a significant havoc in multicultural teams.

In order to reduce the volume of misunderstanding of the content of the message whether between different cultures or within the same culture, there is a need for a representation or symbol that can assist user to better understand the message, by which this study proposed the new development of cultural-based emoticon design model, Culturicon Design Model.

2.1.2 The Application of Culture Models in Human-Computer Interaction Studies

This section discusses on how culture has been approached by HCI community and the used of culture models in HCI studies. Culture models have been applied in HCI

over various ways as culture is important in HCI studies (Dhaundiyal, Chakravarty, & Joshi, 2020).

Among the existing culture models from other disciplines that have been applied in HCI research includes Hall culture model, Trompenaars and Hampden culture model, and Hofstede culture model (Balan & Vreja, 2013; Ishak & Jaafar, 2016; Oshlyansky, 2007). These models are discussed in next section. Each of these models possess their own dimensions where some of the dimensions are same with others and vice versa, which propose the different way of understanding the differences in every culture.

Among the study that used these culture model in HCI is a study conducted by Gould, Zakaria and Yusof (2000). Their study used two dimensions from Hofstede culture model (power distance and individualism-collectivism), and a dimension from Trompenaars and Hampden culture model (specific relationship) in comparison of representative's websites. They used these dimensions in their study to structure the differences they found between the cultures in Malaysia and United States during the usage of websites, where these two cultures own their different ways of interacting and priorities.

On the other hand, a study by Callahan (2005) analyzed university's websites from eight different countries by using Hofstede culture model. He studied the layout design, type and frequency of images and number of links per page of the university websites. Results show that there are correlations of logo image usage with high power distance dimensions and figurative images usage with masculinity dimensions.

The masculinity dimension was also used in a study by Dormann (2006). This dimension was used in overlooking the different emotions and values expressed on university website from three countries. The results showed that the feminine countries strongly expressed the feminine values as described in the Hofstede culture model.

According to Abubakari, Wang, and Paa-Grant (2018) and Dhaundiyal et al. (2020), the most widely used cultural model in cross cultural research is Hofstede culture model. This is because Hofstede culture model is the upgraded version for Hall culture model where Hall previously called for a model that is more useable and applicable for people outside from the anthropology's field and Hofstede managed to fulfill it. Another reason for its popularity is because of the simplicity of the model itself.

Besides that, Hofstede's cultural dimensions are widely used because he studied 74 countries and the scores assigned to each are reliable (Ishak & Jaafar, 2016). Because of this, many interface researcher have used Hofstede's cultural dimension in their studies.

According to Hoft (1996), culture models can be applied to: i) identify information that is cross-culturally appropriate; ii) identify cross-cultural bias by applying the models to designer's own culture; iii) identify effective metaphors; iv) assess the degree of localization that will be necessary; v) avoid cross-cultural mistakes which can cause offence; and vi) evaluate how suitable an international interface is. Culture models also can be used as a framework or design guidelines. Culture models can be applied as a tool to assess and evaluate design or guideline and the applicability of the models.

Suggestions in ii) and iv) are relevant and in line with the purpose of this research, which is to provide design guidelines for emoticons for Asian countries. In order to do so, the suggested culture models must be investigated. Among the culture models mentioned in HCI research, those of Hall, Trompenaars, and Hofstede culture model are discussed in the section below.

2.1.2.1 Hall Culture Model

There are several culture models that have been applied in HCI. One of the models is by Hall (1959). Hall defined culture as a set of learned and shared behaviors as well as the way that a people communicate, understand, and relate to each other and to the world. In other word, culture is a form of communication that is so deep when people tend to not have realization about the culture.

Hall developed the theory of culture that was named as Primary Message System (PMS). The PMS makes up human activity that is based on two elements which are the non-lingual forms of communication and biological. Hall stated that in order to understand a particular culture, one must understand how culture is closely related to the PMS. There are 10 aspects of PMS where each of the aspects refers to human activity and how it constructs culture. The aspects are: i) interaction, ii) association, iii) subsistence, iv) bisexuality, v) territoriality, vi) temporality, vii) learning, viii) play, ix) defense and x) exploitation.

The first aspect is interaction (Hall, 1990). According to Hall, interaction is the primary of element for every culture. Everything that grows from the interaction is because of the interaction activity. Interaction also can be described as the specific

relationship that exists between people and their surroundings (Piccolo & Pereira, 2019). Based on this, it can be said that interaction is the source of culture's development. This is due to the fact that an interaction requires more than one person. Thus, it led to the second aspect, association.

The second aspect is association (Hall, 1990). Association happened when there is interaction between people and groups. Association is the way societies are structured and organized. The culture began to emerge as a result of association. This is due to the fact that each member of the association has a role that must be put together to form a society.

The third aspect is subsistence (Hall, 1990). Subsistence refers to foods, characteristics of economy, work status and the values placed on work. In other words, subsistence refers to how an association's members survive, from individual food habits to the economy of a country (Piccolo & Pereira, 2019). Food is necessary for both energy and survival. To be able to eat, that person must earn money by working. The work status determined their social class and its place in society. This chain of work is what constitutes a country's economy.

The fourth aspect is bisexuality (Hall, 1990). Hall states that bisexuality refers to the concepts of masculinity and femininity, and what is considered appropriate for male and female behavior. It is a set of social norms that dictate norms, behaviors, attitudes, and activities that are then considered appropriate for members of that group. Different gender may have a different role in each social norms mentioned.

The fifth aspect named territoriality is the relationship to possessions as well as the use and defense of territory (Hall, 1990). Example of territory is home. Every member of society requires a place to live and protection from potential disasters. By having a home, that person will learn how to live in a territory populated by other people that form a society. Human territoriality is highly developed and strongly influenced by culture (Hall & Hall, 1990).

The sixth aspect is temporality that refers to the cycles and rhythm of life and the importance placed on time (Hall, 1990). It is the way in which all aspects of culture relate to time, including the past, present, and future. For example, the time for social interaction, time to do daily activities, and time to work.

The seventh aspect called learning is about an adaptive device which varies from culture to culture, which significantly allows the learning process through different ways between various cultures (Hall, 1990). Because there are many aspects of culture in a society, in order to adapt, a person must learn and acquire knowledge about their surroundings.

Learning also can be described as the process by which knowledge is transmitted from a biological source to formal and informal learning processes (Piccolo & Pereira, 2019). This means that the family's heir learned about culture from their ancestor, either directly or through action.

The eighth aspect which is play (Hall, 1990). It relates to the humor and jokes, and a strong link to learning. In order to socialize, play is one of the ways. Playing can help to build relationships within a society because playing involves with the aspects of

joy, competition, and affection (Piccolo & Pereira, 2019). There are traditional games designed for this purpose. As time passed, modern games were developed in response to temporal aspects.

The ninth aspect which is defense (Hall, 1990). This aspect is about the action taken to survive any obstacles and threats. It is related to territoriality because when we own something, we must defend it against any threat. Defense can also apply to religion, war, medicine, and law, which are all considered defense devices (Piccolo & Pereira, 2019).

Lastly, the exploitation is the use of environment and public extension of self into the environment (Hall, 1990). It is the adaptation of the person to take advantage of available resources in their surroundings. Exploitation is capable to create new jobs or responsibilities within a society, thereby creating new cycles.

In addition, Hall added two more cultural concepts, High Context (HC) and Low Context (LC), which are more commonly used in HCI studies than PMS aspects (Hall, 1990). These concepts are concerned with message storage and delivery, or, in other words, with describing the differences in human communication styles (Condon, 2015). The information in the message is implicit and basic in HC cultures, yet it has a lot of meaning. This means that there is a less information in the verbal message and more in the context of nonverbal communication such as the tone of voice, gesture, facial expressions, and eye contact.

Meanwhile, in LC culture, the message's information is explicit, and the meaning is encoded in the message's code. This means that most of the information is in verbal

message and less in the context (Condon, 2015). Based on this, Westerners have an LC culture, whereas Easterners have an HC culture (Hall, 1990). These ideas have been used in HCI to explain design variation and provide reasons for communication pattern discrepancies.

2.1.2.2 Trompenaars and Hampden-Turner Culture Model

Another culture model is by Trompenaars and Hampden-Turner (1997) that defined the seven dimensions of culture in their book, Riding the Waves of Culture. According to Trompenaars and Hampden-Turner, culture is a shared definition of a situation by a group. The shared meaning, beliefs and mutual dependence makes up the connected system of the group. They also stated that culture has three layers which are described as Figure 2.1 below.
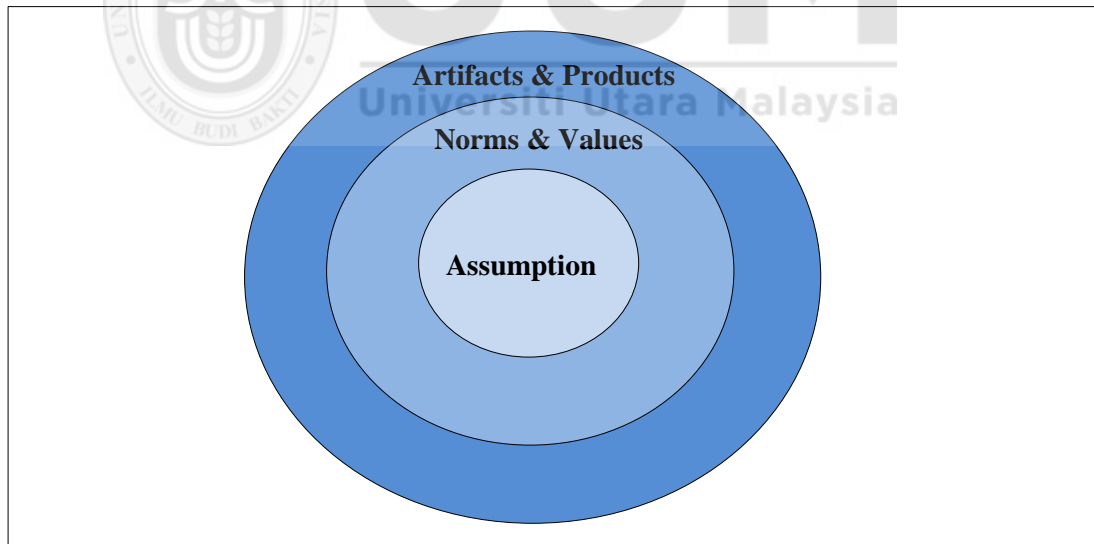
Figure 2.1. Trompenaars & Hampden-Turner Culture Model (retrieved from Trompenaars & Hampden-Turner, (1997))

In the outer layer, it consists of artifacts and products. This layer consists of explicit culture too. They stated that the explicit culture is the observable reality of the

42

language, food, buildings, houses, monuments and so on that act as symbols of a culture. This symbol result to the first impression and judgment of a stranger towards the culture.

The middle layer contains norms and values in which the reflection from the implicit culture. Norms is the mutual sense in the group of what is 'right' and 'wrong', while the values determine what is 'good' and 'bad'. Norms are like the laws and social control of the community. Meanwhile, the core layer contains the assumptions. Assumption is about how to organize life and people to solve the problems of survival geographically. These three layers influence the behaviors and actions of the people in the culture.

Trompenaars and Hampden-Turner (1997) defined their seven dimensions of culture to show that cultures are varies based on the large data set gained from their workshop and research. The seven dimensions are: i) universalism-particularism, ii) individualism-communitarianism, iii) neutral-emotional, iv) specific-diffuse, v) achievement-ascription, vi) sequential-synchronic relation to time and vii) internal-external attitude towards nature.

The first dimension, which is the universalism-particularism is about how people define other's people behavior (Trompenaars & Hampden-Turner, 1997). Universalism, or rule-based is a view that there is a rule in social life and every human fall into the same equality under the rule. In other word, People in universalistic cultures generally adhere to universally agreed-upon standards, and their relationships are governed by laws, rules, general values, and obligations(Balan & Vreja, 2013). If

a person started to disobey the rule, the society system will collapse. Canada, USA, and Switzerland are examples of countries with universalist cultures.

On the other hand, particularism is the actions that were influenced by the relationship of a person without the restriction of the rule. This means that personal relationships always take precedence over universal rules and laws (Balan & Vreja, 2013). Besides that, people's behavior is determined by their specific obligations to the people they know in person. Particularist countries include India, China, Russia.

The second dimension is individualism-communitarianism (Trompenaars & Hampden-Turner, 1997). This dimension is regarding on how people relate to one another, together with what the people want as an individual and as a group. According to Trompenaars and Hampden-Turner (1997), individualism can be described as a prime orientation to the self and the individual is thought to be more important than the group. People value personal freedom and initiative, as well as individual decision-making and responsibility, and they recognise and reward personal achievement (Balan & Vreja, 2013). They have an unsteady relationship because they value themselves more than anyone else. Among the countries with individualist culture are Israel, Canda, USA, and Romania.

While communitarianism is a prime orientation to common goals and mutual objectives. For communitarian, the group is regarded as more important than the individual because, in exchange for the individual's loyalty, it provides him with safety and assistance when required (Balan & Vreja, 2013). Communitarian valued the group more than personal freedom and independence. The relationship between them is

44

strong as the result of loyalty to each other. India, Egypt, and Mexico are among the countries with communitarian culture.

The third dimension is neutral-emotional (Trompenaars & Hampden-Turner, 1997). Neutral is the relationship approach that focuses on objective. This means that people with neutral culture must maintain their emotional control and make actions based on the reason rather than emotion. In other words, they cannot let their feeling interfere with the action they make. German, Finland, Netherland, and Sweden are among the countries with neutral culture.

Meanwhile, the emotional culture is the relationship approach that focuses more on human relationship and inappropriate emotional expression (Balan & Vreja, 2013). Contrasting with neutral culture, emotional culture allows their emotions to take control over their actions. This means that every decision made are based on their spontaneously feelings. They clearly express their body language as it relates to their emotions. Among the countries with emotional culture are France, Spain, Italy, and Poland.

The fourth dimension is specific-diffuse (Trompenaars & Hampden-Turner, 1997). Specific is the relationship approach that is limited by contracts and strictly agreed business relationship. People in a specific oriented culture believe that their lives are a sum of parts that should be kept separate (Balan & Vreja, 2013). Because of this, as people have their professional and personal aspects of lives, both must be kept separate. This means that they can performed their professional work even though they do not have a good relationship with their co-worker. The countries with specific culture are Netherland, Sweden, Denmark, Germany, USA, and Switzerland.

45

Meanwhile, the diffuse culture is the relationship approach that is built by personal contact to get to know the people who involved in the relationship (Balan & Vreja, 2013). This means that their professional and personal aspects of lives are relates to each other. They believed that in order to achieve greater success, coworker relationships were crucial. Russian, India, Spain, China, and Argentina are among the countries with diffuse culture.

The fifth dimension is achievement-ascription (Trompenaars & Hampden-Turner, 1997). The achievement culture is the status of a person that is built based on experience and triumphant. This means that their social and professional status are recognized based on their achievement. Their society also values and rewards appropriately, in accordance with their efforts to achieve success. The countries with achievement culture are Denmark, Sweden, Canada, USA, and Australia.

In contrast, the ascription culture is the status of a person that is assigned and based on connection or birth right (Balan & Vreja, 2013). This means that this culture is based on who a person is rather than what he or she has done or does. The society do not regard much on that person's achievement in giving rewards and recognition. Italy, France, and Japan are among the countries with ascription culture.

The sixth dimension is sequential-synchronic relation to time (Trompenaars & Hampden-Turner, 1997). In sequential time culture, people tend to understand the structure of time as sequential and capable to set the value different importance of past, present, and future (Balan & Vreja, 2013). People from this culture place a high value on the order in which events occur, implying that they place a high value on

46

time, punctuality, planning, and adhering to a schedule. UK, USA, and Germany are among the countries with this culture.

Meanwhile, in synchronic time culture, people see the past, present and future as interlocked and flexible periods that enable them to work multitasking at once with well flexible commitments. In contrast to sequential, people in this culture treat time flexibly, allowing them to work on multiple projects at the same time as planning and schedule are not that important. Countries with this culture are Mexico and Argentina.

The last dimension is internal-external attitude towards nature (Trompenaars & Hampden-Turner, 1997). This culture is concerned with the extent to which people believe they have control over their environment or are controlled by it (Balan & Vreja, 2013). For internal culture, people believe that nature is a complex mechanism but can be controlled by the right person with expertise in nature. This means that knowledge of nature is important and should be handled by someone who is knowledgeable about it. According to Balan and Vreja (2013), this culture can be relate to human too. The way we treat nature is the reflection of how we treat human. This culture is especially important when working in a team or organisation.

For external culture, people believe that they have to adapt with the nature and environment in order to achieve goals. Relating with relationship with human, Balan and Vreja (2013) stated that people from this culture should avoid conflict and focus their actions on others especially in workplace.

2.1.2.3 Hofstede Culture Model

According to Hofstede (2011), culture can be defined as the collective programming of mind that distinguishes the members of one group or category of people from others. The programming includes patterns of thinking, feeling and potential activity. Culture is a collective phenomenon that can be connected to different collectives, where within the collectives there is a variety of individuals. The term culture is usually referred to as tribes or ethnic groups, nations, and organizations. Culture also can be practiced in genders, generations, or social classes.

The learning process of culture are based from the people's experience in life (Hofstede, 2011). It started from the family living practice where the children learnt from their parent at home. Then, they are taught by their teachers in school and by interaction among their friends. This chronology of life is similar to Hofstede ideology, which is about the "culture is the collective programming of mind", where the young person follows the programming set of old person in the same culture.

Hofstede elaborates that culture is not acquired in a short period of time, but rather develops over time through a stratified process of generating symbols, modelling heroes, partaking in rituals, and, eventually, evolving values and value systems (Dhaundiyal et al., 2020). These intangible cultural elements are materialised by family, school, religion, work, friends, mass media, and a plethora of other factors in our environment. Based on these, the culture can be categorized according to national, social norm, political, religion, work, education, and family (Karreman & Romeo, 2016).

Hofstede's dimensions of culture are based on the large sample of employees from IBM that he studied during the 1960s, 1970s and 1980s. The dimensions formulated from the IBM datasets that were confirmed with other sources that formed six dimensions namely: i) power distance, ii) uncertainty avoidance, iii) individualism versus collectivism, iv) masculinity versus femininity, v) long term versus short term orientation, and vi) indulgence versus restraint.

The first dimension, which is power distance, is related to the different solutions to the basic problem of human inequality (Hofstede, 2011). According to Hofstede, power distance has been defined as the extent to which the less powerful members of organizations and institutions accept and expect that power as to be distributed unequally. These inequalities in power are the fundamental facts in society where there are small power distance and large power distance.

In small power distance, management hierarchies are flatter and liberal to questioning, rather than large power distance where everyone has the same power in decision making. In large power distance, the decisions making are centralized by the management and superiors who are highly respected. Asian, Indian, and African are among the country with high power distance, while Scandinavian and German are among the country with low power distance (Heimgärtner, 2017).

As this study focused on Asian countries which reflect the high power distance, the relation for high power distance with GUI according to Karreman and Romeo (2016) are linear navigation, structured data, little information at first level, and images show people in their daily activities. The relation of images show people in their daily activities is relevant to the objective of this research, which is to express the culture.

In high power distance, it is important to show the image of people that is doing the culture activities. By showing the image of people, it reflects the authority and distribution of power in the society. These relations were considered in the development of CDM.

The second dimension is uncertainty avoidance. Uncertainty avoidance is the extent to which the members of the cultural programs cope with anxiety by minimizing uncertainty, either to feel comfortable or uncomfortable in unstructured situations (Hofstede, 2011). Unstructured situation is the unusual, surprising, and unexpected situations that the person faced. In order to minimize these unstructured situations, uncertainty avoidance employed strict behavioral codes, laws and rules.

There are two types of uncertainty avoidance, which are strong uncertainty avoidance and weak uncertainty avoidance. Strong uncertainty avoidance defined rules of behavior and formality strictly and view things that are different and unexplained as dangerous. The weak uncertainty avoidance is the willingness to take the risks and had more experimentation and innovative behavior. According to Heimgärtner (2017), countries that reflect strong uncertainty avoidance are Finland, German, Greece, Guatemala, Mexico, and Portugal. Meanwhile, the countries with low uncertainty avoidance are Asian, Denmark, Sweden, and Ireland.

Focusing on Asian countries, the relation of low uncertainty avoidance with GUI are most information at interface level, and code color to maximize information (Karreman & Romeo, 2016). Based on this, it shows that the utilization of color plays an important role in design to show the most information especially at interface level. These relations were considered in CDM.

The third dimension is individualism versus collectivism. Individualism in this dimension is not about the individual characteristics, but more on how the individual in the society defines the person as part of a larger group (Hofstede, 2011). This dimensions also refers to the degree of interdependence maintained among society's members (Karreman & Romeo, 2016).

There are two categories for this dimension, which are high individualism and high collectivism. For high individualism, the ties between individuals are loose and everyone is supposed to take care of him and his family. For high collectivism, individuals are strongly incorporated into groups of family that continue to protect them in exchange for loyalty. Among the countries with high individualism are Sweden, Denmark, USA, Australia, and German, while the countries with high collectivism are Asian, African, and Mexico (Heimgärtner, 2017).

As Asian countries reflect the high collectivism, the relation with GUI are traditional colors and images, high multimodal, and colorful interface (Karreman & Romeo, 2016). These relationships are very similar to the relation in low uncertainty avoidance, which emphasises the use of colors. Furthermore, this dimension is related to high multimodality, which means that there can be many designs to show the culture element. This is due to the characteristics of collectivistic society, in which there are many activities based on collectivism such as games, agriculture, culinary, and outfit. These relationships were considered in CDM.

The fourth dimension is masculinity versus femininity, which refers to the distribution of values between the genders that is considers as fundamental issue in society (Hofstede, 2011). The two categories for this dimension are high masculinity and high

femininity. High masculinity favors assertiveness and emphasis on competition, while high femininity focused on quality of life and importance placed on well-being relationships (Dhaundiyal et al., 2020).

Besides that, high masculinity society signifies a social preference for achievement, heroism, assertiveness, and material rewards for success, which encourages competition. In contrast, high femininity society defines a cooperative, modest, nurturing society that values consensus. Among the country with high masculinity society are German and Japan, while the country with high femininity are Norway and Sweden (Heimgärtner, 2017). Asian and African countries reflect moderate masculinity and femininity.

The relation for moderate masculinity and femininity with GUI are the balance use of color between pastel color and bright color, and friendly communication with user, and use encouraging words to communicate (Karreman & Romeo, 2016). Because pastel colors appear feminine and bright colors appear masculine, the use of color must be balanced, which means it cannot be overly pastel or overly bright. Besides that, the design also must be friendly and harmony to show the good side of the culture.

The fifth dimension which is long term versus short term orientation is the extent to which the society focuses on the future as opposed to the past and present (Hofstede, 2011). This dimension is an indication of whether one's view on life is more concerned with the present or the future.

The two categories for this dimension would be long-term orientation which promotes virtues and persistence and focus on future rewards, while short-term orientation

emphasizes the past and present and fosters a respect for tradition. Asian countries are the countries with long-term orientation while African, Denmark, Sweden, and German are among the countries with short-term orientation (Heimgärtner, 2017).

The relation of long-term countries with GUI are most information at interface level and content can be arranged around a focal area (Karreman & Romeo, 2016). Based on this, the design interface must provide most information especially in the focal area.

The last dimension for Hofstede culture model is indulgence versus restraint which is complementary with the fifth dimension (Hofstede, 2011). Indulgence is the state where the society allows relatively free gratification of basic and natural human desires related to enjoying life and have fun, while restraints is the state where the society controls the gratification of needs and regulates it by means of strict social norms.

Among the countries that reflect indulgence are South and North America, Western Europe, and African, while countries that reflect restraint are Asian and Eastern Europe (Hofstede, 2011). Because this dimension is a continuation of the fifth dimension, there hasn't been much research into how it relates to GUI design.

2.1.2.4 Comparison of the Culture Models

Based on the previous cultural models, there are conceptually similar dimension between those three models (Sidi-Ali, 2019). These similarities are classified according to classification of relationship between people, possession/power in society, importance of time, reaction to law, attitude towards nature, difference in gender, survival, adaptation learning, humorous in learning, interaction with people,

relationship approach, emotional relationship, and freedom of life. These similarity classifications between these 3 models are discussed. The similarities are presented in Table 2.1.

Table 2.1

Similarity classification between three culture models

Classification	Hall	Trompenaars & Hampden	Hofstede
Relationship between people	Association	Individualism - communitarianism	Individualism vs collectivism
Possession/ power in society	Territoriality	Achievement - ascription	Power distance
Importance of time	Temporality	Sequential - synchronic relation to time	Long term vs short term orientation
Reaction to law	Defense	Universalism - particularism	Uncertainty avoidance
Attitude towards nature	Exploitation	Internal – external attitude towards nature	-
Difference in gender	Bisexuality	-	Masculinity vs femininity
Survival	Subsistence	-	-
Adaptation learning	Learning	-	-
Humorous/jokes in learning	Play	-	-
Interaction with people	Interaction	-	-
Relationship approach	-	Specific - diffuse	-

Table 2.1 continued			
Emotional relationship	-	Neutral - emotional	-
Freedom of life	-	-	Indulgence vs restraint

As shown in Table 2.1, there are four classifications that have similar cultural dimension for those three models (relationship between people, possession or power in society, the importance of time and reaction to law). For the relationship between people, the similar dimensions are the association by Hall culture model, individualism – communitarianism by Trompenaars and Hampden culture model, and individualism vs collectivism by Hofstede culture model. These dimensions are about the way the societies are structured and organized, either by individual or by group, and how they define themselves as a part of the societies.

For the possession or power in society, the similar dimensions are territoriality by Hall culture model, achievement– ascription by Trompenaars and Hampden culture model, and power distance by Hofstede culture model. These dimensions are about the usage of power in societies, how they got the power, and how people react to the power.

For the importance of time classification, the similar dimensions are temporality by Hall culture model, sequential–synchronic relation to time by Trompenaars and Hampden culture model, *and long-term vs short-term orientation* by Hofstede culture model. These dimensions are about how people value the importance of culture in past, present and future.

The last classification that has similar dimensions between those three models is reaction to law that comprises of defense by Hall culture model, universalism-particularism by Trompenaars and Hampden culture model, and uncertainty avoidance by Hofstede culture model. These dimensions emphasize on how people adapted themselves in society system that have rules and laws. If they did not follow the laws, the society may collapse.

There are also two classifications that have similar dimension between two of the models (attitude towards nature and the difference in gender). For the attitude towards nature, the similar dimensions are *exploitation* by Hall culture model and internal-external attitude towards nature by Trompenaars and Hampden culture model. These dimensions are about how people or society get used of the environment and adapt with the nature to achieve life's goals.

The last similar classification is difference in gender which comprise of bisexuality by Hall culture model and masculinity vs femininity by Hofstede culture model. These dimensions are collectively about the consideration of the appropriate behavior for male and female in society, which is the fundamental issue in culture.

Based on the previous studies, these models have been used for HCI in investigating the user's interaction with the websites. It would be interesting to look into these models in terms of mobile messaging applications. In doing so, this study chose the appropriate cultural dimensions from these models for Asian countries to be used in the development of cultural-based emoticon design model. As mentioned in Section 2.1.2, this research used the cultural dimension by Hofstede due to the reasons that

have been discussed. The relation of the selected cultural dimensions and its justification are discussed in Section 4.1.1.

2.1.3 Icon Design Principles

According to Kaneko, Ikemoto and Kusui (1991), icon can be defined as a pictograph which represents an object that intuitively convey its function to user. In designing icon, several researches have explained the characteristics needed in designing an effective icon. Kurniawan (2000) reported that in designing an icon, there are two rules of thumb that need to be followed which are icon has to be recognizable by the user and icon designed has to be physically and perceptually distinguishable from other icons in the set. This implies that the icon's design should be familiar to the user. Besides that, to avoid redundant design, the designs must be distinct from one another.

In designing an icon, Horton (1997) suggested twelve principles which are: i) understandable, ii) unambiguous, iii) informative, iv) distinct, v) memorable, vi) coherent, vii) familiar, viii) legible, ix) few, x) compact, xi) attractive, and xii) extensible.

For first principle, understandable principles means that the icon spontaneously suggests the intended concept to the user (Horton, 1997). Several studies agreed with the understandable principle in designing icon (Chen, 2003; Chiu, Koong, & Fan, 2012; Islam, 2016; Lan, Jianjun, & Qizhi, 2013). Chen (2003) stated that most of the icon created are designer-oriented, which mean that the icons were designed based on designer preferences and not from user preferences. This result to some of the icons are not understandable by the user that make them confuse on the functions of the icon. To make it understandable, designer must ensure that the icon designed able to send

57

both visual and conceptual cues to the user that help the user to recognize and understand the icon (Chiu et al., 2012; Islam, 2016; Lan et al., 2013).

For second principle, ambiguous means that the design of the icon associated with just one concept so that the user will not confuse of the icon concept with other concepts (Horton, 1997). If possible, designers are advice to add more cues to resolve the ambiguity issue. This principle is important to ensure that end users' interpretations match the designer's assigned meaning in order to perform the desired tasks or obtain the desired information accurately (Islam, 2016). Having said this, the meaning of the design must be clear and straightforward to its intended meaning.

For third principle, informative means the icon designed are able to accomplish the user's need. Similarly, Chiu (2012) mentioned that the icon is considered informative if the user knows the meaning of the icon and used it correctly. As for this research, the developed Culturicon are used in CMC, for the purpose of communication. If the end user can correctly use the Culturicon to express their cultural intention during the communication, the Culturicon design can be considered informative. It not only expresses the meaning of the Culturicon, but it also strengthens the message.

For fourth principle, distinct means that the icon designed are differ with other icon designed especially with icon from different concept (Horton, 1997). Kurniawan (2000) explained that the icon designed must be perceptually distinguishable as the icon is not designed to operate in isolation. It will be among or grouped with other icons set. So, to avoid any confusion and misuse, the design must be distinct (Islam, 2016).

As for this research, the developed Culturicon are based on the cultural dimensions discussed in previous chapter. The design will belong into categories according to the intended cultural dimensions selected to be the element of the Culturicon. For example, under category of social norm in high collectivism dimension, there are traditional games and agricultures. In doing so, the design must be distinct so that its category is clearly defined.

For fifth principle, memorable means that the icon designed to be easily memorized by the user whenever they want to use it in the future effortlessly (Horton, 1997). This principle is related with understandable principle because if the icon designed can be easily understand by user, it also can be easily memorize by the user (Chiu et al., 2012). For this research, the design will be sorted according to their cultural dimensions. This is to ensure that user know where there are located within the Culturicon list.

For sixth principle, coherent principle means that the icon designed consistent with its associate and unified icon (Horton, 1997). The icon designed must be clear where one icon end and another begins. Lan et al. (2013) stated that the basic principle of icon design is the set of unified icon because the overall design has more quality than the scattered design. So, to have a quality set of icon, the design should be coherent and logic. For example, the Culturicon of tribe family in this research should clearly design who is the father, mother, son, daughter, and so on. These tribe family designs must be coherent.

For seventh principle, familiar means that the icon designed are familiar to the user where the user effortlessly recognize the design. Kurniawan (2000) mentioned in her

study that the icon must be familiar so that users are able to recognize what the element in the icon are physically and perceptually. Several previous studies also agreed that the design of an icon should be the one that are familiar with the user (Chen, 2003; Chiu et al., 2012; Islam, 2016; Lan et al., 2013).

As for this research, the element of Culturicon is the culture itself. This means that the culture must be familiar to the intended user, expressed in the form of Culturicon. That is why it is important to determine the level of the cultural dimension of the country so that the familiar culture element can be designed.

For eight principle, legible is about whether the icon designed is readable or not regarding its color (Horton, 1997). Things that need to be considered is the color between the foreground and background. Designers need to ensure that the color is contrast to each other so that the user can easily read it. As previous study has mentioned how color play in important role in HCI design for Asian countries that reflect low uncertainty avoidance cultural dimension (Karreman & Romeo, 2016), it relate with legible principle. The design should be rich with color to express the information the most. Not only it can be differed with background color, but it can also be appealing to draw the attention of the end user.

For ninth principle, few is regarding the number of icon designed (Horton, 1997). The numbers of icon design can be measured in term of how many of icons are necessary to accommodate the need of the user. As for this research, in a survey to gather the need for cultural-based emoticon, there is a section that asked participant on what cultural-based emoticon they wanted to be developed. Based on this, the number of in

demand cultural-based emoticon can be measured so that the number of Culturicon to be designed can be determine.

For tenth principle, compact principle is regarding the information included in the icon designed, whether it is necessary or not to be put in the icon designed (Horton, 1997). Lin (1992) in her study agreed that the design should be concise, which mean that the design is simple but meaningful. Any unnecessary element does not need to be included during the final phase of the design.

For eleventh principle, attractive principle is about the how the icon is illustrated, the usage of colors, patterns and values (Horton, 1997). Lan et al. (2013) explained in their study that attractiveness is important in designing an icon in order to cause the user's interest especially when the design is concerned with the recreational and aesthetic icons with a certain cultural element. Based on this, the combination of color utilization and the culture element play an important role to ensure that the design is attractive. The culture element can be attractive when end user is familiar with it and is usable to them.

For last principle, extensible principle means that whether the icon can be redesign for improvement in term of visual illustration, colors, size, and function (Horton, 1997). This means that this principle is used to upgrade the current design. This is relevant given the way emoji keep updating their emoji selection to meet current demand. The upgrade version is also required based on user feedback to cater their need. For extensible principle, side the study from Horton (1997), no other study has investigate on this principle.

For the design process of icon, Kaneko et al. (1991) proposed four steps which are: i) functional decision; ii) object selection; iii) object design; and iv) icon creation. In functional decision step, the designer need to decide the intended functions of the system for which the icons are to be created. In object selection step, designer need to select the object that will represent the intended functions. In object design, designer will design the object appearance of the icons. For the last step, which is icon creation, designer will start to create the actual icons drawing.

All of these icon design principles and design processes are crucial in this study, which serves as the foundation for developing the CDM. In terms of icon design principles, not all of them are chosen because only those that are appropriate for emoticon design are chosen. The justifications for the chosen principles are discussed in Section 4.1.2.

2.1.4 Emoticon and Emoji as Pictographic Representation

The pictograph representation used in CMC has changed over time in response to advances in computing technology. It all began with the usage of emoticon, the first pictograph used in CMC. Scott E. Fahlman, a computer scientist from Carnegie Mellon University in the United States was the first person who used emoticons in written text during an online forum in 1982 (Krohn, 2004). At first, it was used as a joke in the CMC. Due to its success in delivering the emotion expression, the usage of emoticons has become wider in many perspectives. Emoticon is the combination of the words "emotion" and "icon" that can be produced by using ASCII symbols or by creating pictograms, written in CMC (Skovholt, Grønning, & Kankaanranta, 2014).

According to Ruan (2011), emoticon can be defined as a combination of certain punctuations, numerals, keyboard character and special symbols designed that used to

convey an emotion, an appearance, object and tone of chatting. Emoticons usually were typed in sequence on a single line to form a human face. Urabe, Rafal and Araki (2013) in their study mentioned that emoticons can be divided into two types, which are the Western type and Eastern type. Both have been differentiated through the typing style. Western type tends to be used in horizontal style, rotates by 90 degrees (e.g., ":-)") while Eastern type is used in vertical style (e.g., "^_^"). They claimed that the Eastern type is easier to read than the Western type based on the non-rotation mode.

According to Yuki, Maddux, and Masuda (2007), when people express their emotion, the eye region is harder to control compare to mouth region. Eastern countries classify that as a collectivistic culture, while Western countries classify the situation as an individualistic. Collectivistic countries see more importance in controlled and subdued emotional expression in maintaining a harmonious relationships, while individualism emphasizes onto direct and explicit emotion expressions (Yuki et al., 2007).

Eastern countries mostly use emoticons in a positive way to give a more pleasant messages and harmonic atmosphere, while the Western countries use emoticons to express negative emotion while teasing and flirting (Kayan, Fussell, & Setlock, 2006). This culture corresponds to the cultural dimension of individualism versus collectivism in Hofstede culture model.
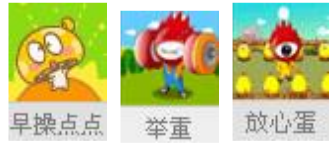
Hofstede (2011) explained that collectivism people are strongly incorporated with the group that make them want to maintain the healthy relationship, while individualism people have loose relationship with others that make them tend to use emoticons to tease and flirt with others, without caring about their relationship. It also further explained why Eastern countries focus more on the eyes rather than the mouth when

interpreting others emotion, in contrast to Western countries that interpret through the mouth since it is the most expressive part of the face. It has become as evidence that the usage of emoticon is depending on the cultural background.

Cao and Ye (2009) in their study identified that emoticons comprise from four different categories which are American Standard Code for Information Interchanging symbol (ASCIIS), Preload Static Images (PSI), Preload Dynamic Images (PDI) and Local Upload Images (LUI). ASCIIS is the emoticons or smileys made from the keyboard character. PSI is the emoticons based on the cartoon images designed by the professionals, while PDI is the emoticons based on short video or animation. LUI is the emoticons based on the images upload by the user. The example of the categories has been shown as Table 2.2 below.

Table 2.2

Categories of emoticon (retrieved from Cao and Ye, 2009)

Categories	Description	Example
ASCII Symbols (ASCIIS)	Made from keyboard character.	:) , ^_^ , >_< , <(^_^)>
Preload Static Images (PSI)	Cartoon images designed by professionals.	
Preload Dynamic Images (PDI)	Short video or animation.	早操点点　举重　放心蛋
Local Upload Images (LUI)	Images upload by user.	我长得像不像周杰伦

There are variety ways of using the emoticons that differ according to their category. During the first step in ASCIIS category, the users need to recognize the emotion they want to express and know the combination to create the emoticons and type the combination of keyboard characters. Most of latest applications already provided the image of the emoticons without the need for user to type the symbol's combination anymore, known as emoji. They just need to select the emoticons that suit with the emotions that they want to express. For PSI, the cartoons are already there which are designed by the professional developers. Hence, the users simply need to select which one they prefer the most for the interaction purposes.

The same steps applied to PDI, as PDI is a short video and animation where the users need to watch the sample of PDI at the first place in order to know the content of the PDI before they can use it in an appropriate manner. This PDI also known as GIF or stickers. For LUI, user need to click the upload picture options, select the picture from the user storage, and click the upload option. Users can choose which category of emoticon they want to use that is compatible with any type of device they are using.

These are the evidence of pictographic evolution that started from emoticon to the creation of emoji, GIFs, and stickers. At first, user need to use ASCII keyboard to create emoticon. Now, developer have created emoji, GIFs, and stickers that are available in mobile messaging application. User only need to choose which one they want to use in CMC. The use of current pictographic representations has become well-known around the world due to their simplicity of use.

Shigetaka Kurita, a designer for NTT DoCoMo (a Japanese cellular provider), invented emojis in 1999 to meet the demand for image-based text messaging in Japan

(Kimura-Thollander & Kumar, 2019). The original collection of 176 12x12 pixel images was inspired by television weather symbols, street signs, Japanese characters, and manga phrases. With the release of the iPhone in 2007, emojis made their way to the West. Apple added an emoji keyboard for Japanese users in order to cash in on the emoji craze in Japan. Consumers in the United States discovered that they could unlock this keyboard by downloading Japanese apps from the App Store, leading them to become popular in the tech community.

Emojis were officially implemented into the Unicode standard in 2009, which means that any device, regardless of platform (Windows, Apple iOS, or Android), should be able to render emojis (Davis & Edberg, 2018). From there, use of emoji exploded all over the world, to the point that Oxford Dictionary named the emoji 'Face with tears of joy' the word of the year in 2015 (Oxford Dictionaries, 2015). Since emoticons, emojis, and stickers are all pictograph representations, the word "emoticon" is used in this study to describe them.

One of the benefits of using emoticons is the capability to help user in attention saving. Attention saving means that both sender and receiver will experience the time and energy savvy in terms of typing, reading, interpreting, and understanding the meaning and intentions of the users that expressed their emotions through emoticons.

In the period where Internet is vital in daily life, user need to optimize the time and energy spent to ensure a better social life. This situation makes people want to obtain the most informative information with the minimal attention and time. According to Cao and Ye (2009), users want to express their feelings and emotions as soon as

possible. So, emoticon is the best way for them to express their emotions CMC with minimal attention and time while dealing with CMC platform.

By using text-only message to express their emotions and feelings, the sender needs to spend more time to type the message, while the receiver needs to spend even more time to read, interpret and understand the message which obviously requires more attention as compared to emoticons (Cao & Ye, 2009). Emoticons have a simple-designed, convenient, and short where both sender and receiver require less attention and time to read and interpret every meaning. Although emoticons will never replace the role of texts, emoticons hold the more concise element than text due to the capacity of transforming the text into pictures, video or animation that channel the language system as to be more efficient and user friendly.

Besides, emoticons provide better additional cues than text which enable to enrich the exchange of emotional information (Alismail & Zhang, 2020; Derks et al., 2008; Feng et al., 2020; Kimura-Thollander & Kumar, 2019; Teh et al., 2020). Derks et al (2008) in their study claimed that emoticons were used in order to strengthen the verbal part of the message, to manipulate the interaction partner, to express humors, to put remark into perspective, to regulate the interaction and to express irony.

Emoticons are very useful in strengthening the intensity of the message. These claims were agreed by Lo (2008) that stated in his research regarding most of people fail to interpret the correct emotions, attitude, and attention intents without emoticons. User tends to misinterpret the message without emoticons more as compared to the message with emoticons.

Through message with emoticons, the receiver's personal opinion towards the message could change significantly based on the direct input given at their first sight. This happens as the emoticons allow the receivers to correctly understand the level and direction of the emotion, attitude, and intention from the sender.

The positive interpretation of receiver also can be strengthened through the combination of text and emoticon in one particular message (Lo, 2008). To be precise, the emoticons solve what the CMC is lacking which is the physical appearance of the users. By using emoticons, it did bring the physical sense of the user during the virtual communication. For example, when a person sends an angry message to another person, it can be seen as rude expression. But through the adding of emoticons in the angry message, it can be seen as a jokes or humor message. The used of emoticons has soften the negative tone and the intensity of the message.

Derks, Bos, and Grumbkow (2007) indicate that emoticons are frequently used in social-emotional contexts rather than the task-oriented context. Social-emotional context means that the communication happens by the user's own intention in social interaction.

Meanwhile, the task-oriented context means the communication happens because the user was asked or has to interact with set of tasks already instructed to the user. Social-emotional context usually involves with the persons that the user is familiar or know, while the task-oriented context usually happens with the persons that the user did not know. So, it is normal for a person to express his feelings and intention to somebody that he familiars with, which means by using the social-emotional context of communication.

In other words, a person tends to use more emoticons with friends rather than strangers. Teh et al. (2020) in their study reported the similar emoticons usage patterns. They stated that emoticon use is higher in less formal environments and use of the "relieved" emoticon is much higher among close friends than among other groups.

Emoticons also have been proved to be able to significantly improve the efficiency of communication (Alismail & Zhang, 2020; Cha, 2007; Goh & Kulathuramaiyer, 2020; Herring & Dainas, 2020; Yuizono, Qi, & Munemori, 2012). A finding by Cha (2007) shows that the usage of emoticons is valuable in preventing misunderstanding and provide a way of easy and efficient communication in CMC. Cha claimed that the communication become efficient because emoticons simply aid to define the meaning of text message and act like additional explanation.

Yuizono et al. (2012) in their study claimed that the usage of pictograms which is also under the category of emoticons in chat communication has increased the level of user's understanding rate through a less of mistakes in communication. Yuizono et al. (2012) have studied about the effectiveness of the pictograms in CMC between Japanese and Chinese speakers. The results show two tremendous effects when there is an increased onto the level of understanding of users upon two different native speakers, and there is an increased of capability in forming longer sentences with more conjunctions when they had the communication for the second time. This shows that the usage of emoticons improves the efficiency of the communication significantly.

Besides that, emoticons are able to attract user's attention because they are easy to be read and interpreted. The design of the emoticons plays a big role in determining the

attractiveness of emoticons. An attractive emoticon would make user to experience the convenient, which relate to psychological motivation.

Based on Cha (2007) in the result of the survey pertaining to Easterner and Westerner cultures, it showed that emoticons have given a great influence onto the quality of social relationship by forming the initial impressions and feelings, initial attractions, and intimate relationships on CMC.

Cha also suggests that the ambiguous emoticons should be redesign or readdress in a way to improve the meaning of the emoticons as to be more meaningful and more understandable regardless of generations and cultures' modifications in future. Therefore, an appropriate design model is required in order to create a convenient and effective emoticon capable of attracting the user's attention and capable of developing more benefits of emoticons in CMC.

2.1.5 Introducing Cultural-Based Emoticon

There is a demand for more emoticon development, particularly in cultural contexts. Feng et al. (2020) stated there is a high demand for more new emoticons selection to be developed particularly from the non-native English speakers such as China, Japan, Brazil, and Mexico hence confirming the emoticon craze that swept across cultures. With the successful utilization of application for the purpose of CMC such as Telegram, Whatsapp, Messenger, and Instagram, emoticon has become an important component in CMC.

Feng et al. (2020) also discovered that people from different cultural backgrounds have significantly different preferences for emoticons. This is related to the user's cultural

familiarity. User may prefer the emoticons that reflects more on their culture, element that they are familiar with. As a result, Feng et al. (2020) suggested that it would be insightful to study how cultural factors such as language and traditions could influence to the request of new emoticons.

Based on social-emotional context, Park et al (2013) in their research studied the emoticon on twitter that focused on the cultural boundaries, by concerning the geographical context apply in the medium such as country, language used, and the cultures. The study attempt to show that emoticon is not merely limited in conveying emotions, but also related to social-cultural norms. In this study, it shows that the emoticons usage style is influenced by the language that is common, apart from their local or first language.

It is also stated that the Philippine and Indonesia exploited the horizontal style because English is their dominant language after local language. This shows that culture give a great influence onto the usage of emoticon. It is also suggested that there will be a future study regarding emoticons that relates with environmental factors such as the cultural properties and animal signaling, which beneficial in leading to the differences between Eastern and Western worlds.

Besides that, current emoticons selection are missing many aspects pertaining to human actions, emotions, and expressions (Toratani & Hirayama, 2011). They claimed that these missing aspects results to incompatible emoticons usage because the user cannot configure the suitable emoticons that could represent or express their true emotions.

Recent studies also confirmed that this issue is still arise. A survey by Kimura-Thollander and Kumar (2019) showed that their participants also thought that the current emoticon selections had gaps and they want more emoticon that represent their culture to be added in the emoticon selection. They found that emoticons were now seen as effective in helping participants to convey their cultural identity and capable to help people to communicate across language barriers and served as catalyst for people to become closer.

Moreover, Goh and Kulathuramaiyer (2020) also expressed the same issue by stating that the current emoticon selection may be incompatible due to the lack of gesture, human behavior, and emotional expressions in accordance with specific cultural intent. They suggested a study of cultural emoticon to be done so that the cultural identities can be conserved.

The other aspects that are lacking based on the CLR done by the researcher is that the study related to the usage of emoticons that represent the cultures. The only past study that is related to the culture and geography, is the style or pattern on usage between Easterners and Westerners by Park et al. (2013) where the Easterners tend to use vertical style while Westerners tend to use horizontal style. The study regarding the design of emoticon which specify with cultures are still lacking in the present literature review.

Based on the CLR and the questionnaire survey, it was discovered that the study of cultural-based emoticons is still small in size, despite the fact that there are many benefits that could be brought if the emoticons are used in a wiser perspective rather than just to express emotion and expression. The cultural-based emoticons would

assist in introducing the culture of societies throughout the world and increasing the knowledge of the user.

By taking into consideration upon the usage of emoticons across the variety of cultural study, the cultural-based emoticon proposed in this research is very appropriate to convey the social-cultural norms that focus on race, religion, and culture in Malaysia, which are yet be explored in previous studies.

Therefore, a study to explore and develop the model of cultural-based emoticon design is important, which in this study focused on Malaysian cultures for the leading prototype. In developing the cultural-based emoticon design model, this study combined the principles of icon design with the dimension of culture models that were discussed previously. The selected principles in icon design and selected cultural dimensions are discussed in Chapter 3.

2.2 Distributed Collective Interaction

Distributed collective interaction is another term which representing the group of users who interact via online communication regardless of their geographical context. Distributed collective interaction is defined by Ripoche and Sansonnet (2005), where the distributed collective interaction involves a large group of people communicating across geographical and conceptual distances, time, collective resources and heterogeneous perspective or experience by using the technology such as CMC including forum, chat, and emails to interact.

Allwood and Lind (2010) define the collective interaction as social activity by describing the following social activity: (i) the purpose of the activity; and (ii) the

typical roles of the activity. Roles can often be further analyzed by describing the rights, obligations and competence requirements that connect with the role, (iii) the typical artifacts (instruments) of the activity; and (iv) the environment.

There is another study made by Foth, Bilandzic and Satchell (2011) which focused on collective interaction. Interaction in urban village has discovered the difference between collective interaction and network interaction. The result of the study is about collective interaction that tend to be more 'public' rather than 'private', more formal, asynchronous, permanent, hierarchically structured, and the interaction can be one to one and many to many broadcasts.

Earlier study by Ripoche and Sansonnet (2005) mentioned the factors of "Multi-participant", "asynchronous" and "semi-structured" as some of the factors that challenge traditional models of communication. All those factors and definition are related to this study as the collective interaction, which is the main focus of this study, since they provide the interaction between a group person that used CMC.

According to Kizilcec (2013), the increasing number of educationalist that use CMC as the medium for teaching or massive open online courses (MOOC) has attracted participants from different geographical areas. The participants with different background and culture have brought up the diverse ideas and perspectives towards the learning. Hence, each participant including the educators should alert with other participant's sensitivity by understanding their personality, cultural background, and motivation in developing healthy learning process and fostering the participant's interest during the learning engagement. In this situation, the usage of cultural-based emoticon is beneficial in intercultural interaction.

74

In addition, collective interaction could bring unity, belonging, and shared of joy by experiencing the opportunity of sharing the collective experience during the collective interaction process (Roughton et al., 2014). Roughton et al. (2014) stated in their study that the way people perceive or view their interaction with people is determine by their previous personal experience.

In the collective interaction, the interaction involves groups or categories, rather than individuals. This situation has changed the people's perception from seeing people as individuals, to seeing groups as single social entities. By viewing groups as single social entities, people's perceptions of strangers changed, allowing them to interact with one another as if they had known each other for a long time.

The target users for this research are the teenagers and all of them are student. Student mostly used to communicate through a group within the mobile application whether it was about their studies or social interactions. By communicating through these groups, the distributed collective interaction happens, where all the participants within the group are located separately and communicate collectively. Based on this, the model validation by end user, which are the teenagers were conducted in two phases: 1) distributed collective interaction, and 2) focus group discussion.

The distributed collective interaction phase is where all the participants were added in the Telegram group that contain the sample of Culturicon developed by designers. They performed the distributed collective interaction within one week. They were also encouraged to use the sample of Culturicon during their interactions.

After completing the distributed collective interactions, these participants were invited to participate in a focus group discussion at a later time. During the focus group discussion, these participants discussed their experiences in using the sample of Culturicon. The focus group discussion determined whether or not the sample of Culturicon was usable by the end user in distributed collective interaction.

2.3 Relation Between Emoticons and Computer-Mediated Communication

The role of CMC that acts as the intermediary of communication among users in the scope of society behavior has belong under the sociology discipline in HCI root, while emoticons are the current technology used in CMC to express emotion by using symbolic icon. The previous study by He and Huang (2014) mentioned that the usage of CMC has been argued by earlier work because of the limitation in traditional and usual communication patterns which is lack with the social presence and cues of the user.

Hence, the usage of emoticons in CMC is essential that acts as non-verbal communication cues that lead into the true intention, meaning, and effective communication among users (sender and receiver). Emoticons somehow solve the problem of the lack in social presence and cues of the user. Emoticon also has become the paralanguage in CMC (Hogenboom et al., 2013).

With the current technologies, the CMC can happen not only in one-to-one communication, but also in many-to-many communication that enables the video conferencing and online group discussion to be held. Due to its borderless communication geographically and culturally, the usage of emoticons can be utilized

76

into thorough cultural perspective by striving in introducing and promoting the culture of nations throughout the world.

Besides that, emoticons also can solve the problem of CMC that were raised by past studies (Feng et al., 2020; Goh & Kulathuramaiyer, 2020; Kimura-Thollander & Kumar, 2019; Miller et al., 2016; Toratani & Hirayama, 2011; S Wijeratne et al., 2016; Wiseman & Gould, 2018). It is mentioned that intercultural communication in CMC could lead to difficulty in understanding the message from the opposite cultures, which results to negative affective reactions and lower volume of communication.

Through emoticons, it can help user to express their intentions, feelings, and emotions more effective, hence helps the readers to get a betterment in understanding their true intentions while expressing their feelings. In addition, regardless the pattern of emoticons, which are in the form of icon or symbol, it has its capability to decrease the tense of the message and the negative reaction given by readers.

2.4 Relation Between Emoticons and Distributed Collective Interaction

A total understanding and consideration in avoiding any sensitivity sentiment are vital to engage into intercultural communication through CMC online learning, which definitely consisting of people from various backgrounds, different personalities, and different upbringings. As discussed previously, the communication may happen via video conferencing, audio sharing, and texting.

In using texting, the words may be interpreted differently to different people. Some may see it as a joke, while some may see it as a rude or angry statement. In order to maintain a healthy interaction, the usage of cultural-based emoticon is crucial so that

the true meaning and intention during the interaction is clear among everybody and the cultural knowledge can be embedded through the use of emoticons in CMC.

In the sharing of collective experience via CMC, it can be enhanced by using the cultural-based emoticon. People from different geographical areas can express and share their experience according to their cultural background by using these cultural-based emoticons. Not only they able to share their joy and experience, they also can share their different cultural background among each other. This can help the user to better understand other's cultures, hence maintaining the healthy relationship among participants.

2.5 The Essential of Cultural-Based Emoticon

The fact that 75% of mobile messaging application especially the non-native English speakers requested for more emoticons to be developed demonstrates how essential emoticons are to CMC (Feng et al., 2020). This is due to the advantages emoticons bring during the interaction via CMC such as: 1) provide better additional cues than text-only (Alismail & Zhang, 2020; Derks et al., 2008; Feng et al., 2020; Kimura-Thollander & Kumar, 2019; Teh et al., 2020); 2) able to significantly improve the efficiency of communication (Alismail & Zhang, 2020; Cha, 2007; Goh & Kulathuramaiyer, 2020; Herring & Dainas, 2020; Yuizono et al., 2012); 3) attention saving (Cao & Ye, 2009); and 4) attract user's attention (Cha, 2007). These advantages have been discussed in Section 2.1.4.

The communication through messaging or keyboard-based takes longer time as compared to ordinary F2F communication, and people need the meta-communicative

the features like emoticons as other ways in a way to convey the meaning faster (Riva, 2002). Thus, emoticons are the important mechanism that beneficial to make the text-based conversation becomes more efficient and attractive.

Based on the observation, emoticons are widely used across social networks as it is simple and visually, which are easy to be read and interpreted its real meaning (Huang et. al, 2013). The possibility of intercultural to be encountered in social networks is also high. Therefore, the usage of emoticons has emerged in non-verbal communication in this recent age. To ensure a better understanding between the intercultural communications in social networks, the design of cultural-based emoticon has met its crucial need.

On E-Learning, foreign teachers and students may involve in a group discussion. The used of emoticons, keyboard symbols, acronyms, grammatical and phonetic symbols enables the communication between foreign teachers and students to be successful (Istifci, Lomidazde, & Demiray, 2011). These kinds of interactive environment do assist in attracting both teacher's and student's attentions and support them in learning environment.

As a result of the interactivity of the learning process, many people across boundaries can now participate, allowing collaborative learning to take place. By implementing the collaborative learning, the learner who gains knowledge can distribute the information through sharing session with other students. When there is a healthy social interaction around, the level of interest regarding the topic learnt will increase, and hence producing greater understanding and result to the particular center.

The usage of Facebook for educational purposes would be one of the vivid examples, where there are a lot of Facebook groups or pages that been used for educational purposes. The members are allowed to ask questions, ask for educational resources and materials, share videos and links. These interactive activities have fulfilled the basic functions of collaborative learning (Istifci et al., 2011).

According to Nguyen and Fussell (2013), when the communication takes place across cultural boundaries, there are differences of messaging types that people would produce and there is the possibility for the receiver to experience the misunderstanding and emotional misleading during the conversation.

Nguyen and Fussell (2013) might not pinpoint the usage of emoticon, but the important point to take into attention is how important the diversity of cultural may affects the conversation itself. Since the use of emoticon becomes a trending nowadays, the designers and authorized body need to classify and design the appropriate emoticons for specific cultural view to contribute to the effectiveness of text-based conversation.

2.6 Chapter Summary

This chapter discussed about the essence of this research. The chapter explains about the field of this research, which belongs under the discipline of GUI in HCI root and the components that are related to the field of CMC, emoticons, and distributed collective interaction. The issue in the CMC and current research on emoticons have also been discussed that strengthened as a prominent factor for this research to be

conducted. The culture models were reviewed in which some of the dimensions in the model were used in developing the CDM.

According to the literature, the study regarding the cultural-based element in emoticon is less even though the usage of emoticons is essential in CMC, while the culture models in HCI area were mostly brought on websites' focal point. Thus, by taking consideration into the culture model dimension and HCI icon principles, this research attempts to develop the CDM, which is vital in order to design and develop emoticons that represent cultures in CMC. The methodology of this research will be discussed in Chapter 3.

CHAPTER THREE
RESEARCH METHODOLOGY

3.0 Introduction

The main focus of this research is to propose a model for designing cultural-based emoticon known as Culturicon Design Model (CDM). Therefore, this chapter discusses on the research approaches that were used in achieving this research objectives. In doing so, this chapter starts by discussing the research design that determine the method used in this research and the research framework which is the foundation of this study. The proposed research framework that consists of six phases were explained in detail. Each phase will answer the research questions to achieve the research objectives. The summary of this research methodology is discussed at the end of this chapter.

3.1 Research Design

In conducting research, Creswell (2009) stated that there are three research designs that researchers can adopt. The research designs of quantitative, qualitative, and mixed methods are all included. The research design chosen will determine the research flow and procedures from data collection to data analysis.

As for this research, the research design of mixed method was chosen. This is because this research involved both qualitative and quantitative data in the research process. According to Creswell (2009), mixed method is a combination of quantitative research design and qualitative research design. It involves triangulation which refers to the

82

integration process of two forms of data. The data collection process will be conducted concurrently or sequentially in order to grasp the research problems.

The data collection process includes collecting numerical data and textual information that satisfy both quantitative and qualitative needs and requirements. The mixed method was chosen for this study because it aims to develop a more comprehensive understanding of the verification and validation results by combining qualitative and quantitative data. Besides that, the study of cultural element cannot be measured by objective and quantitative data alone (Alshehri, Abokhodair, Kirkham, & Olivier, 2021; Bălan & Vreja, 2013). It needs to be complemented together with qualitative data, to gather richer data from the participant.

The research started with the study of past literature through CLR and followed by the questionnaire survey to collect data from the public. The questionnaire survey was used as the preliminary study to gather the issue and problem arise within the real-world users and to ensure that the problem gathered is align with the CLR. Based on the results of CLR and questionnaire survey, the HCI icon design principles and cultural dimensions for cultural-based emoticon were identified through literature search.

After the model was developed, the verification and validation process were used to gather the quantitative and qualitative data. In verifying the model, the expert verified the model by answering the questionnaire and gave comments and suggestion through an interview session to ensure that the data that were not covered in questionnaire were captured. The quantitative data were collected in questionnaire part, while the qualitative data were collected in interview part.

After amendment were made based on the verification results, validation process was conducted. Validation process was conducted in two parts: 1) Validation by designer and 2) Validation by end user. The designer is the one that used the model to develop sample of Culturicon, while the end user which is the public user is the one that used the sample of Culturicon during CMC. Data gathered in the validation by designer are in the form of quantitative data while data gathered in the validation by end user are in the form of qualitative data.

These research designs were used in this research where the main aim of this research is to propose a new model of cultural-based emoticon design. Figure 3.1 shows the research framework used in this research that are based on the selected research designs.

There are six phases of method involved in this study. The first phase is theoretical studies, performed to achieve first objective. Then there is phase two, cultural dimensions identification to achieve second objective. Third phase is design and develop the model based on the information gathered in phase one and two. The fourth phase is model verification, performed through expert review to achieve the third objective. Next is the fifth objective, which is model validation by the designer and end user to achieve the fourth objective. The final phase is result analysis to discuss on the findings of this study by using qualitative analysis tool, Atlas.ti (version 9).

PHASES	METHOD & ACTIVITIES	OUTPUT
Phase 1: Theoretical Study	1. Perform CLR to gather previous studies regarding emoticon. 2. Questionnaire survey to gather public feedback. 3. Review the HCI icon design principle.	**Achieved Objective 1:** Identified appropriate principles in designing emoticon. *(Research Question 1)*
Phase 2: Identify Cultural Dimensions	1. Review the cultural models. 2. Identify the dimension of cultural model.	**Achieved Objective 2:** Identified cultural model dimension in designing emoticon. *(Research Question 2)*
Phase 3: Design and Develop Model	1. Design and develop Culturicon Design Model based on principles and dimensions obtained using Ideating from Design Thinking Method	Developed first draft model.
Phase 4: Model Verification	1. Design expert's verification document. 2. Identify expert. 3. Perform model verification. 4. Collect and analyze feedbacks. 5. Make amendment of the model.	**Achieved Objective 3:** Developed Culturicon Design Model *(Research Question 3)*
Phase 5: Model Validation	1. Design the validation measures. 2. Identify participants. 3. Perform model validation by designer. 4. Perform validation by end user.	
Phase 6: Result Analysis	1. Analyze result using Atlas.ti	**Achieved Objective 4:** Obtained validated Culturicon Design Model. *(Research Question 4)*

Figure 3.1. Research Framework

3.2 Phase One: Theoretical Study

In this phase, the methods used for the theoretical study are CLR and questionnaire survey. The CLR is a method adapted from Kitchenham (2004) SLR that was primarily used to study the circumstances in the previous studies, in which the data was gathered from journals, articles, and other academic materials. In other words, SLR is the secondary study, while the studies by individual that contribute to the SLR are considered as the primary studies. According to Kitchenham (2004), the reasons of doing SLR are: (i) to summarize the existing evidence concerning technology; (ii) to identify the gaps in current research in order to suggest areas for further investigation; and (iii) to provide a framework or background in order to appropriately position new research activities.

Referring to the reasons of doing SLR by Kitchenham (2004), the purposes of using CLR in this study are to gather the area of study regarding the usage of emoticons, to know whether there are research regarding emoticons that relate or represent the culture of nations, and to gather the appropriate methods to validate the new emoticon design. By doing so, this study was able to easily determine the dimensions of previous studies as well as the gaps in current research regarding emoticon usage. Results obtained from CLR defined the focus of this research in developing CDM.

Figure 3.2 shows the steps involved in CLR that were adapted from Kitchenham (2004). There are three main steps in CLR namely: (1) planning the review; (2) conducting the review; and (3) reporting the review.

86
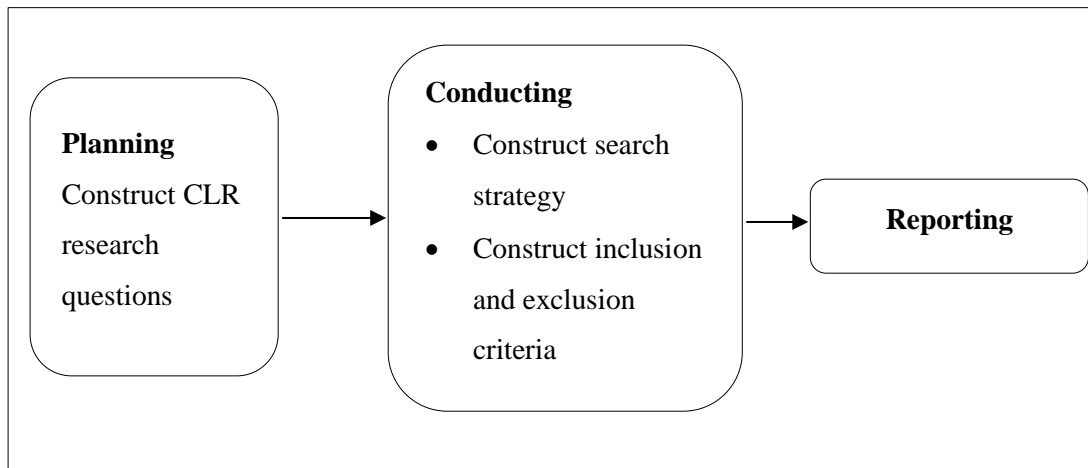
Figure 3.2. Comprehensive Literature Review Method

As stated before, this study performed CLR that adapted the method in SLR. Hence the methods are similar to SLR. In planning the review, research questions need to be constructed in order to decide the search strategy for CLR in conducting the review step. In conducting the review, the processes involved are: (1) constructing the search strategy; (2) identifying the paper; (3) selection of paper; (4) extracting the content of paper; and (5) synthesis the information gathered. Last process is reporting the review step, which includes a single stage phase. The results of CLR were used as the evidence in identifying the gaps in current research regarding emoticons.

Then, a questionnaire survey was conducted to support the evidence from the CLR. While the CLR results present evidence from previous studies, the questionnaire survey provides evidence from the target population, the end user. Results from both methods were analyzed as the evidence in this study.

3.2.1 Comprehensive Literature Review Implementation

Results from CLR define the focus of this research in developing CDM. The results are the evidence of the gaps in current research regarding the emoticon studies.

3.2.1.1 Planning the Review

This step requires research questions to be constructed in order to achieve the aim of CLR. The research questions as in Table 3.1 are the prior guideline for the search strategy in conducting the review step.

Table 3.1

Research Question of CLR

No.	Research Question
1.	What are the areas of previous study regarding the usage of emoticon?
2.	Are there any research regarding emoticon that represents or relates with certain cultures around the world?
3.	What are the appropriate methods to validate the new emoticon design?

The research questions for CLR were constructed based on the research objective. For the first question, it seeks to gather the area of previous studies that studied emoticons. This question can provide the number of previous studies, indicating which areas of research are still lacking. Based on the findings, it can be determined whether or not research in the culture area is still lacking.

For the second question, it seeks to gather previous studies on emoticons that were culturally focused. This question was designed to determine whether the study involves the relationship between culture and emoticon, the emoticon development process, and emoticon usage. This finding can provide a brief overview of how to carry out this research.

For the last question, it seeks to gather on how the newly developed emoticon design can be validated. The CDM output will be the sample of Culturicon. It must be

validated to ensure that the design is easy to understand and easy to use. The validation method gathered from this finding can be adapted in this research to validate the sample of Culturicon.

3.2.1.2 Conducting the Review

The steps to conduct the review consist of two different parts. Part one is search strategy, while part two is inclusion and exclusion criteria.

A. Search Strategy

The search strategy is where the researcher constructs the search string for searching the relevant paper. The search strings are based on CLR research questions. The search strings for CLR are "Emoticon" OR "cultural emoticon" OR "cultural based emoticon". The papers that were acquired based on these search strings were filtered in the inclusion and exclusion part. Table 3.2 shows the result of the search strategy from four digital libraries.

Table 3.2

Digital Libraries Used in CLR

Digital Libraries	Address	Mapping Date	Results
IEEE	http://ieexplore.ieee.org	April 2015 – Feb 2017	105
ACM	http://dl.acm.org	April 2015 – Feb 2017	69
Science Direct	http://www.sciencedirect.com	April 2015 – Feb 2017	521
Web of Science	http://apps.webofknowledge.com	April 2015 – Feb 2017	53
Total Articles			748

B. Inclusion and Exclusion

The inclusion and exclusion part were conducted in order to ensure only relevant papers are selected for the study purposes. All the papers obtained from the searching process are reviewed and revised based on their title, abstract, literature, methodology and conclusion. The papers that are not relevant or related with this study were excluded from the list. For example, most of the digital libraries also show the results that contained the term of "emotional" rather than "emoticon" in the searched paper, which some are non-relatable or related type of reading material with emoticons' keyword. Hence, the papers that are not related with emoticons need to be excluded. The inclusion and exclusion criteria are as follows:

a) Inclusion Criteria

The inclusion criteria are used to determine which literature that comprised from journals, papers, and technical reports that were found from the search string would be used in the research. The papers that are related to the emoticon, CMC and was written in English only are being considered by the researcher. The other criteria are listed below:

i.   Studies that relevant to the research questions.
ii. Studies that describe the functions of the emoticons in computer-mediated communication.
iii. Studies that describe the usage of the emoticons in computer-mediated communication across countries and cultures.
iv. Studies in the range of 2007 – 2017.

b) *Exclusion Criteria*

The exclusion criteria are contrary from inclusion criteria where the exclusion criteria were used to determine which literature review will be excluded from the research. The criteria are listed below:

i. Studies that not relevant to the research questions.
ii. Studies that do not describe emoticon.
iii. Studies that do not describe the computer-mediated communication.
iv. Studies other than emoticon and computer-mediated communication.

The Table 3.3 below shows the final number of chosen papers that are relevant to this study according to the inclusion and exclusion criteria which described previously. The total number of final chosen papers is 30.

Table 3.3

Final Paper for Review

Journals	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
IEEE	-	-	1	2	1	4	5	1	3	1
ACM	1	2	-	1	1	2	5	5	2	2
Science Direct	2	-	-	-	-	1	1	-	1	-
Web of Science	-	-	-	-	-	-	-	2	-	-
Total	**3**	**2**	**1**	**3**	**2**	**7**	**11**	**8**	**6**	**3**

3.2.1.3 Reporting the Review

From the searched results, the papers that are considered by the researcher are based on the discussions of the abstract, overview, challenges, analysis, dimensions, and perspectives regarding the usage of emoticons. Table 3.4 displays the area of previous study and number of studies that have a review about the topic. The areas of studies are related to the factors that influenced the usage of emoticons. This result answers the first question which is "*What are the areas of previous study regarding the usage of emoticon?*".

Table 3.4

Area and Number of Study

Area of Study	Number of Study
Sentiment of document/sentence	14
Classification of emoticons	8
Social interaction relationship	4
Markers of attitudes	4
Non-verbal communication cues	4
Type of feedback	4
Design of emoticons	2
Alert reader	2
Attention saving	1
Teenage phenomenon	1
Gender classification	1
Cultural usage style	1
Total	**46**

For the answer to the second question which is "*Are there any research regarding emoticon that represents or relates with certain cultures around the world?*", based on the CLR conducted, it is found that there is lack of study regarding emoticons that represents or relates with certain cultures around the world. This is because cultural studies in HCI practices have been difficult to execute in their attempts to recognise and classify meanings, attitudes, and expectations that are deeply embedded in thoughts, behaviors, and actions (Dhaundiyal et al., 2020). Besides that, the study on culture is not measurable by objective and quantifiable criteria (Alshehri et al., 2021; Bălan & Vreja, 2013). The study of culture and HCI demand great efforts that begin with investigating theoretical and methodological aspects and practices (Piccolo & Pereira, 2019).

There is only a study by Park et al. (2013) which investigated the usage style of emoticons that varies by geography and culture, and not focusing on the way of how

the emoticons represent or relates with the culture. Park et al. (2013) compared the usage style of emoticons between Westerners and Easterners from which the Westerners employed the horizontal like of emoticons, :-), while the Easterners employed the vertical like of emoticons, ^_^. This variance of usage is due to the Westerners favorability in interpreting the expression from the mouth, while the Easterners tend to interpret the expression through the eyes.

For the third question which is "*What are the appropriate methods to validate the new emoticon design?*", the answer is there are two steps to validate a new emoticon design. The first step is the verification of the new emoticons design, and the second step is the evaluation of the usage of the new emoticons design. The purpose of the verification of new emoticons step is to investigate whether user could properly recognizes the emotional states, behavior and culture of the new emoticons as what they are intended to. Chen, Ma, Cerezo, and Pu (2014) used verification method before they implemented their new design of emoticons which they named as the *Empatheticon* into the *GroupFun*, a group music recommender.

The verification method was done by recruiting several participants, who are expert users and novice users in verifying the emoticons. They provide a list of new emoticons and a set of options which contain the exact meaning of the emoticons. The participants need to match the emoticons with the set of option given. After the verification process finished, the results were analyzed and the feedback from the participants were classified into the terms of the design and expression of the emoticons.

93

The second step is evaluation of the usage of new emoticon, where the main purpose is to measure the impact of the new emoticons in terms of how the user may use, perceive, and react towards the emoticons when they are using it. This method can be executed when the new emoticons have been employed in the CMC. Several participants were recruited to test the new emoticons that employed in the CMC, considerably other people than the participants during the verification method.

The place was in laboratory or some place that has stable Internet connection and less disturbance/noise from the public so that the users stay in solid focus during the evaluation process. All the participants were divided into several groups so that the researcher can monitor the process easily. Then, an internet chats or any CMC was performed by the participants among their group members accordingly, which discusses on socio-emotional context, with the new emoticons were employed throughout the virtual interaction session. Their records of conversations in the CMC were taken and the usage of the new emoticons were analyzed in terms of how they use, perceive, and react when they experience the interaction.

The participants also were encouraged to think aloud during the chatting. After that, a post-questionnaire was distributed to the participants to assess their experience and measure their satisfaction upon the use of the new emoticons. Chen et al. (2014) in their study used ResQue (Recommender systems' Quality of user experience) model of questionnaire in order to assess the quality of user experience of their *Empatheticon* usage in the music recommender system.

3.2.2 Public Questionnaire

The questionnaire survey sessions were performed to investigate the need for cultural-based emoticons in CMC among Malaysians by obtaining feedback regarding usage of emoticons and the need for cultural-based emoticons in their daily CMC use. The results of the questionnaire survey were used to support the results from the CLR where the researcher found that there is a lack of study on cultural element in emoticon created to be used in CMC.

The target respondents for this questionnaire survey were Malaysian as the researcher wants to focus on Malaysia's culture as the leading prototype for CDM, that also can be used to other countries for future work. The questionnaire used objective and subjective questions and statements in order to gather the feedback. The questionnaire consists of a demography section, a personal usage experience section, and an opinion regarding emoticons section.

The questionnaire survey has taken place in Universiti Utara Malaysia (UUM). The total respondents were 50 respondents. The questionnaire was distributed to the respondents and the respondents were free to ask the researcher if there were questions that they did not understand or confuse. Most of the respondents took about three minutes to complete the questionnaire. The results of the questionnaire survey were analyzed by using Microsoft Excel.

According to the collected questionnaires, for the demography section as in Figure 3.3, the respondent profile indicates 20 respondents are male, while 30 respondents are female. Regarding the age of the respondents, 28 respondents are in the range of 15 to 25 years old, 13 respondents are in the range of 26 to 35 years old, five

respondents are in the range of 36 to 45 years old, and four respondents are age of 46 and above. Figure 3.3 shows the result for demography section.
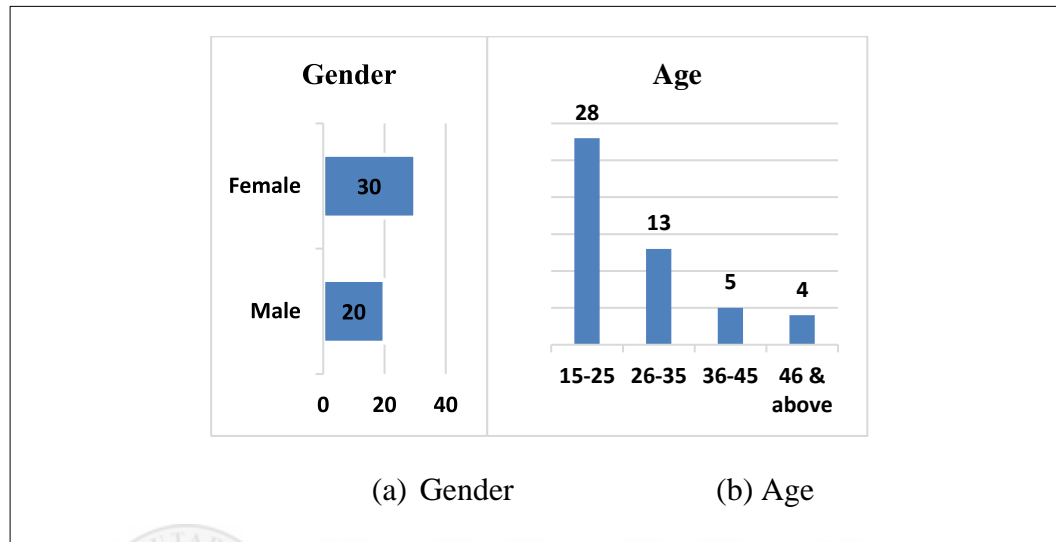
Figure 3.3. Demography Section (a) Gender (b) Age

For the user experience of CMC and emoticons section, there are five questions. First question asked whether the participant is a smartphone user, and the result clarifies that all respondents is a smartphone user. The second question tends to identify what type of smartphone they are currently using. The result shows that 43 respondents are using Android phone, seven respondents are using iPhone, and zero for both windows phone and blackberry. The third question asked participant to tick what application they are using to have a conversation with other people.

Result shows that 50 respondents are the user of WhatsApp, 44 respondents are the user of Facebook Chat, 21 respondents are the user of WeChat, 17 respondents are the user of Telegram, 10 respondents are user of Twitter, six respondents are user of LINE, and three respondents tick Other for application that is not listed in the answer section.

96

The fourth question asked if the participant is using emoticons to express their feelings, actions and reactions during online conversations or CMC. The results show all of the participants is using emoticon in CMC. The fifth questions asked the participant about the frequency of emoticons usage during the virtual conversation. Result shows that 27 of the participants frequently use the emoticons, 19 of participants use it sometimes, four of participants use it rarely, and zero respondents never use it. Figure 3.4 shows the result for smartphone type, used mobile application, and emoticons usage's frequency.

(a)   (b)

(c)
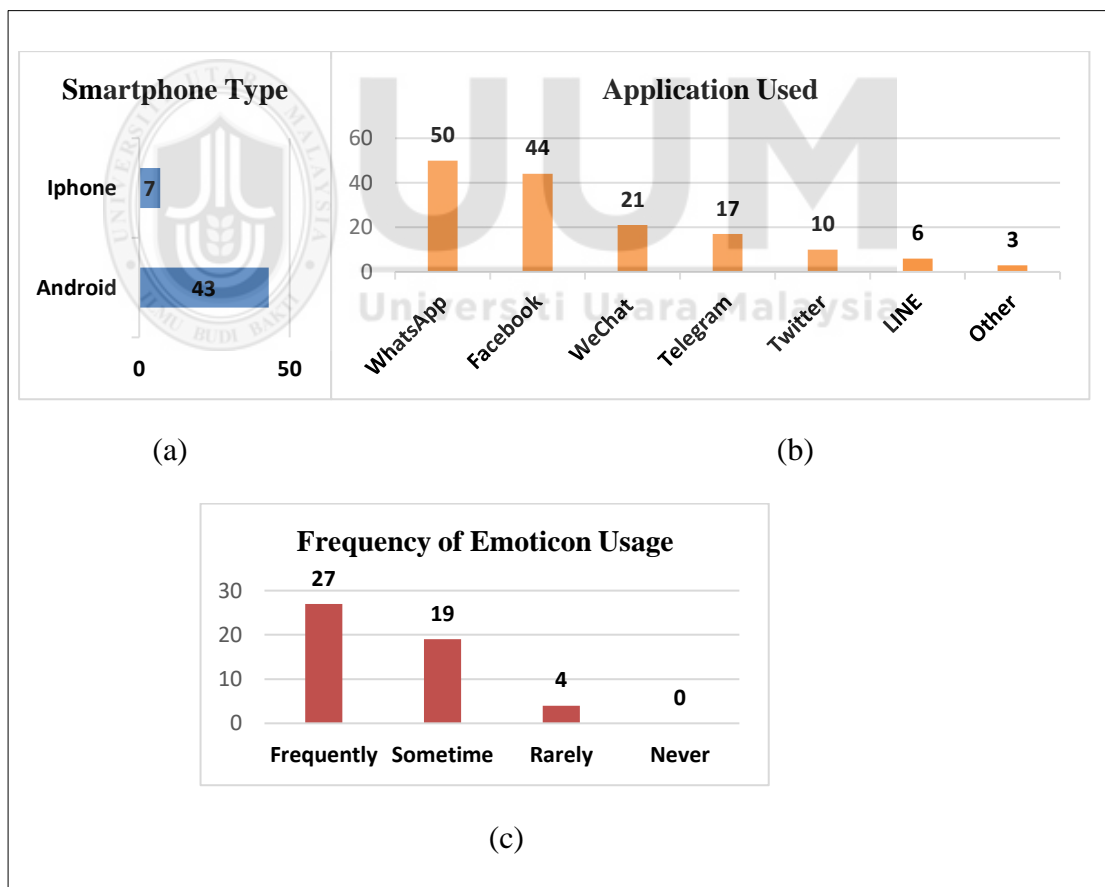
Figure 3.4. User Experience regarding CMC & Emoticons Usage (a) Smartphone Type, (b) Application Used, (c) Frequency of Emoticon Usage

In the opinion regarding emoticons section, there are five questions. Four questions used the Likert-Scale format, and one question asked user to describe which Malaysian culture should be implemented in cultural-based emoticon. Table 3.5 below shows the mean result based on the opinion section in the questionnaire.

Table 3.5

Mean Results

Questions	Mean
1) Do you think that the current emoticons available are sufficient enough to express your feelings, actions and reactions during the online conversations?	4.02
2) Do you agree that current emoticons available are lacking in terms of Malaysia's cultures?	6.02
3) If new emoticons based on Malaysia's cultures are created for example Hari Raya celebration, national dress, and traditional foods, do you think it will be useful?	6.58
4) Do you think by using the Malaysian culture of emoticons would help in introducing Malaysian cultures worldwide?	6.56

The opinion section of the questionnaire has used the Likert-Scale format. The result is compared by the various range of answer from: i) strongly agree (7); ii) agree (6): iii) neutral (5); iv) disagree (4), and v) strongly disagree (3). For the first question which is *"Do you think that the current emoticons available are sufficient enough to express your feelings, actions, and reactions during the online conversations?"*, Table 3.5 shows that the mean result is 4.02 which in the range of Disagree. This result shows that the participants think that current emoticons which available in the CMC are not sufficient enough to be used in order to express their true feelings, intended actions and reactions during the virtual communication.

For the second question which is "*Do you agree that current emoticons available are lacking in terms of Malaysian cultures?*", the result shows the means as 6.02, which is in the range of Agree. This result shows the collective agreement among the participants upon the lack of Malaysian cultures in current emoticons through CMC. The result of the second question is consistent with the result of the first question where the insufficient emoticons that available in CMC leads to the lack of Malaysian cultures to be utilized in the virtual interaction system.

For third question which is "*If new emoticons based on Malaysian cultures are created for example Hari Raya celebration, national dress, and traditional foods, do you think it will be useful?*", result shows the mean result at 6.58, which is in the range of agree. This result indicates that the new emoticons that are based on Malaysian cultures could be useful, beneficial and in demand among Malaysian where the current emoticon is still lacking with local cultural aspect.

For fourth question which is "*Do you think by using the Malaysian culture of emoticons would help in introducing Malaysian cultures worldwide?*", result shows that the mean result at 6.56, which is in the range of agree standpoint. This shows that participants do agree that by utilizing Malaysian cultures' emoticon could possibly help in introducing Malaysia throughout the world if the demand emoticon group is available in CMC.

The questionnaire's last question asked participants to optionally describe Malaysian culture that is in high demand but does not yet exist in cultural-based emoticon. 32 participants gave their opinions while 18 participants leave the answer as to be unknown. The participants are required to give their opinion either by writing or

drawing in order to illustrate their opinion. The researcher has categorized the opinion according to their category, and the details has been described as Table 3.6 below.

Table 3.6

Cultural Opinion by Participant

Category	Frequency
Malaysian National Costume	12
Malaysian Food	8
Malaysian Celebration	8
Malaysian Traditional Game	5
Malaysian Historical Place	2
Malaysian Flower	1
Emoticon with patriotic sound	1

Table 3.6 shows the result of the last question, where there are seven categories of cultural opinion from the participants. Malaysian national costume has the highest frequency with 12 answers, followed by Malaysian food and celebration with eight (8) answers, traditional game with five (5) answers, historical place with two (2) answers, and Malaysian flower and patriotic sound with one (1) answer both.

Based on the CLR and survey results, this study found that there is a need for CDM to be implemented so that there will be more useful and beneficial Culturicon can be developed and used in CMC in order to overcome its lacking.

This finding is consistent with those of Feng et al. (2020), Goh and Kulathuramaiyer (2020), Kimura-Thollander and Kumar (2019), and Toratani and Hirayama (2011), who found that current emoticons are still lacking and missing the aspects of human actions, emotions, and expressions in their studies. Based on the acquired HCI icon

principles, cultural dimensions, and the questionnaire survey results, CDM was designed and developed.

3.2.3 Selected Principle in Designing Icon

After it is determined that there is a need for creating emoticons that represent cultures to be used in CMC through CLR and questionnaires from public respondents, the next step is to determine what are the guidelines, requirements, and principles for designing and developing the cultural-based emoticon. As discussed in Chapter 2, Section 2.1.3, there are several principles in designing icon in HCI perspective proposed by previous studies. Based on the proposed principles by these studies, it is found that some principles are similar. Table 3.7 below shows the principles and the authors from previous studies.

Table 3.7

Summary of Principle in Designing Icon

Principle	Author
Familiar	Horton (1997), Lin (1992), Kurniawan (2000), Chen (2003), Heim (2007), Chiu (2012), Lan (2013), Islam (2016)
Understandable	Horton (1997), Chen (2003), Chiu (2012), Lan (2013), Islam (2016)
Attractive	Horton (1997), Lin (1992), Chiu (2012), Lan (2013)
Coherent	Horton (1997), Lin (1992), Beason (2005), Lan (2013), Islam (2016)
Informative	Horton (1997), Lin (1992), Chiu (2012)
Distinct	Horton (1997), Kurniawan (2000), Chen (2003), Islam (2016)
Unambiguous	Horton (1997), Lin (1992), Islam (2016)
Memorable	Horton (1997), Chiu (2012)
Compact	Horton (1997), Lin (1992)
Legible	Horton (1997)

Table 3.7 continued	
Few	Horton (1997)
Extensible	Horton (1997)

As in table 3.7, the most discussed principle by previous researchers is familiar with nine studies, followed by understandable, attractive, and coherent with five studies, informative and distinct with four studies, unambiguous with three studies, memorable and compact with two studies and lastly with only one study, legible, few, and extensible.

All of these principles have been proven to be vital to the development of icons. As for this study, the principle of familiar, understandable, attractive, coherent, informative, distinct, unambiguous, memorable, compact, legible, and extensible are selected to be used in developing the model for cultural-based emoticon design. Because the principles of few and extensible are not crucial for the proposed model, they were not chosen. This is because, the number of icons to be developed based on for few principle will not be measured because the model's objective is to develop efficient and effective icons regardless of how many icons developed. As a result, the number of emoticons develop are not appropriate for this study.

At the end of this phase, objective 1 is achieved which is to identify the HCI icon principle in designing Culturicon.

3.3 Phase Two: Identify the Dimensions

In identifying the cultural dimensions of cultural-based emoticon design model, the cultural models were studied. The Hall culture model (Hall, 1959), the Trompenaars and Hampden culture model (Trompenaars & Hampden-Turner, 1997), and the

Hofstede culture model were all considered in this study (Hofstede, 2011). After reviewing these three models, the dimensions from these models were classified into classifications because the dimensions from these models have the same meaning.

The classifications can be referred to Table 2.1 in Section 2.1.2.4. The classifications are: 1) possession/power in society; 2) relationship with people; 3) importance of time; 4) reaction to law; 5) attitude towards nature; 6) difference in gender; 7) survival; 8) adaptation learning; 9) jokes in learning; 10) interaction with people; 11) relationship approach; 12) emotional relationship; and 13) freedom of life.

Following a review of previous HCI studies, significant cultural dimensions were found to be used in their studies, resulting in the selection of cultural dimensions used in this research. Based on the 13 classifications mentioned before, there are only five classifications of cultural dimensions selected for this research which are: 1) possession/power in society; 2) relationship with people; 3) importance of time, 4) reaction to law; and 5) difference in gender. The justification of these chosen classifications of cultural dimensions are discuss in Chapter 4.

The study of cultural models that were used in HCI studies led to the identification of cultural dimensions for CDM, thus achieving the objective 2.

3.4 Phase Three: Design and Develop Model

The process to design and develop CDM is discussed in this section. The dimensions from the three culture models that were discussed in Section 2.1.2 are considered along

with the HCI icon principles in designing and developing the CDM. The flow to design and develop the cultural-based emoticon model is as in Figure 3.5.

As shown in Figure 3.5, the design and development process for CDM started by gathering the requirement for cultural-based emoticon from the CLR and questionnaire survey from the public. Based on these requirements, the principles in designing emoticon were gathered by reviewing the previous studies that investigate the HCI icon principles. After the principles in designing emoticon were gathered, the cultural dimensions from the cultural models were reviewed and selected. The selected cultural dimensions are based on the reports and suggestions from the previous studies that mentioned these dimensions are appropriate and suitable to be implemented for Asian countries.
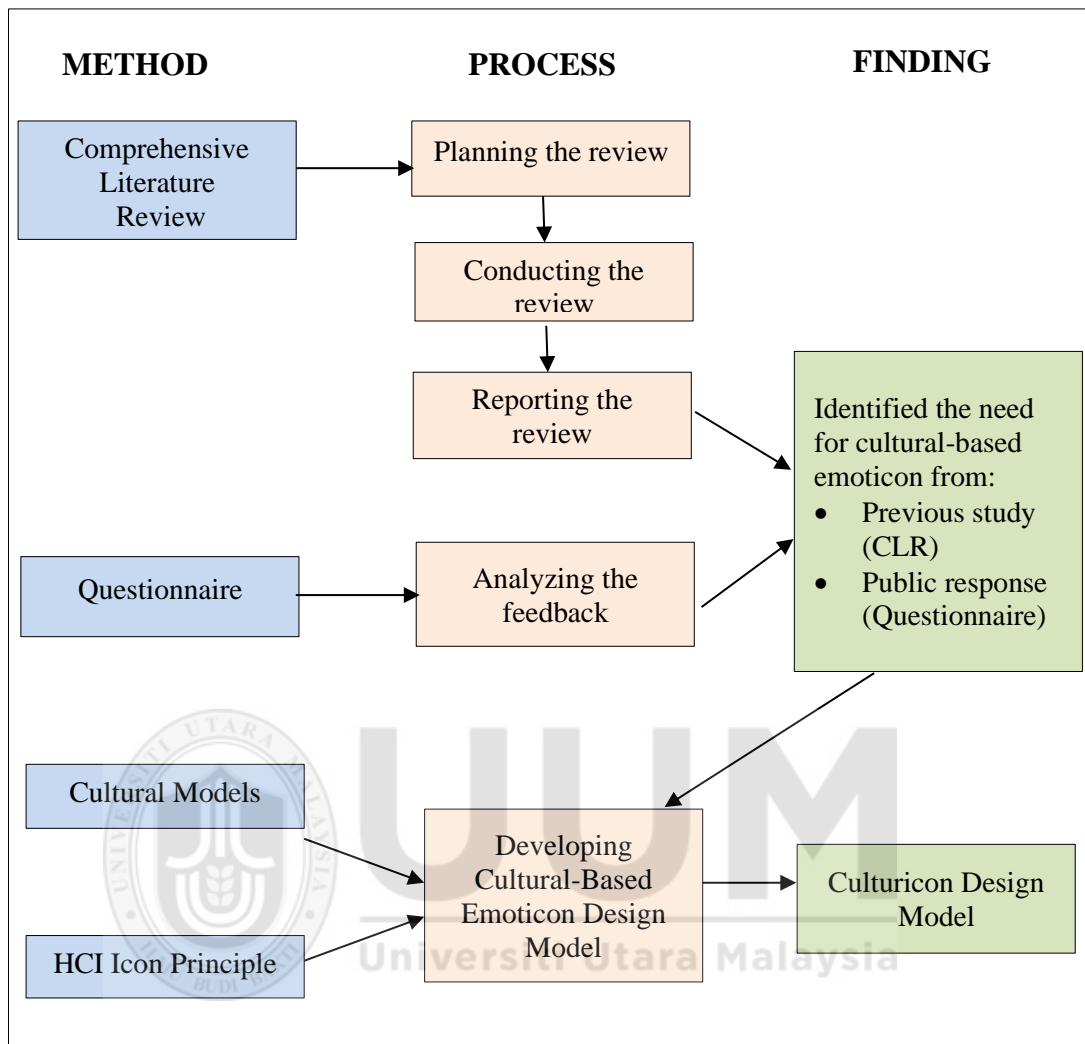
Figure 3.5. Design and development process for cultural-based emoticon design model

The CDM comprised of culture and emoticon phases where the culture phase covers the dimensions of cultural element with five dimensions which are power distance, individualism versus collectivism, long term versus short term, uncertainty avoidance and masculinity versus femininity. While the emoticon phase covers the principle in designing icon from HCI perspective with eleven principles are selected which are familiar, understandable, attractive, coherent, informative, distinct, unambiguous, memorable, compact, legible, and extensible.

Figure 3.6 shows the draft of conceptual model for CDM. In designing the CDM, this research applied the ideate phase from the design thinking method by Nielsen. According to Nielsen, design thinking ideology asserts that a hands-on, user-centric approach to problem solving that can lead to innovation, and innovation can lead to differentiation and a competitive advantage. The design thinking framework consists of: i) understand (empathize and define); ii) explore (ideate and prototype); and iii) materialize (test and implement) that comprises six distinct phases between the three step.
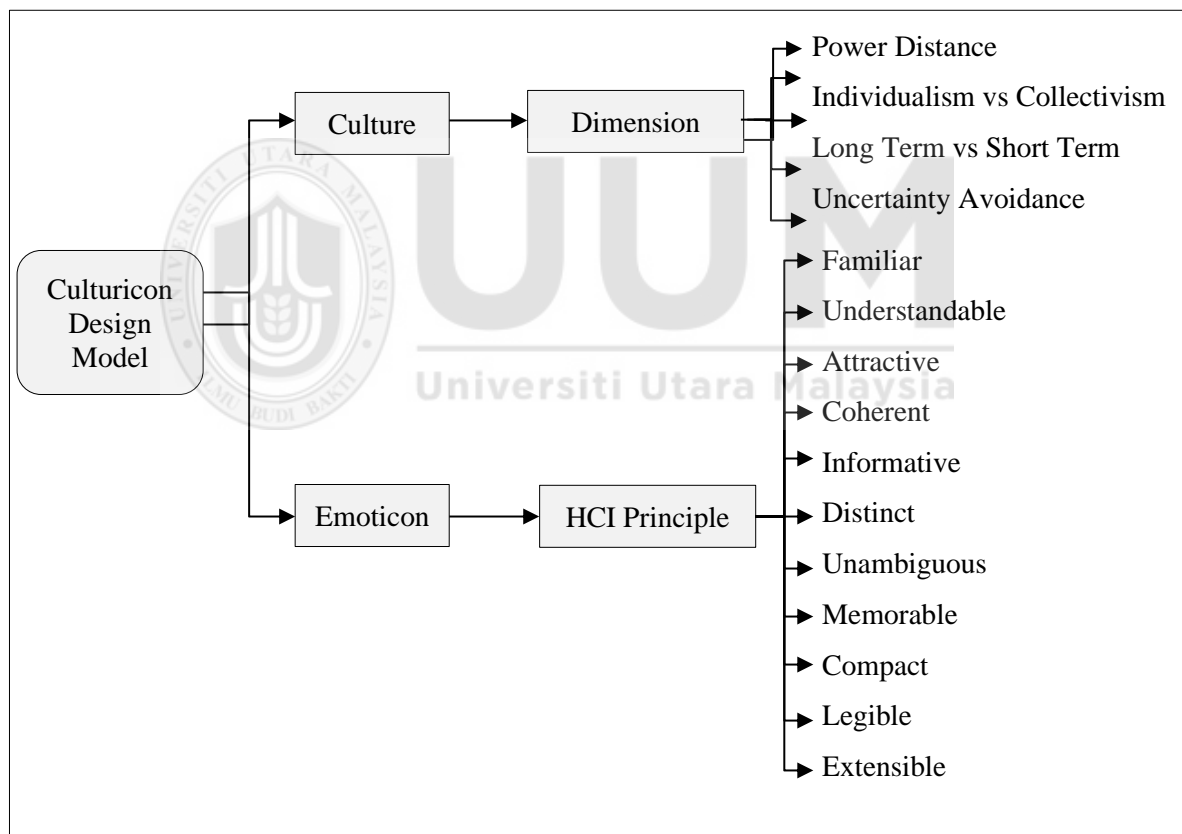
Figure 3.6. Conceptual Model of Culturicon Design Model

In ideate phase, the ideas on how to sketch and develop the model were brainstormed. There are five cultural dimensions included, followed with 11 HCI icon principles.

The design of the model is important to ensure that the user of the model, which is the designer, capable to understand the flow of the model and how to use it. In doing so, several sketches have been made and discussed so that the best design of CDM can be developed. The final design of the model was discussed in Chapter 4. The model then was verified by the experts where the experts are from the HCI background, cultural background, and designer.

At the end of this phase, objective 3 is achieved, which is to design and develop the CDM for designing cultural-based emoticon.

3.5 Phase Four: Model Verification

After CDM was developed, the model was then verified before it can be validated. The verification of the model is done by the experts from the particular domain. Expert review is a methodology based on known user interface design of best practice that use to identify the departures from good design principles and the level of severity for departures.

Expert review also known as heuristic evaluation (Nielsen & Molich, 1990). Nielsen and Molich (1990) explained in their study that expert review is used to identify major usability problems of products. The procedures involve three to five evaluators that independently check a system for violations to well-known usability guidelines. The potential of usability problems is merged into a single master list. After all, the evaluators may suggest the valuable solutions for each problem.

The reason of expert review was chosen for the verification process is because expert review is fast, cheap, intuitive, and easy to motivate people to do it and does not require

107

advance planning (Korhonen, 2010; Nielsen & Molich, 1990). According to Korhonen (2010), the expert review process is fast and can finish within a couple of hours because these experts are knowledgeable and mainly use the functional prototype, low fidelity prototype or even concept and interaction description to conduct the verifications.

Tory and Möller (2005) mentioned in their study that expert review evaluation should be done in the early prototype and follow by end user evaluation after a refinement has been made as both processes will complement within each other. So, in order to ensure the proposed model is high quality, both expert review of verification and end user validation process must be done accordingly. As stated in Section 3.1, the mixed method was chosen for both verification and validation process where the detail explanation is presented in Chapter 4.

3.5.1 Expert selection

In determining the expert to be chosen in expert review evaluations, there are several guidelines that were considered in this study. According to Tory and Möller (2005), the expert chosen must have strong communication skills, have experience in conducting usability inspections, and have experience with the data display. Besides, according to Hallowell and Gambatese (2010), they suggested that the expert must meet the following requirements; (i) authorship; (ii) conference presenter; (iii) member or chair of committee; (iv) employed in practice with five years of experience; and (v) employed as a faculty member at an institute of higher learning.

The number of expert that was chosen should be between three to five persons (Dumas & Sorce, 1995; Nielsen & Molich, 1990). In order to ensure that the result is unbiased,

the chosen experts must be independent from the development team and willing to contribute an honest opinion (Nielsen & Molich, 1990; Tory & Möller, 2005). By following these requirements, the sampling technique applied in this research is purposive sampling technique.

The verification process for CDM involved four HCI experts, two culture experts, two art and design experts, one industry practitioner, and two designers. The HCI and cultural experts are academicians who are the faculty member of an institute of higher learning and practitioner with five years of experience. Meanwhile, industry practitioners and designers have a minimum of five years of experience, as suggested by Rogers and Lopez (as cited in Hallowell and Gambatese, 2010).

A letter of nomination was sent to the chosen experts through email in order to seek their acceptance to participate in the verification process. After the chosen experts gave their approval to participate, an email that consists of the documents verification which include the model and the link for online questionnaire were sent to these experts for verification purposes. If the expert needs more explanation on the verification document, an appointment was made to set up a meeting so that a F2F explanation can be held.

3.5.2 The instrument: Online and Face-to-Face Expert Review

The instruments that were used for verification process is the verification documents along with the online questionnaire and face-to-face discussion. The online questionnaire was used to measure user's understanding and opinion towards the proposed model. If the expert requires extra explanation on the proposed model, an

appointment is made for face-to-face discussion. During the discussion, in addition to providing explanations, the researcher also conducted interview while discussing the subject matter.

The process of interview session was in semi-structured interview, which is one of the qualitative interview types. The reason why the semi-structured interview is chosen for this research is because the researcher wants to acquire richer and more detailed answer from the interviewee.

According to Barriball and While (1994), semi-structured interview is fit to explore the perceptions and opinion that contain sensitive issues and complex points from the respondents. They also stated that semi-structured interview is used when the respondents are mainly coming from different professionals, educations and personal histories as these variations would prevent the standardized interview protocol to happen.

In addition, semi-structured interview is best used when dealing with high level of bureaucrats and elite members of a community, where their time is very limited for appointment interview session and the opportunity need to be used efficiently (Bernard, 2006).

Semi-structured interview involves in-depth, open-ended, and semi-structured questions. Semi-structured interview is a flexible interview where the interviewer provides sets of questions that directly point to specific topics as a guideline to conduct the interview session. Participants were interviewed with similar interview questions, concerning to the variables involved in this study. The questions may not follow the

110

order outlined by interview as the interviewer picks the questions depends on the things discussed by the interviewee (Bryman, Bell, Mills, & Yue, 2011).

The interviewee also has the freedom on how they will reply to the questions. Then, both interviewer and interview are free to follow the new leads regarding the interviewee answers (Bernard, 2006). The lead allows the researcher to continue the interview session without any guidelines, extended the conversations, probing the issue into more critical and clarification, which therefore, develop a keen understanding of the issue understudied.

For this study, these experts as mentioned in sample selection analyzed and verified the proposed model after an email that consist of verification document and the proposed model was sent. There is a hyperlink text that the experts need to click to answer the online questionnaire provided within the verification document. This research used Google Form to create online questionnaire.

The reason why Google Form or online questionnaire were used in this research because of the time limitation for the expert to meet by physical with their tight schedule. By using the online questionnaire, they can answer wherever and whenever they are available within a lesser time requirement in order to complete the questionnaire.

If the expert needs more explanation on the proposed model, an appointment was scheduled to perform a discussion and interview session. The interview sessions were recorded by using mp3 recorder to capture every interviewee's conserved word in

detail so that any important feedback would not be missed. The recorded interviews then were transcribed into transcript during data analysis.

Activity conducted for experts review through online:

1. Researcher sent nomination letter through email to the identified potential experts seeking for their acceptance to participate in the verification process of the proposed model.

2. Researcher sent out the verification form and the documentation describing the proposed model and related information's through email.

3. Experts will review the proposed model and give feedback through the verification form that has been provided.

4. Feedbacks received through email and discussion made through online for further details according to the comments given.

5. Proposed model was modified according to suggestion and comments given by the experts.

Activity conducted for experts review through face-to-face meeting:

1. Researcher sent nomination letters to the identified potential experts seeking for their acceptance to participate in the verification process of the proposed model.

2. Researcher arranged date, time, and venue according to the expert's availability.

3. Researcher presented the overview of the study and the proposed model as well as aim of the study to the experts.

4. Experts start to review the proposed model and question and answer sessions were held to clarify further uncertainties arose.

5. Experts give feedback through the verification forms that have been provided.

6. Reviews from experts are collected and proposed model were modified according to suggestion and comments given by the experts.

The feedback from these experts were taken into consideration and were used as the guidelines for amendments, which could ensure the verified model to be in a good quality. After the amendments were made based on the review and feedback from these experts, second meeting will be held if needed. Figure 3.7 shows the expert verification process followed.
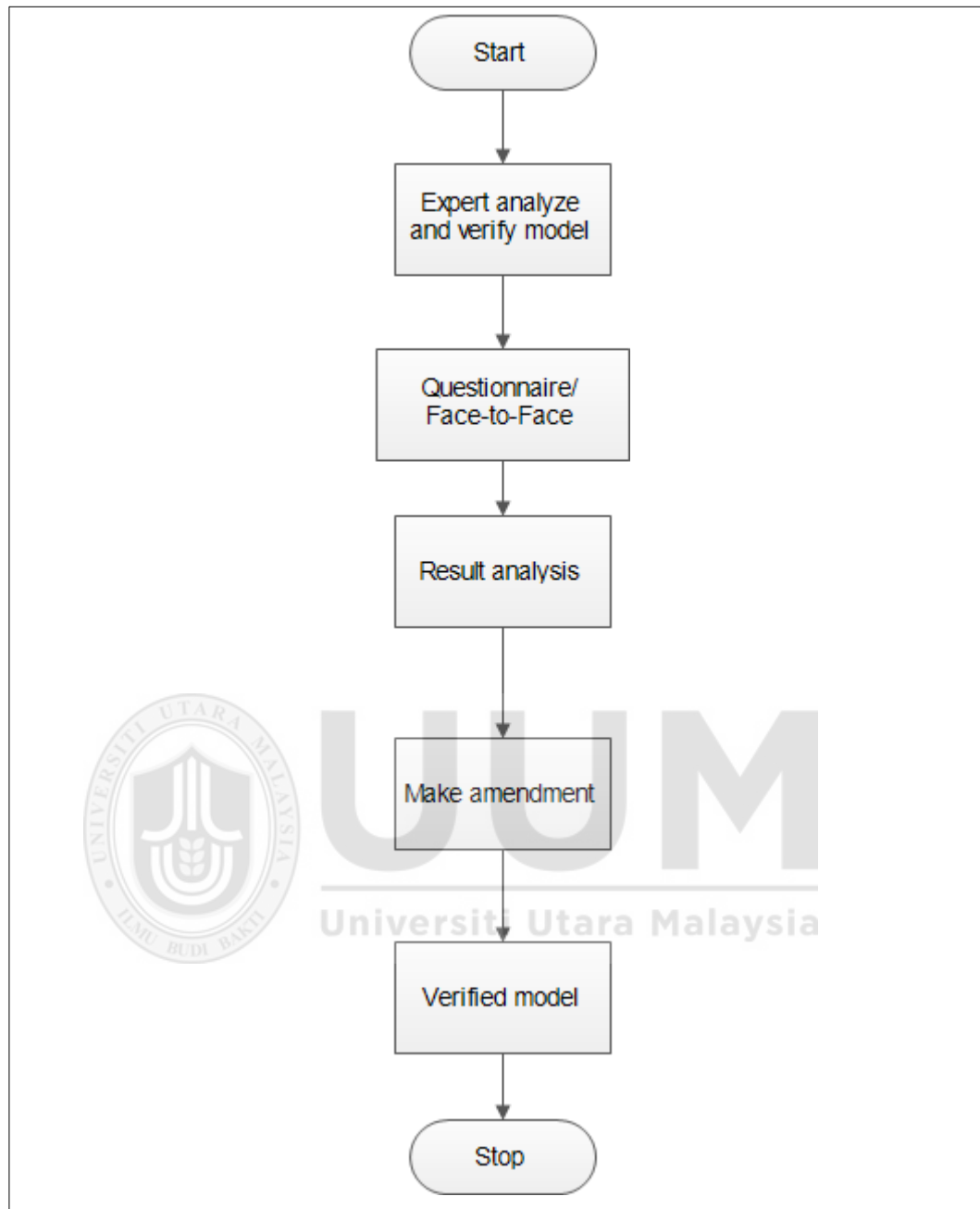
Figure 3.7. Verification process through expert review

3.6 Phase Five: Model Validation

After the amendments were made onto the first draft of the model based on the feedbacks from the experts, the validation process should be carried out to ensure the accuracy and usefulness of the proposed model in CMC. According to Pedersen,

114

Bailey, Allen, and Mistree (2000), validation is a process of building confidence in its usefulness with respect to a purpose. The usefulness means that whether the model is able to provide the design solutions effectively and efficiently or not, the user's expectations are still met. If the model meets user's expectations effectively and efficiently, the model signifies the real-world correctness based on the standpoints of the planned usage (Dubey, et al., 2012; Sommerville, 2007; Tan, et al., 2013). Therefore, the accuracy and usefulness of the model will be examined during the validation process.

As for this study, there are two parts of validation process involved. The first part is validation by the designer. The designer validated the proposed model by using it as the guideline to develop Culturicon. After they used it, they answered the questionnaire provided to perform validation process. The second part is validation by the end user. The end user (teenager) used the sample of Culturicon that were developed by the designer in mobile-messaging application, which in this research is Telegram. Then, focus group discussions were performed to discuss on the usage of the sample of Culturicon based on end user's experience.

3.6.1 Sample selection

For the first part, the proposed model was validated by the designer to develop the Culturicon. The Culturicon were developed based on the Malaysians culture to be the leading sample of Culturicon. To perform validation process, the designer must be employed in practice of designing with five years of experience. Based on this requirement, the sampling technique used to select the designer for validation process

is purposive sampling technique. As a result, five designers were selected to perform in this part of validation.

The second part is end user validation, which was performed through the use of sample of Culturicon and focus group discussions. The target participants for this focus group are Malaysian's teenagers. The purpose for selecting this age group of participants is that teenagers have the highest number of smartphone users when compared to other age groups. (Malaysian Communications and Multimedia Commission, 2018).

Teenagers also dominated on the exploitation of mobile messaging application compared to adults. In addition, Herring and Dainas (2020) stated in their research that age was important in determining which functional interpretations of emoticon respondents preferred. This is because senior adults were more likely to view the emoticon as virtual acts than teenager, and they were more likely to say, "*I don't know*" when they were asked on its meaning.

By having Culturicon as the new type of emoticon containing the elements of culture close to them, it is interesting to gather the feedback and interpretation by the participant. The age of the teenagers was between 15-19 years old and the number of participants are between six to eight people as these numbers are ideal for focus group (Creswell, 2014).

To ensure that the validation by end user run smoothly, the participants must be close or know each other. Hence, snowball sampling technique was used to sample the participants. Snowball sampling is a sampling technique where a researcher identifies

one or two people, but then relies on the initial participants to help classify more study participants.

3.6.2 The instrument: Questionnaire and Focus group

For the first part, which is validation process by designer, the instrument used are validation documents that consist of the proposed model and questionnaire. Figure 3.8 shows the validation process by designer.
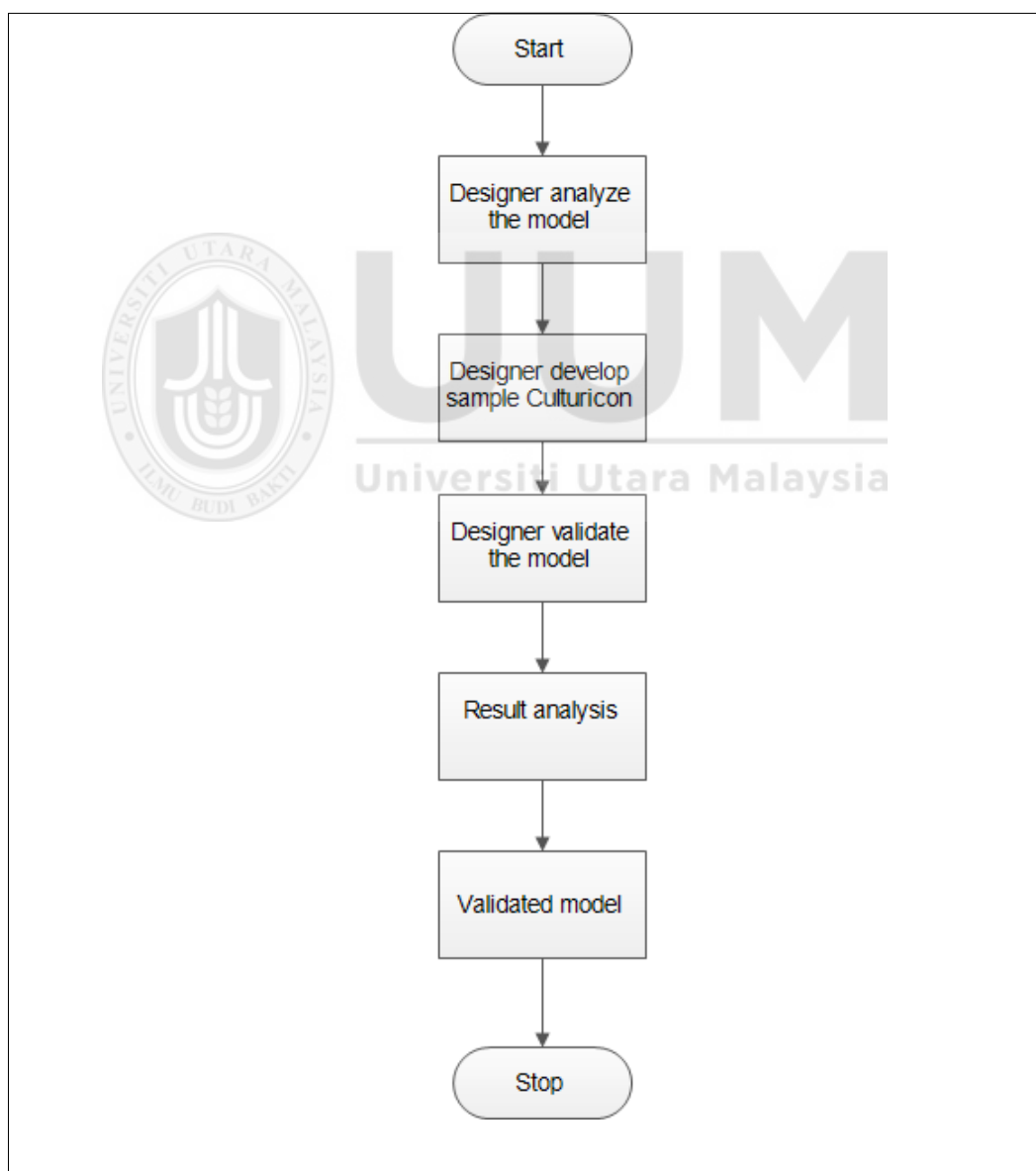
Figure 3.8. Validation process by designer

The designers analyzed the proposed model to understand on the process flow of the model. Then, these designers developed the sample of Culturicon based on the proposed model. They must develop the sample of Culturicon based on the five cultural dimensions provided in the model. After they finished developing the Culturicon, there are questionnaire for them to answer as the process of validation. The sample of Culturicon developed by these designers were then used in the validation by end user.

For the second part, the validation was performed by the end user through focus group approach. Focus group is defined as a carefully planned series of discussions designed to obtain qualitative data and perceptions on a defined area of interest that focused on the particular topic and issue in a permissive and non-threatening environment involving six to seven participants and should not be less than three (Krueger & Casey, 2000; Wilkinson, 2004; Cairns & Cox, 2008; Bryman, 2011). Krueger and Casey (2010) added that focus group is useful in gathering information for summative and formative evaluations especially during the design phases of programs, policies and even evaluations.

Focus group is conducted in a setting where the session leader or moderator ask questions that will be discussed by the participants to collect their various perceptions and opinions (Qudah, Cristea, Shi, & Alqatawna, 2015). During the focus group discussion, participant's perceptions, ideas, and opinions are discussed where the topic would be emphasized in a specific theme and would going to be discussed in depth (Wilkinson, 2004; Bryman, 2011). The moderator need to ensure that the discussion

remains focused on the issue while eliciting a wide range of opinions on that issue (Lunt & Livingstone, 1996).

The answer from the participants might come from the mixture of their personal experience and collective experience of the group ideas. Krueger and Casey (2010) described among the characteristics of focus group include the questions that focus with no right or wrong answer, no push for agreement with nonthreatening and permissive environment along with reasonable group size. During the focus group session, the type of data can be collected including the audiotapes of participants, notes taken by moderator and item recalled by moderator and assistant moderator.

Besides that, focus group is an efficient method of gaining large amount of information and particular opinions and ideas in a short time, and it also economical in obtaining data from multiple participants (Hines, 2000; Krueger & Casey, 2000). According to Lunt and Livingstone (1996), focus group method has speeding up the sampling from one-to-one interview. Compared to performing one-to-one interview session separately, focus group enables the researcher to group all the participants together and interview them at the same time, which hence speeding up the time of the sampling.

In addition, the researcher also able to discover participant's meanings and ways of understanding towards the topic discussed (Lunt & Livingstone, 1996). This can happen because during the focus group session, where the participants might express their personal experiences and opinions especially in an environment that they feel comfortable to do their sharing. The comfortable feeling can come by the

119

characteristics of the focus group itself where there is no push for agreement upon the questions asked.

The different of focus group discussion with personal interview is the way participants react to the view of other participants and build up the view from the unstructured interaction that make it more interesting. The reaction can help in generating new ideas, which hence allowing both individual and interactive opinions to be expressed and discussed (Krueger & Casey, 2010). The researcher then able to drill deeper to attain in-depth insight of the research topic by the new ideas generated from the participant's reactions of the questions asked.

As for this study, a mobile messaging application which is Telegram was used as the platform for user to perform CMC and distributed collective interaction in order to test the sample of Culturicon that were developed by designers in the real world for the purpose of end-user validation. The selected participants performed the CMC type of communication by using Telegram during the process of validation.

Telegram groups were created, and these participants were added into the group. The sample of Culturicon were added in Telegram Stickers section for the participants to use during the interaction session. This method is possible because Telegram enable user to add sticker pack in their sticker selection through @*stickers* bot. Because of this feature, Telegram is the best platform for this study to perform the validation process on the usage of the sample of Culturicon.

A time frame of one week was given to these participants to perform the distributed collective interaction via the Telegram group. They were encouraged to use the sample

of Culturicon that were added in the sticker collection during their collective interaction. After a week, these participants had a meeting to discuss about the sample of Culturicon that they have been used along with CDM itself. The discussions were performed in focus group and the conversation was recorded using mp3 recorder for the purpose of keeping on track of the important things that were discussed.

The moderator started the discussion by asking a set of questions to the participant to give a start-up and a way for new ideas and opinions to be generated during the discussion. Then, the participants may answer and discuss the question either by their personal or collective experience. Their experience and recommendation are noted for future model revision. Figure 3.9 shows the process flow of validation through focus group.
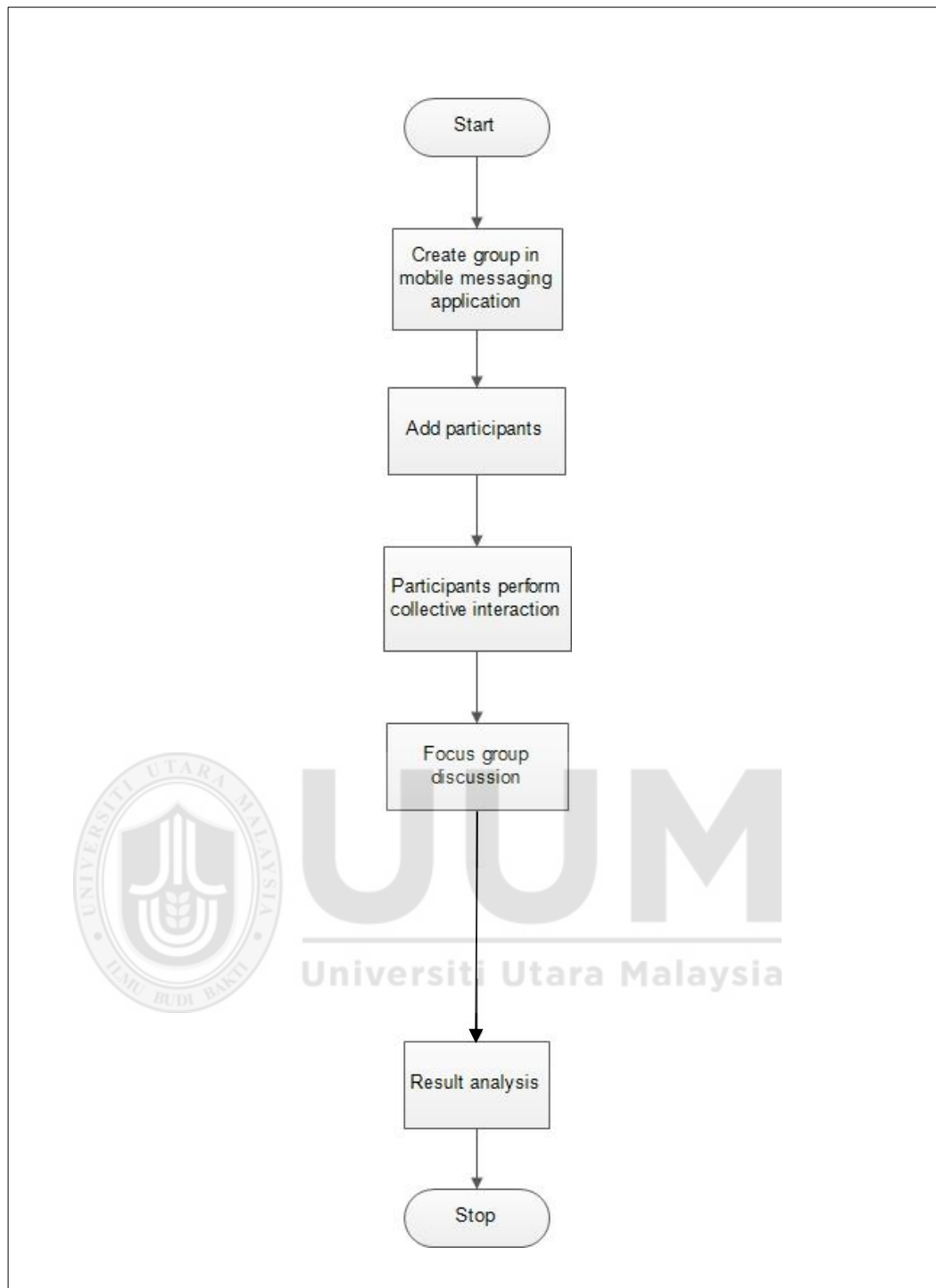
Figure 3.9. Validation process by end user

3.7 Phase Six: Result Analysis and Conclusion

In qualitative research, the data gathered are subjective that come from many types of

data such as interview, audio recording, video, photo, memo etc. As for this study, the

data that came from the interview sessions were audio and video recording, where the

sessions used camcorder and mp3 recorder to record the conversation during the focus groups discussions.

The computer software types that are used to analyze qualitative data is known as Computer Aided Qualitative Data Analysis (CAQDAS). As for this research, Atlas.ti (version 9) was used as the tool to manage and analyze the qualitative data of this study. According to Othman Talib (2011), Atlas.ti is a qualitative software that has a user-friendly interface and make user feel easy to use it. Atlas.ti is capable to code text, image, video, and audio.

Atlas.ti also has the function to "drag & drop" to make link between the codes and create visual model through network. The processes that involved during result analysis were the field data collection, data transcription, data checking, thorough reading for text overview, data coding, data categorization, theme creation, interpretation setting and report preparation. Figure 3.8 shows the focus group validation's process flow. Objective 4 is achieved at the end of this phase, which is to validate the CDM through the validation by the designer and validation by the end user.

3.8 Chapter Summary

This chapter discusses about the method that is used in this study. This study applied the six phases according to the flow in a way to develop a model for cultural-based emoticon. The five phases would be theoretical study, identify cultural dimensions, design and develop the model, model verification and model validation. In the theoretical study phase, the research gap was acquired through the CLR and questionnaire survey. The CLR was used to gather research gap on previous studies

while the questionnaire survey was used to gather the feedback from the end user in real world. Based on these methods, it was found that there is a lack of study regarding cultural-based emoticon and there were demands for it to be implemented from the end user. Then, HCI icon principles were reviewed to be the component of the proposed model. Objective 1 was achieved at the end of this phase.

In identify cultural dimensions phase, three culture dimensions were reviewed which are Hall culture model, Trompenaars and Hampden-Turner culture model and Hofstede culture model. Based on the review, it is found that there are similar categorizations between these three model's dimensions. The chosen dimensions are discussed in Chapter 4. At the end of this phase, objective 2 was achieved.

In design and develop phase, the model was develop based on the chosen HCI icon principles and cultural dimensions. The process of design adapted the ideate phase from the design thinking method by Nielsen. The draft model was then verified by the experts to ensure that the model was developed correctly.

Based on the feedback by these experts, amendments were made to develop the final version of CDM hence achieving objective 3. In model validation phases, there are two phases involved which are validation by designer and validation by end user.

Validation by designer was performed to ensure the CDM is helpful to the designer, which is the user of the model. While the validation by end user was performed to ensure that the product created from the model is helpful and useful to end user. The results were then analysed in result analysis and conclusion phase. Objective 4 was achieved at the end of this phase.

CHAPTER FOUR
CULTURICON DESIGN MODEL

4.0 Introduction

Based on the literature review in Chapter Two, it is found that there is a lack of models for emoticon design, especially from the cultural perspective. Focusing on this gap, the current study was conducted with the aim of proposing a culture-based emoticon design model, specifically known as the Culturicon Design Model (CDM). The CDM can be used as a guideline to design emoticons with the element of culture according to the HCI icon design principles. With that, this chapter discusses the development process of the model, including the process of designing, developing, and verifying the CDM.

4.1 Design of Culturicon Design Model

As previously discussed in Chapter Three, this study employed the ideate phase of the design thinking method by Nielsen. The ideate phase of the explore method was adapted. In particular, several sketches and design were brainstormed, where the cultural dimensions and HCI icon design principles represent the core elements of the model. The brainstorm started from a central idea that was then refined and narrowed down to the best model design.

The design phase is the crucial part of a study because the design needs to be balanced between the theoretical and practical perspectives. Although designers serve as users of the model, this model also contribute to the existing body of knowledge in HCI, which explains why both perspectives should be considered.

125

Culturicon is used to represent the element of culture in the forms of emoticons, emoji, or stickers. In particular, CDM incorporates two categories: cultural and icon categories. In the cultural category, the cultural dimensions from the cultural model were considered to determine the element of culture that needs to be embedded in the emoticon. Meanwhile, in the icon category, the HCI icon design principles were used to determine the design of the emoticon. The integration of these two categories represents the main components of the model. The following subsections present the justifications for the selected cultural dimensions and HCI icon design principles.

4.1.1 Justifications for Cultural Dimensions

Currently, no specific models have been developed for emoticon design, especially from the cultural perspective. Addressing this, this study considered cultural dimensions with respect to the findings of previous studies. Three cultural models were chosen as the key references for this study: (1) Hall culture model, (2) Trompenaars and Hampden-Turner culture model, and (3) Hofstede culture model. These models were chosen because they were used in previous HCI studies on culture.

As Hall culture model introduces the cultural concept on how a message is stored and flows, studies have suggested the tendency of Asian countries to possess high context (HC), instead of low context (LC), suggesting that the message contains implicit information with deep meaning (Eune & Pyo, 2009; Karreman & Romeo, 2016; Miehle et al., 2016).

For the cultural dimensions based on the three cultural models discussed in Chapter Two, previous studies identified the following dimensions for Asian countries: power distance (Gould et al., 2000; Heimgärtner, 2017; Hofstede, 2011; Karreman & Romeo,

2016), individualism versus collectivism (Eune & Pyo, 2009; Gould et al., 2000; Heimgärtner, 2017; Karreman & Romeo, 2016; Miehle et al., 2016; Oh & Moon, 2011), long-term versus short-term relationship (Gould et al., 2000; Heimgärtner, 2017; Karreman & Romeo, 2016), masculinity versus femininity (Heimgärtner, 2017; Oh & Moon, 2011), and uncertainty avoidance (Gould et al., 2000; Heimgärtner, 2017; Karreman & Romeo, 2016).

As mentioned in Chapter Two, these cultural dimensions belong to the Hofstede culture model. Since these dimensions also belong under the same classification with the dimensions of the Hall culture model and Trompenaars and Hampden-Turner culture model (as described in Table 4.1), this study chose to apply the dimensions of the Hofstede culture model given its popularity among these three models (Balan & Vreja, 2013; Ishak & Jaafar, 2016; Oshlyansky, 2007).

There are several reasons to the popularity of the Hofstede culture model. Firstly, its framework is rather extensive and presents essential demographic, geographic, economic, and political indices of a society in meaningful relationships (Kale & Barnes, 1992). Secondly, Hofstede's works have been widely cited as the most influential and popular theory of cultural types (Søndergaard, 1994) and experimentally proven through replications (Shackleton & Ali, 1990).

Besides that, Hofstede's culture model has been noted as "a watershed conceptual foundation for many subsequent cross-national research endeavours" and "the beginning of the foundation that could help scientific theory building in cross-cultural research" (Fernandez, Carlson, Stepina, & Nicholson, 1997). Furthermore, the Hofstede culture model has constantly proven to be useful in cross-cultural and

international studies. (Donthu & Yoo, 1998; Furrer, Ching Liu, & Sudharshan, 2000; Mattila, 1999; Patterson & Smith, 2001). Last but not least, Hofstede's cultural dimensions are highly relevant in explaining cross-cultural behaviour (Prasongsukarn, 2009).

Table 4.1

Dimension of Culture Models

Classification	Hall culture model	Trompenaars and Hampden-Turner culture model	Hofstede culture model
Possession or power in society	Territoriality	Achievement/ ascription	Power distance
Relationship between people	Association	Individualism/ communitarianism	Individualism/ collectivism
Importance of time	Temporality	Sequential/synchronic relation to time	Long-term/short-term orientation
Reaction to law	Defence	Universalism/particularism	Uncertainty avoidance
Difference in gender	Bisexuality	–	Masculinity/ femininity

Based on the data of several studies, Asian countries were reported to possess high power distance (Gould et al., 2000; Hofstede, 2011; Karreman & Romeo, 2016; Heimgärtner, 2017). For instance, Gould et al. (2000) and Heimgärtner (2017) reported that Asian countries possess high power distance due to their focus on collective and social goals that help them to trust the organisation and develop a relationship with the organisation. As for Malaysians specifically, they want to know who is in charge of the organisation and how it is staffed due to their strong sense of

128

national pride (Gould et al., 2000). Similarly, Karreman and Romeo (2016) reported that Chinese people are highly influenced by authority, and inequality among people are commonly accepted.

As for the dimension of individualism/collectivism, the findings of previous studies were found inconsistent. Several prior studies suggested that Asian countries possess high collectivism (Gould et al., 2000; Karreman & Romeo, 2016; Miehle et al., 2016; Heimgärtner, 2017), while certain studies suggested that Asian countries possess high individualism instead (Eune & Pyo, 2009; Oh & Moon, 2011). Nevertheless, more recent studies have suggested high collectivism among Asian countries, which established the assumption of the current study for this dimension. Gould et al. (2000) identified the preference of Asian people to work in groups and establish strong ties among one another, particularly Malaysians. Views on high collectivism among Asian countries and Asians' tendency to make decision in relation to their obligations to family or other groups were supported by Miehle et al. (2016), Karreman and Romeo (2016), and Heimgärtner (2017).

As for the dimension of long-term/short-term relationship, Gould et al. (2000), Heimgärtner (2017), and Karreman and Romeo (2016) agreed on the tendency of Asian countries to establish long-term relationship. Gould et al. (2000) revealed that Malaysians require longer time to develop relationship and feel satisfaction, while Karreman and Romeo (2016) reported that Chinese people values taking the time to build life-long relationships due to their HC and collectivistic culture.

As for the dimension of masculinity/femininity, Oh and Moon (2011) found that Asian countries, such as Japan, China, India, and Indonesia, demonstrate high masculinity.

However, other studies found that Asian countries possess moderate masculinity (Gould et al., 2000; Heimgärtner, 2017). As the difference between both findings only slightly differ, this study assumed moderate masculinity/femininity for the consideration of the model.

As for the final dimension, a number of studies demonstrated low uncertainty avoidance among Asian countries (Gould et al., 2000; Karreman & Romeo, 2016; Heimgärtner, 2017). Karreman and Romeo (2016) noted low uncertainty avoidance among Asians, as it appears that they are comfortable with ambiguity and tend to adhere to the laws and rules. After all, the Asian population strictly applies adherence and respect to culture.

Following the identification of cultural dimensions for CDM, the next step involves identifying the traits for each dimension to develop CDM in detail. The identification of these traits is discussed in Section 4.2.1.

4.1.2 Justifications for HCI Icon Design Principles

 As discussed in Chapter Two, there are several principles in designing icon. Previous studies proposed a total of 12 principles, where nine principles were discussed in multiple studies. Table 4.2 summarises the principles in designing icon. The most discussed principle among these studies is familiar (nine studies). This is followed by understandable, attractive, and coherent (five studies), informative and distinct (four studies), unambiguous (three studies), memorable and compact (two studies), and lastly, legible, few, and extensible (one study).

130

Table 4.2

Principles in Designing Icon

Principle	Sources
Familiar	Lin (1992); Horton (1997); Kurniawan (2000); Chen (2003); Heim (2007); Chiu (2012); Lan (2013); Islam (2016)
Understandable	Horton (1997); Chen (2003); Chiu (2012); Lan (2013); Islam (2016)
Attractive	Lin (1992); Horton (1997); Chiu (2012); Lan (2013)
Coherent	Lin (1992); Horton (1997); Beason (2005); Lan (2013); Islam (2016)
Informative	Lin (1992); Horton (1997); Chiu (2012)
Distinct	Horton (1997); Kurniawan (2000); Chen (2003); Islam (2016)
Unambiguous	Lin (1992); Horton (1997); Islam (2016)
Memorable	Horton (1997); Chiu (2012)
Compact	Lin (1992); Horton (1997)
Legible	Horton (1997)
Few	Horton (1997)
Extensible	Horton (1997)

As discussed in Section 2.1.3, these principles are proved to be crucial in designing icon. For this study, the principles of familiar, understandable, attractive, coherent, informative, distinct, unambiguous, memorable, compact, legible, and extensible were selected for the development of the culture-based emoticon design model.

The principle of few was excluded because these principles were found not critical for the proposed model in this study. The objective of the model in this study was to develop efficient and effective icons, regardless of the number of icons to be

131

developed. Therefore, the principle of *few* was deemed unnecessary for this study, as the number of necessary icons to be developed was not measured for the model.

4.2 Development of Culturicon Design Model

As for the development of CDM, the core components are the cultural dimensions and HCI icon design principles. Adapting the design process proposed by Kaneko et al. (1991), as mentioned in Section 2.1.3, this study incorporated the four key steps to design the Culturicon. The first step (functional decision) involves identifying the system where the developed icons are intended to be used, which in this case, the mobile messaging application. There are many types of icons for various functions. As for this study, the function of the developed Culturicon is to represent the element of culture in the form of icon for the mobile messaging application.

In the second step (object selection), the designer selects objects that represent the intended icons. Based on the proposed model, objects were selected according to the identified cultural dimensions. The designer proceeds to select cultural elements to be used as cultural representatives in the mobile messaging application.

For the third step (object design), the designer designs the icon appearance. In this step, the designer refers to the HCI icon design principles. All principles must be adhered to the development of an efficient Culturicon.

The final step involves creating icons. The designer proceeds to create the Culturicon based on the chosen cultural dimensions and HCI icon design principles. The cultural dimensions determined the required cultural elements, while the HCI icon design principles determined the interface or look of the created icons. Based on these design

132

process, several sketches were made and reviewed before the development of the final design of the model. There were two final design versions of the model in this study: the main version (Figure 4.1) and detail version (Figure 4.2) of CDM.

As presented in Figure 4.1, the main version of this circular model in this study consists of three layers that represent the cultural dimensions, HCI icon design principles, and the Culturicon. The outer layer that represents the cultural dimensions in this study consists of the following dimensions: power distance, collectivism, uncertainty avoidance, masculinity/femininity, and long-term relationship.

As the development of this model focuses on Asian countries, the level of each cultural dimension reflects the Asian culture, which include high levels of power distance (Gould et al., 2000; Hofstede, 2011; Karreman & Romeo, 2016; Heimgärtner, 2017) and collectivism (Gould et al., 2000; Karreman & Romeo, 2016; Miehle et al., 2016; Heimgärtner, 2017), moderate level of masculinity/femininity (Gould et al., 2000; Heimgärtner, 2017), low level of uncertainty avoidance (Gould et al., 2000; Karreman & Romeo, 2016; Heimgärtner, 2017), and long-term relationship (Gould et al., 2000; Karreman & Romeo, 2016; Heimgärtner, 2017).

For the design of the Culturicon, either one or multiple (combination of) cultural dimensions from this layer in this model can be selected. The cultural dimensions represent the core elements of the design of the Culturicon, which serve as a guide for the designer to express the element of culture by the traits of these dimensions.

Following the selection of the cultural dimensions, the study proceeded to establish the second layer that represents HCI icon design principles. This middle layer of the

133

model consists of 11 principles, as previously discussed in Section 4.2.2. Unlike the outer layer, where the designer can choose either one or multiple dimensions, all principles in this middle layer must be fulfilled for the design of the Culturicon. These principles also serve as a guide for the designer to come out with a good design of the Culturicon, specifically the interface of the Culturicon.

Lastly, the centre of the model represents the Culturicon itself. This is the first draft design of the CDM.
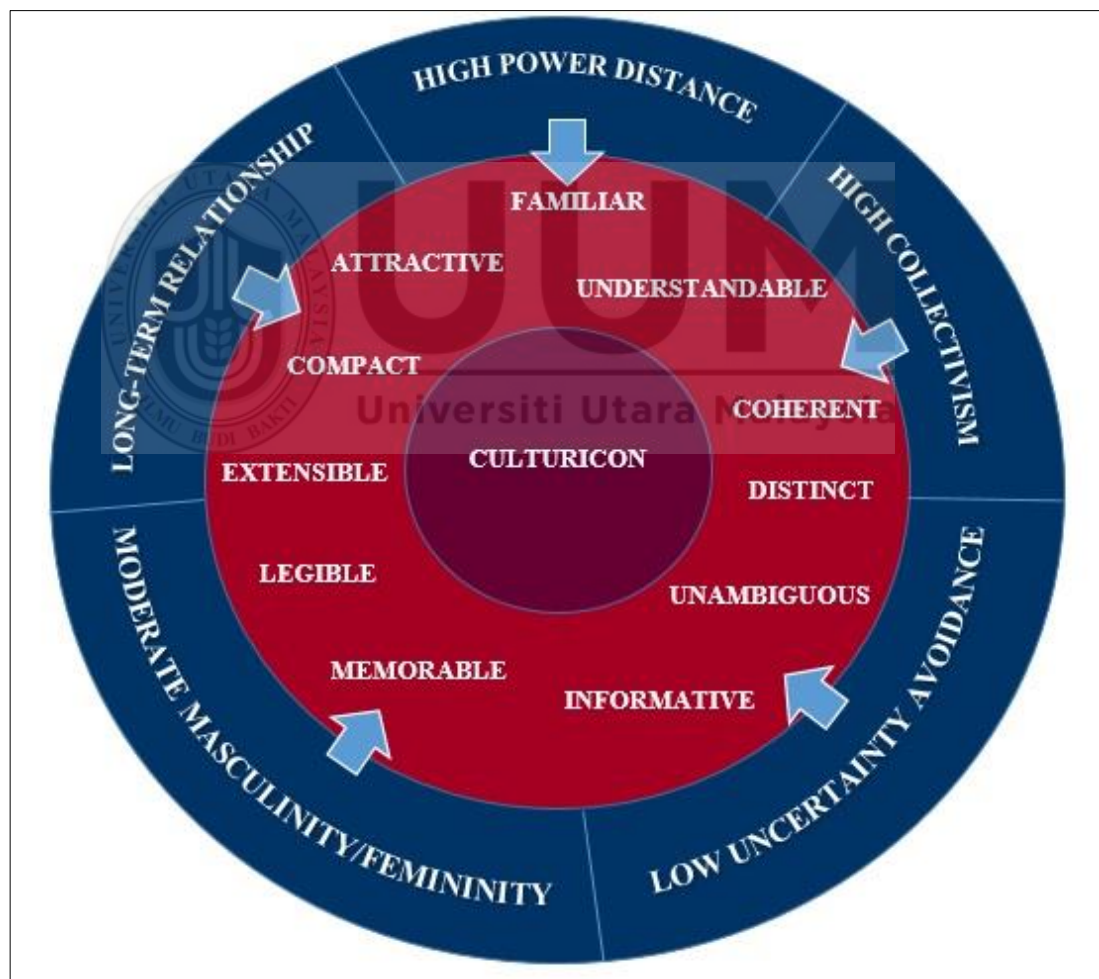
Figure 4.1. Main Version of the Culturicon Design Model
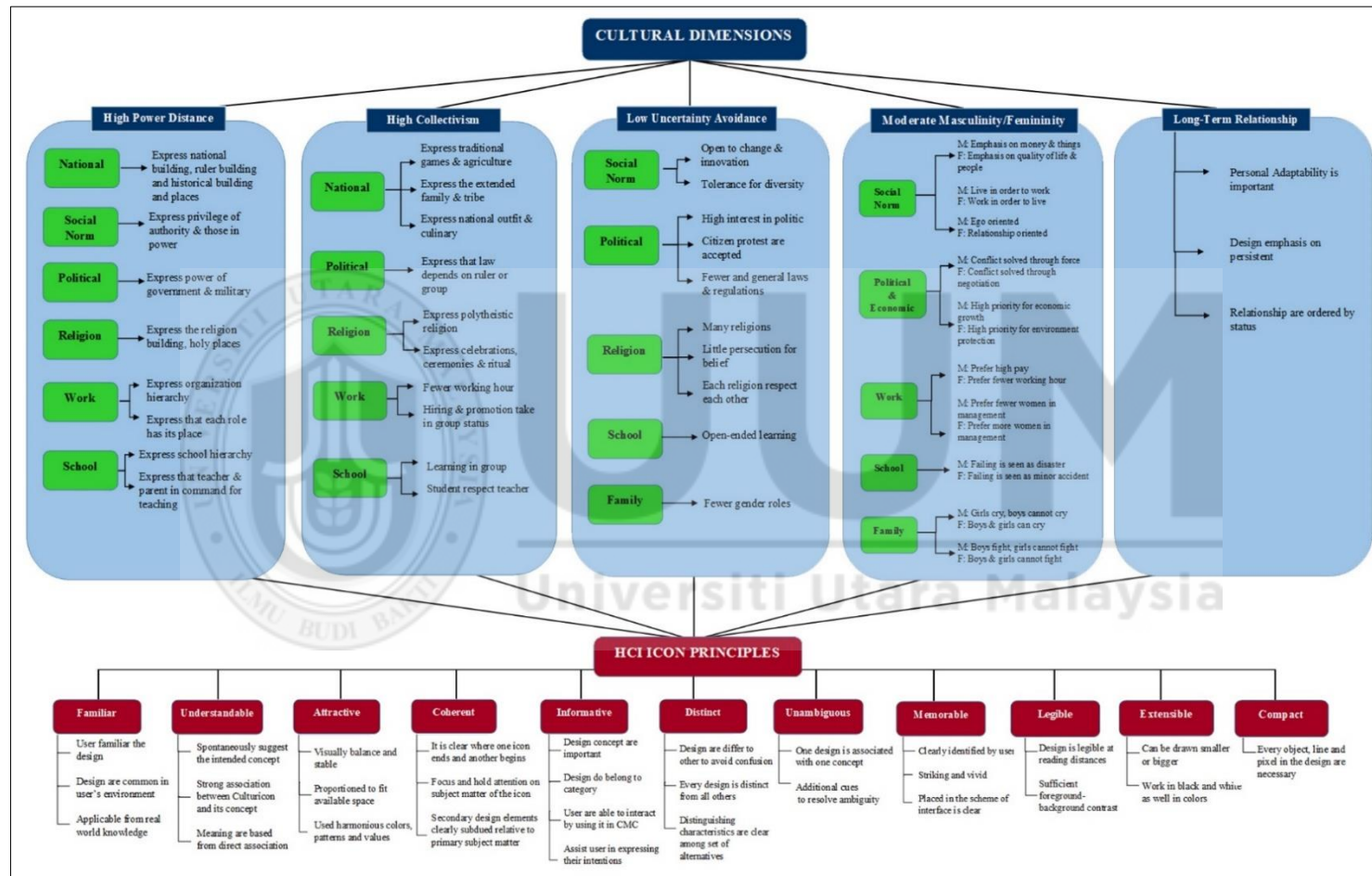
Figure 4.2. Detail Version of the Culturicon Design Model

135

As presented in Figure 4.2, the detail version of the CDM displays additional information of the cultural dimensions and HCI icon design principles. These details provide better understanding of the model. The detail version of the CDM is further discussed in the following subsections.

4.2.1   Cultural Dimensions

Five cultural dimensions were selected: high power distance, high collectivism, low uncertainty avoidance, masculinity/femininity, and long-term relationship. Each dimension has specific cultural elements for each category of trait: national, social norm, political, economic, religion, work, school, and family traits. These traits serve as a guide in narrowing down the cultural elements for the design of the Culturicon.

For this model, only the dimension of long-term relationship does not have any specific category of trait because there is no specific direction to be pointed within this dimension. The traits of these cultural dimensions in this study were adapted from Hofstede (2011). Hofstede (2011) described traits for each cultural dimension in detail, which can be used to determine the (high or low) level of the cultural dimensions. As listed in Table 4.3, these traits help to narrow down the cultural elements for the design of the model.

136

Table 4.3

Cultural Dimensions of the CDM

Dimension	Definition	Category	Traits
High power distance	How a society deals with the level of status and social power	National	Express national building, ruler building, and historical place
		Social norm	Express privilege of authority and those in power
	For high power distance, the decision making is centralised to management and superior.	Political	Express power of government and military
		Religion	Express religion buildings and holy places
		Work	Express organisational hierarchy
			Express that each role has its place
		School	Express school hierarchy
			Express that teachers and parents are in command for teaching
High collectivism	Individuals are strongly incorporated into groups of family that continue to protect them in exchange for loyalty.	National	Express traditional games and agriculture
			Express the extended family and tribe
			Express national outfit and culinary
		Political	Express that law depends on the ruler or group
		Religion	Express polytheistic religion
			Express religion celebration, ceremonies, and rituals
		Work	Fewer working time
			Hiring and promotion take in group status.
		School	Learning in group
			Students respect teachers.
Low uncertainty avoidance	The willingness to take risks and have more experimentation and innovative behaviour	Social norm	Open to changes and innovationl
			Tolerance for diversity
		Political	High interest in politics
			Citizen protests are accepted.

Table 4.3 continued

		Religion	Fewer and general laws and regulations Many religions Little persecution to belief Each religion respects each other.
		School	Open-ended learning
		Family	Fewer gender roles
Moderate masculinity (M)/ femininity (F)	The distribution of values between genders that is considered as a fundamental issue in society	Social norm	M: Emphasis on money and things F: Emphasis on quality of life and people M: Live in order to work F: Work in order to live M: Ego-oriented F: Relationship-oriented
		Political and economic	M: Solve conflict using force F: Solve conflict through negotiation M: High priority for economic growth F: High priority for environmental protection
		Work	M: Prefer high pay F: Prefer fewer working hours M: Prefer fewer women in management F: Prefer more women in management
		School	M: Failing is seen as disaster. F: Failing is seen as minor accident.
		Family	M: Girls can cry; boys cannot cry. F: Boys and girls can cry. M: Boys fight; girls cannot fight. F: Boys and girls cannot fight.
Long-term relationship	The extent to which the society focuses on the future as opposed to the past and present; promotes virtues and persistence and focus on future rewards		Personal adaptability is important. Design emphasis on persistence Relationships are ordered by status.

138

4.2.1.1 High Power Distance

High power distance denotes the strength of the society's social hierarchy, specifically on the extent to which the less powerful members of the organisations and institutions accept and expect unequal distribution of power (Hofstede, 2011). The traits of high power distance are categorised according to national, social norm, political, religion, work, education, and family.

For the national category of high power distance, the needed traits include elements of high power distance of the country in the national context, specifically national buildings that show the greatness of the country (e.g. Kuala Lumpur Convention Centre and Kuala Lumpur Tower), ruler building (e.g. Putrajaya government's building), and historical place (e.g. A Famosa, Kellie's Castle, and Dataran Merdeka). These traits express the power or greatness of the country.

For the social norm category of high power distance, the needed traits include elements of power that occurs in the social context, specifically the privilege of authority and those in power. For example, a police officer has the authority over the citizens. These traits express the power of authority that is capable of controlling and ruling the citizens.

For the political category of high power distance, the needed traits denote the power of the government and military, specifically the hierarchy in government and military that reflects the power of the governing body of the country. The political elements can be expressed in the form of symbolical icons of the ministries and departments of the government and the rankings in the military department, such as the commandant, captain, lieutenant, and soldier.

139

For the religion category of high power distance, the needed traits are expressed as religion buildings, such as mosques for Muslims, Chinese temples for Chinese, and Hindu temples for Indians. These traits denote the power and privilege of religions in the form of icon. After all, there are various races and religions in Malaysia.

Meanwhile, the work and school category of high power distance are generally similar. The only difference between both categories lies in the institution involved. The work category involves the relationship between the employer and employee, while the school category involves the relationship between the teacher and student.

For the work category of high power distance, the needed traits include the hierarchy within the work institution, such as the boss, the secretary, and the officer. For the school category of high power distance, the needed traits include the hierarchy within the school institution (e.g. the principal, the teacher, and the student), the hierarchy in school and curriculum (e.g. the hierarchy in school clubs and sports), and the expression that teachers and parents are in command for teaching purpose.

4.2.1.2 High Collectivism

High collectivism implies high consideration for family and specific groups at the individual level (Hofstede, 2011). The traits of high collectivism are categorised according to national, political, religion, work, and school.

For the national category, high collectivism can be expressed through traditional games and agriculture, extended family and tribe, and national outfit and culinary. Traditional games, such as congkak, wau bulan, batu seremban, and gasing, can be used as symbolic elements for the respective icon. Meanwhile, traditional agriculture,

140

such as paddy, palm oil, banana, rubber, and cocoa, can be embedded in the Culturicon.

Besides that, as for the traits of extended family and tribe, there are emoticons for father, mother, son, daughter, grandfather, and grandmother, which can be expanded to uncle, aunt, cousin, nephew, and other extended family members. The same notion applies to tribe member. Malaysia consists of many tribes, such as Kadazan, Dusun, Iban, Bidayuh, and many more. These traits can be used to introduce members of different tribes in Malaysia.

Furthermore, Malaysia consists of various races with their own outfit and culinary. For examples, Malays are represented by outfits of baju melayu, baju kurung, baju kebaya, and kain batik and different types of food that includes nasi lemak, nasi kerabu, nasi dagang, and ketupat; outfits like cheongsam and samfoo and different types of food like Hokkien mee, kolo mee, wonton mee, and Ipoh white coffee represent Malaysian Chinese; outfits like saree, kurta, and dhoti and different types of food like thosai, thandoori chicken, putu mayam, and murtabak represent Malaysian Indian.

The political category of high collectivism denotes that the law depends on the ruler or group. In this case, Malaysia is a democratic country, where the government chosen through a general election is responsible for the implementation of rules, laws, and regulations. This trait shows that Malaysians collectively agree to follow the rules, laws, and regulations that have been set up by the ruling government.

141

The religion category of high collectivism expresses the celebrations and ceremonies that are celebrated in Asian countries. Malaysia is a country with several religions. There are three major religions in Malaysia, which are Islam, Buddhism, and Hinduism. These three religions are rich with celebrations and ceremonies.

For Islam, the celebrations include Eid al-Fitr and Eid al-Adha. For Buddhism, the celebrations include Chinese New Year and Wesak. Meanwhile, celebrations for Hinduism include Deepavali and Thaipusam. These celebrations and ceremonies are useful when they are expressed through icons in CMC, especially during the time of celebrations. Postcards are traditionally used to express and celebrate the joy of these celebrations. However, in this CMC era, the creation of icons for these celebrations are in demand and can be very useful.

For work category of high collectivism, there are two traits: fewer working hours and hiring and promotion take in group status. Hofstede (2011) stated that countries with high collectivism tend to have shorter working hours. Besides that, the hiring for a job or promotion is determined based on the status of the group, not by individual performance.

As for school category, high collectivism can be expressed by learning in group and students respecting their teachers. Students in countries with high collectivism tend to study in groups (Hofstede, 2011). Students being respectful to teachers accurately reflects Asian customs and manners towards individuals who teach or mentor them.

4.2.1.3 Low Uncertainty Avoidance

Uncertainty avoidance is the extent of the members of cultural programmes in coping with anxiety by minimising uncertainty (Hofstede, 2011). Low uncertainty avoidance is the willingness to take risks and have more experimentation and innovative behaviour. The traits of low uncertainty avoidance are categorised according to social norm, political, religion, school, and family.

The social norm category of low uncertainty avoidance can be expressed by showing the openness of people to changes and innovation. This suggests that people do not just want to live in their comfort zone. They can accept changes in the way they live as well as new innovations. This also leads to the second trait, which is tolerance to diversity. As there are various races and religions in Malaysia, tolerance is highly important to ensure that individuals of all races and religions can live together in harmony.

The political category of low uncertainty avoidance is expressed by having high interest in politics, citizen protest is accepted, and practising fewer general laws and regulations. As a democratic country with the practice of freedom of speech, Malaysians tend to have high interest in politics, especially during the general election, and accept citizen protests. Everyone has the right to voice their opinion. This proves the validity of the traits for low uncertainty avoidance for Asian countries, including Malaysia. Furthermore, countries with low uncertainty avoidance have fewer and general laws and regulations (Hofstede, 2011).

The religion category of low uncertainty avoidance includes the openness culture that allows the practice of many religions in the country. Such openness leads to little persecution for belief as well as each religion respect each other's.

The school category of low uncertainty avoidance is expressed through open-ended learning. This implies that the education system for low uncertainty avoidance is not restricted to rules or instructions. Education takes place by learning the customs of ancestors and life experiences.

The family category of low uncertainty avoidance suggests fewer gender roles. In other words, the differences in the gender roles are not obvious—men can perform the roles of women, and vice versa.

4.2.1.4 Moderate Masculinity/Femininity

The dimension of masculinity/femininity denotes the distribution of values between genders that is considered as a fundamental issue in society. In this case, Asian countries tend to possess a moderate level of masculinity/femininity, which suggests that most Asians treat men and women equally. The traits of moderate masculinity/femininity are categorised according to social norm, political and economic, work, school, and family.

The social norm category of moderate masculinity/femininity consists of three traits. Firstly, male emphasis on money and things; female emphasis on quality of life and people. This implies that men often consider how to earn more money to improve their life, while women prioritise safety and harmony of life. Secondly, male live in order to work, while female work in order to live. In relation to the first trait, men live to

work in order to earn more for living, while women work in order to improve their quality of life. Thirdly, male is ego-oriented, while female is relationship-oriented. This implies that men decide according to their ego, while women decide according to their relationship.

There are two traits for political and economic category of moderate masculinity/femininity. Firstly, male solve conflict through force, while female solve conflict through negotiation. This suggests the preference of men to use aggression to solve conflict or dispute and the preference of women to negotiate or compromise to solve conflict or dispute. Secondly, male prioritise economic growth, and female prioritise environmental protection. This trait is quite similar to the trait for the social norm trait of this dimension.

There are also two traits for the work category of this dimension. Firstly, male prefer high pay whereas female prefer fewer working hours. Men prefer high pay given their emphasis on economics. Women want to spend more time with their significant others, which explains their preference for shorter working hours. The second trait for this category involves the preference of male for fewer women in management and the preference of female for more women in management.

The school category of moderate masculinity/femininity consists of the following trait: male see failing as disaster whereas female see failing as minor accident. This means that the outcome of failure affects men more than how the outcome of failure affects women.

There are two traits of the family category of moderate masculinity/femininity. Firstly, for male, girls can cry whereas boys cannot cry; for female, both boys and girls can cry. Secondly, for male, boys can fight whereas girls cannot fight; for female, both boys and girls cannot fight.

4.2.1.5 Long-Term Relationship

The dimension of long-term relationship denotes the extent to which the society focuses on the future as opposed to the past and present. As for this dimension, Asian countries tend to value long-term relationship. There is no specific category for this dimension, only traits are represented for long-term relationship.

Firstly, personal adaptability is important. This means that Asians take longer time to adapt to any relationship, as long as the relationship remains healthy. As for the second trait, Asians emphasise persistence. That explains why they prefer long-term relationship as long as the relationship persists. Thirdly, relationships are ordered by status. This means that the way they treat the relationship depends on the status of the partner they are dealing with; the greater the status, the better they treat the partner.

In short, as the proposed model was intended to facilitate designer on the design of the Culturicon, the study first considered the cultural dimensions before proceeding to the subsequent phase. In the initial phase, five cultural dimensions that are relevant to the Culturicon were identified. The selection of traits from these dimensions can be one trait or more traits, depending on the purpose of the designer, which in this case, for the mobile messaging application. The identified cultural dimensions help to narrow

down the scope of the design and determine the specific categories of the intended design by focusing on the categories and traits provided for each dimension.

4.2.2 HCI Icon Design Principles

After the initial phase that involved identifying the cultural elements needed for the final design, the study proceeded to fulfil all HCI icon design principles. A total of 11 principles were identified and fulfilled in order to develop the design of the Culturicon. These principles were selected to comply with the required specifications from the HCI design perspective. There are specific criteria for each principle, which provide a better understanding of the required principles. The criteria for this study were adopted from the icon design principles by Horton (1997).

Table 4.4

HCI Icon Design Principles of the CDM

Principle	Criteria
Familiar	User familiar the design.
	Design is common in user's environment.
	Applicable from real world knowledge.
Understandable	Spontaneously suggest the intended concept.
	Strong association between Culturicon and its concept.
	Meaning is based from direct association.
Attractive	Visually balance and stable.
	Proportioned to fit available space.
	Used harmonious colors, patterns, and values.
Coherent	It is clear where one icon ends and one begins.

	Focus and hold attention on subject matter of the icon.
	Secondary design elements clearly subdued relative to primary subject matter.
Informative	Design concept are important.
	Design do belong to category.
	Users are able to interact by using it in CMC.
	Assist user in expressing their intentions.
Distinct	Design is differ to each other to avoid confusion.
	Every design is distinct from all others.
	Distinguishing characteristics are clear among set of alternatives.
Unambiguous	One design is associated with one concept.
	Additional cues to resolve ambiguity.
Memorable	Clearly identified by user.
	Striking and vivid.
	Placed in the scheme of interface is clear.
Legible	Design is legible at reading distances.
	Sufficient background-foreground contrast.
Extensible	Can be drawn smaller or bigger.
	Work in black and white as well in colors.
Compact	Every object, line and pixel in the design are necessary.

4.2.2.1 Familiar

For the familiar principle, there are three criteria to be fulfilled for the design of the Culturicon: (1) users are familiar with the design; (2) design is common in the users'

environment; (3) applicable from real-world knowledge. The first criterion implies that users can effortlessly recognise the design at a glance in order to know what the design means.

Meanwhile, the second criterion means that the design exists in the users' environment. In other words, the design is well-known to the users. The final criteria needed for the design of the Culturicon suggests the applicability of the design in CMC as the representation from the real-world knowledge.

4.2.2.2 Understandable

For the understandable principle, there are also three criteria to be fulfilled for the design of the Culturicon: (1) spontaneously suggest the intended concept; (2) strong association between the Culturicon and its concept; (3) meaning is based from direct association. The first criterion suggests that users can spontaneously understand the concept of the design.

The second criterion means that the concept that the Culturicon intends to express is strong and does not cause any vague understanding from the users. The final criterion means that the concept is expressed in a straightforward manner with no other meaning or intention that can confuse users.

4.2.2.3 Attractive

For the attractive principle, the criteria to be fulfilled for the design of the Culturicon include the following: (1) visually balanced and stable; (2) proportioned to fit the available space; (3) use harmonious colours, patterns, and values. The criterion of

visually balanced and stable means that the design should have appropriate height and width.

Meanwhile, the second criterion implies means that the design fits the required specifications in the creation of Culturicon for mobile messaging application. The criterion of using harmonious colours, patterns, and values suggests that the usage of these visual attributes should not be too bright or dark.

4.2.2.4 Coherent

For the coherent principle, there are three criteria to be fulfilled for the design of the Culturicon: (1) it is clear where one icon ends and one begins; (2) focus and hold attention on the subject matter of the icon; (3) secondary design elements are clearly subdued in relative to the primary subject matter. The first criterion implies the need to group the design of the emoticons according to the cultural dimensions. As a result, the created Culturicon are placed in specific groups that represent the corresponding cultural dimensions accordingly.

Meanwhile, the second criterion denotes the focus of the created Culturicon on the intended cultural dimensions. The design must be clear on the cultural dimensions it represents. The final criterion describes the need to ensure the correlation between the secondary design elements with the primary subject matter. The design for the secondary elements is used as an enhancement or extended version of the primary elements.

4.2.2.5 Informative

For the informative principle, the criteria to be fulfilled for the design of the Culturicon include the following: (1) design concept is important; (2) design does belong to the category; (3) users are able to interact by using it in CMC; (4) assist users in express their intention. The criteria of design concept are important means to ensure that the elements of the design of Culturicon are meaningful and useful for users to use in CMC.

The second criterion implies that the design belongs to the intended cultural dimensions. The model assists the designer to determine the dimensions the design belongs to. The third criterion implies that the design offers information and can be understood among CMC users, while the final criterion means that the design of Culturicon can help users to express what they want to say via symbolic images (Culturicon).

4.2.2.6 Distinct

For the distinct principle, the criteria to be fulfilled for the design of the Culturicon include the following: (1) design is different from other designs to avoid confusion; (2) every design is distinct from other designs; (3) distinguishing characteristics are clear among the set of alternatives. The first two criteria ensure that the design is different from other designs to avoid confusion among users and prevent any conflicting design aspects. The final criterion means that the differences in design must be clear in the case of any second element of the design.

4.2.2.7 Unambiguous

For the unambiguous principle, the criteria to be fulfilled for the design of the Culturicon include the following: (1) one design is associated with its concept; (2) additional cues to resolve ambiguity. The first criterion suggests that the design has a clear concept on what dimensions it belongs to. Meanwhile, the second criterion means that the design has additional information (e.g. texts) for users to understand the meaning of the design clearly.

4.2.2.8 Memorable

The memorable principle consists of the following criteria: (1) clearly identified by users; (2) striking and vivid; (3) placed in the scheme of interface is clear. The first criterion indicates that users can recognise the Culturicon and understand the meaning of the Culturicon after they use them for the first time. The second criterion means that the design is attractive and lively. In other words, the design is memorable to users. The third criterion means that the design of Culturicon is recognisable clearly.

4.2.2.9 Legible

For legible principle, the criteria are as follows: (1) design is legible at reading distances; (2) sufficient background-foreground contrast. The first criterion ensures that the Culturicon can be recognised at reading distances, which range from 15 to 25 inches from the eyes. The Culturicon must not be too small or big for users. The second criterion means that the colour should be contrasting enough for users to differentiate the background from the foreground.

4.2.2.10   Extensible

For extensible principle, the criteria are as follows: (1) can be drawn smaller or bigger; (2) work in black and white as well in colours. The first criterion indicates that the size of the design can be extended or reduced as long as it meets the requirements of the mobile messaging application. However, the design still needs to apply the legible principle too. The second criterion denotes the flexibility of the design, where the design can be in any colour but still meets the requirements of both *legible* and informative principles.

4.2.2.11   Compact

The compact principle consists of the following criterion: every object, line, and pixel in the design are necessary. This means that every detail of the design is needed and informative. For that, any details that are not necessary for the design are excluded.

The study proceeded to develop the Culturicon after all 11 HCI icon design principles in this phase were fulfilled. The cultural dimensions and HCI icon design principles discussed in Section 4.3.1 and Section 4.3.2 represented the first draft of the model. Experts were appointed to verify the validity of the developed model. The verification process is discussed in the next section.

4.3   Model Verification through Expert Review

Expert review was conducted to verify the proposed CDM in this study. The method involved in expert review verification is mixed method, by applying the convergent parallel mixed method design. Convergent parallel mixed method design is the method where the researcher collects both quantitative and qualitative data concurrently,

153

analyses them separately and then compare the overall results (Creswell, 2014). Figure

4.3 shows the process of convergent parallel mixed method design.
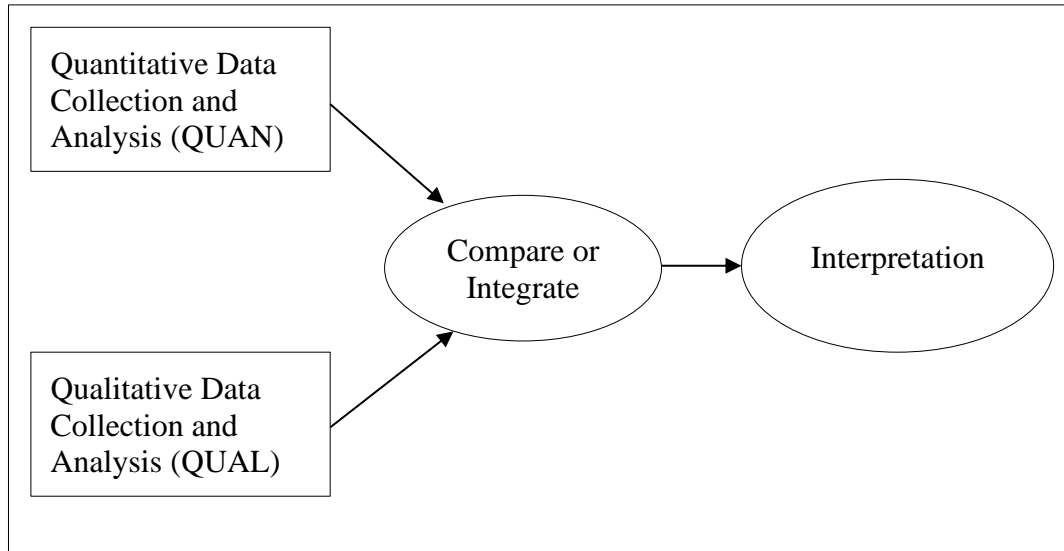
According to the diagram, both quantitative and qualitative data were collected

concurrently. Following the collection of both data sets, the data was analysed

separately. In other words, both data collected are independent from each other. The

results of both datasets were then merged to compare them. Finally, an interpretation

was performed.

For the model verification, the main aspects included the usage of appropriate cultural

dimensions, including categories and traits, followed by the HCI icon design

principles and the corresponding criteria as well as the overall CDM in terms of

connection, flow, and readability.

The model in this study consisted of two phases, namely the phases of cultural

dimensions and HCI icon design principles. Therefore, experts in the domains of HCI,

UX, culture, arts, and design were identified to verify the model. The selection criteria of experts were discussed in Section 3.6.1.

Overall, the verification process of CDM in this study involved a total of 11 experts: four HCI experts, two culture experts, two arts and design experts, one industrial practitioner, and two designers. Nielsen and Molich (1990) suggested that three to five experts are sufficient enough to perform the evaluation process, which reaffirmed the adequacy in the number of experts for the verification process in this study. Table 4.5 describes the background of the selected experts.

Table 4.5

Background of Experts

Area	Expert (E)	Academic Qualification	Expertise	Current Position	Years of Experience
HCI	E1	PhD	Educational multimedia, persuasive multimedia learning environment, and user experience (UX)	Senior lecturer	10
	E2	PhD	User experience (UX) and virtual heritage	Senior lecturer	18
	E3	Master's degree	HCI, multimedia, and 3D Modelling and digital illustration	Lecturer	6
	E4	Master's degree	IT management and HCI	IT officer	9
Culture	E5	PhD	Arts and socio-culture	Lecturer	12
	E6	Master's degree	Arts and culture	Lecturer	10
Arts and Design	E7	PhD	User emotion and perception on design aesthetics	Senior lecturer	7
	E8	Master's degree	Fine arts department	Lecturer	8

155

Table 4.5 continued

Industrial Practition er	E9	Bachelor's degree	System development	System develop er	10
Designer	E10	Bachelor's degree	Graphic design	Graphic designe r	7
	E11	Bachelor's degree	Industrial and graphic design	Graphic designe r	5

For the model verification, these experts were required to complete an online questionnaire. They were also required to provide comments and suggestions. A meeting for face-to-face discussion with the experts were arranged and recorded to clarify any unclear comments and suggestions for the model verification.

As shown in Appendix H, the questionnaire, which was adapted from Aziz (2015) and Arif (2011), was used as the main instrument for model verification. Apart from a section for experts to provide comments and suggestions, they were also required to provide their expert review for the following:

1. The relevance of the proposed cultural dimensions and HCI icon design principles

2. The understandability of the elements for the cultural dimensions

3. The understandability of the elements for HCI icon design principles

4. The connections and flows of all components

5. The readability of the proposed CDM

For the first question, experts were required to verify the relevance of the proposed components, cultural dimensions, and HCI icon design principles by selecting one of the following choices: (1) all proposed components are relevant; (2) some components may not be relevant; (3) all components are not relevant. As for the second and third questions, experts were required to verify the understandability of the elements for the cultural dimensions and HCI icon design principles by selecting one of the following choices: (1) it is easy to understand; (2) need some explanation; (3) need very detailed explanation.

Meanwhile, for the fourth and fifth questions, experts were required to verify the connections and flows of all components and the readability of the proposed CDM by answering "yes" or "no". Finally, based on their expert knowledge and experience, they were required to provide comments and suggestions regarding the proposed CDM. The results of model verification are discussed in the next subsection.

4.4   Results of Model Verification

The model verification process, as previously stated, included a total of five questions. These five questions were broken down into three sections. The first section focused on the overall model's verification results, while the second section focused on the cultural dimensions' verification results. Meanwhile, the third section focused on the results of the HCI icon design principles verification.

4.4.1   Quantitative Results

Table 4.6 presents the results of the overall model verification. For the cultural dimensions, a total of seven experts (64%) agreed that all proposed components are relevant, while four experts (36%) indicated that some components may not be

157

relevant. Meanwhile, for the HCI icon design principles, a total of nine experts (82%) agreed that all proposed components are relevant, and only two experts (18%) indicated some components may not be relevant.

Table 4.6

Verification Results of the Overall model

Parts	Frequency (n = 11)		
	All proposed components are relevant	**Some components may not be relevant**	**All components are not relevant**
Cultural Dimensions	7	4	-
HCI Icon Design Principles	9	2	-

Table 4.7 presents the verification results of the cultural dimensions. As this was only the first draft, the feedback on the irrelevance of several components was deemed understandable. In particular, nine experts (82%) agreed that it is easy to understand the components of high power distance, while two experts (18%) indicated that some components of high power distance need some explanation.

For high collectivism, six experts (55%) agreed that it is easy to understand its components, while five experts (45%) stated that its components need some explanation. For low uncertainty avoidance, six experts (55%) agreed that it is easy to understand to understand its components; four experts (36%) indicated that its components need some explanation; one expert (9%) stated that its components need very detailed explanation.

For moderate masculinity-femininity, seven experts (64%) agreed that it is easy to understand its components; three experts (27%) indicated that the components need some explanation; one expert (9%) stated that its components need very detailed explanation. Lastly, for long-term relationship, five experts (45%) agreed that it is easy to understand its components; four experts (36%) indicated that the components need some explanation; two experts (18%) stated that its components need very detailed explanation.

Table 4.7

Verification Results of Component in Cultural Dimensions

Components	Frequency (n = 11)		
	It is easy to understand	**Need some explanation**	**Need very detail explanation**
High power distance	9	2	-
High collectivism	6	5	-
Low uncertainty avoidance	6	4	1
Moderate masculinity/femininity	7	3	1
Long-term relationship	5	4	2

Table 4.8 shows the verification results of the HCI icon design principles. For familiar, understandable, and memorable, nine experts (82%) agreed that it is easy to understand its components, while two experts (18%) indicated the need for some explanation. For attractive, informative, and compact, 10 experts (91%) agreed that it is easy to understand, while one expert (9%) indicated the need for some explanation.

For distinct and unambiguous, eight experts (73%) agreed that it is easy to understand, while one expert (9%) indicated the need for some explanation. Two experts (18%) indicated that the components need very detailed explanation. For coherent, six experts

159

(55%) agreed that it is easy to understand, while five experts (45%) indicated the need for some explanation.

For legible, seven experts (64%) agreed that it is easy to understand, while four experts (36%) indicated the need for some explanation. Lastly, for extensible, nine experts (82%) agreed that it is easy to understand, while one expert (9%) indicated the need for some explanation. One expert (1%) indicated that the components need very detailed explanation.

Table 4.8

Verification Results of Component in HCI Icon Principles

Component	Frequency (n = 11)		
	It is easy to understand	Need some explanation	Need very detail explanation
Familiar	9	2	-
Understandable	9	2	-
Attractive	10	1	-
Coherent	6	5	-
Informative	10	1	-
Distinct	8	1	2
Unambiguous	8	1	2
Memorable	9	2	-
Legible	7	4	-
Extensible	9	1	1
Compact	10	1	-

As part of the model verification process, experts also provided comments and suggestions regarding the proposed model from their perspectives. Figure 4.4 and Figure 4.5 illustrate their expert feedback of the overall model. As shown in Figure 4.4, 10 experts (91%) agreed that the connections and flows of the model are logical, while one expert (9%) disagreed. In other words, the components of the model are

well-connected and in a correct flow. Meanwhile, as depicted in Figure 4.5, 10 experts (91%) agreed on the readability of the model, while one expert (9%) disagreed. In other words, almost all experts can read and understand the model.
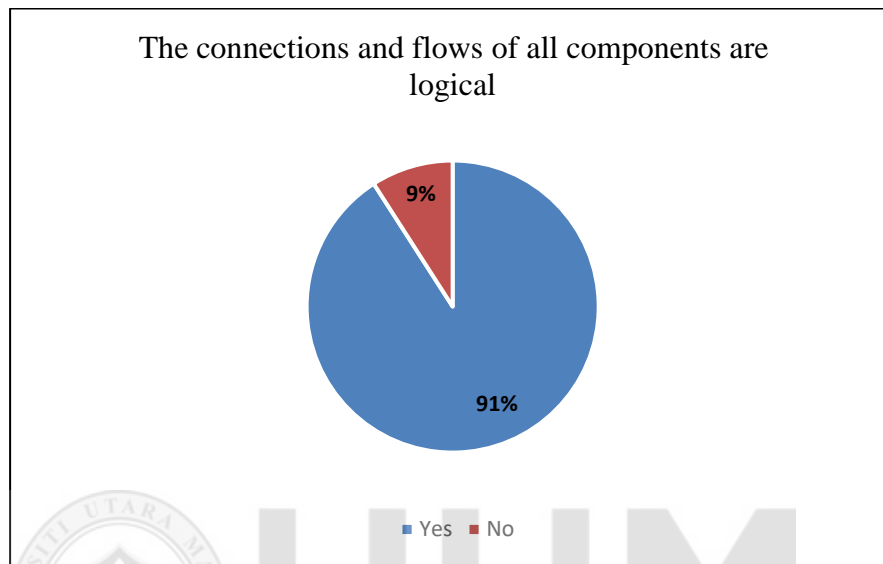
Figure 4.4. Expert Feedback of Connections and Flows of the Overall Model
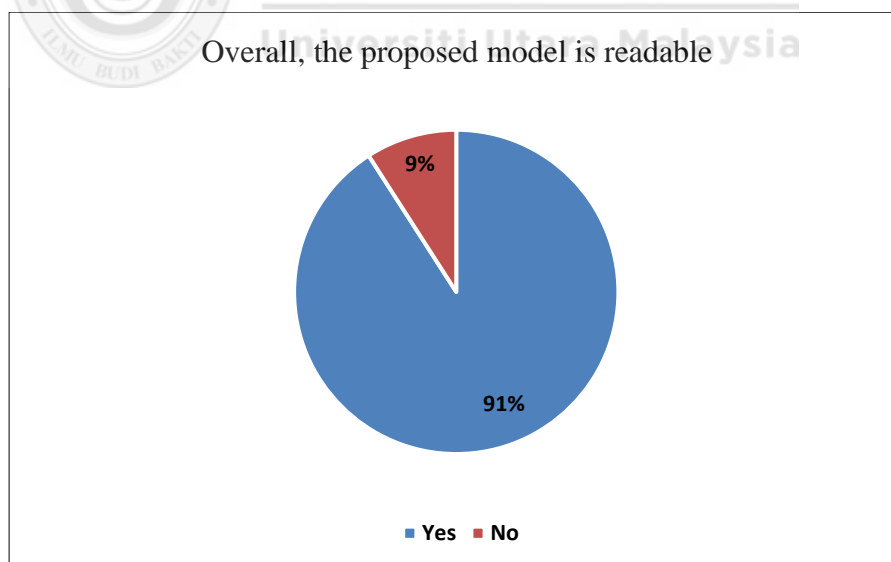
Figure 4.5. Expert Feedback of Model Readability

According to Clarke and Warwick (2001), if an item scores at least 60%, on average, the possibility of significant outcome is higher and can be considered. The cultural dimensions of high collectivism, low uncertainty avoidance, and long-term relationship and the HCI icon design principle of *coherent* scored slightly below than 60%, while the remaining cultural dimensions and HCI icon design principles scored more than 60%.

Based on the results, the cultural dimensions of low uncertainty avoidance, moderate masculinity/femininity, and long-term relationship recorded feedback that need very detailed explanation, which was deemed understandable. The traits from these cultural dimensions may not directly reflect the culture in Malaysia because the traits were selected based on the findings of prior studies that focused on the Asian countries, not only for Malaysia. Thus, certain traits may be incompatible with Malaysian culture.

For the final section, experts were asked to make any comments or suggestions about CDM. The comment and suggestion from the online questionnaire and face-to-face discussions were analysed together by using thematic analysis. The face-to-face discussions that were recorded using mp3 recorder were transcribed into transcripts.

4.4.2   Qualitative Results

In determining the theme of the analysis, inductive coding approach was conducted. Inductive coding approach is a method analysis that start with read the transcript, followed by determining the data segments and giving the code. Finally, themes were established based on the group of the codes with same category. The established themes are *problem*, *component*, and *model's flow.* Table 4.9 presented the qualitative

data analysis that comprise of themes, code and the comments and suggestions from these experts.

Table 4.9

Qualitative Data Analysis

Themes	Code	Expert	Comments and Suggestions
Problem	Problem_Agree	E5	We had to use the emoticons that followed their desire, because they are the designer.
			That's why not many people around the world know about our culture even though we are rich with culture. Most of the culture in social messaging apps are from the western culture. if we can put our culture together, it would be good. I agree that we need this model.
		E6	Overall are good and interesting
		E7	At this stage, the description explained in words and it will be interesting when designer begin to sketch the icon represent the cultural-based. However, I agreed with the proposed model and it will be interesting to see the findings.
Component	CDimension_ PowerDistance	E5	For Work and Political category in Power Distance, put the traditional and modern type because we have that traditional and modern element. The way they dress are different between traditional and modern. Include also the ruler and the people who were being ruled.

Table 4.9 continued

		For School, we can include the relation between teacher and student, how they react to each other.
	E7	High Power Distance is correct especially in Political Category. For example, the royal institution of Thailand, their authority is high.
		Religious and belief, school hierarchy, just like our country.
CDimension_ Collectivism	E5	National outfit and culinary are okay.
		For us Malay Muslim, we don't have ritual anymore. Because ritual usually is about inappropriate things. Need to reconsider on ritual.
		Traditional games and agriculture are okay. There are a lot of things can be design, whether the popular one or the unpopular one. Depend on designer which one to be introduced.
		Custom and rule need to be included. Because custom and rule are the law of conduct in culture. There are things that we are not supposed to do and things that we can do. So that people can be loyal and respect to society. We can put this into Social Norm category.

Table 4.9 continued

		Hiring and promotion take in group status need to reconsider.
CDimension _ UncertaintyAvoidance		Uncertainty avoidance is how we accept changes. For example, like our dress code. We have acculturated the way we dress, the way we learn and the way we learn from Westerners without leaving our own way. We can adapt.
		Citizen protests are accepted need to reconsider. Maybe, government changes are accepted.
		Religion is okay, each religion respect each other is okay. I can imagine how to design it.
		Fewer gender roles also okay.
CDimension _ Masculinty/Femininity	E5	Regarding gender, the moderate level is accurate with our culture. Need to balance between masculinity and femininity. Role in culture norm is important.
		For environment protection, not only limited to environment, can be expanded to our life. Can show the relation between mother and children, wife and husband.
		Girls cry, boys cannot cry. Boys and girls can cry okay. In our culture of masculinity context, we must show that boys are tough. Boy must be strong and protective
		Boys fight girls cannot fight, boys and girls cannot fight also okay.

Table 4.9 continued

	CDimension _ LongTermRelationship		This is acknowledged. Our society is like that. It is okay. Tell on how we adapt own actions and adapt with other people.
	General	E1	There are too many components provided in the model. All these components are needed in developing the Culturicon? Need to enlarge the font size.
		E5	The scope of the culture is broad. The model needs to be more focused and precise towards the culture it wants to express.
		E11	Some components need explanation, as they are hard-to-understand and interpreted into graphical elements.
Model's flow	Layout_design	E7	My first impression on the main model, the flow of the model is confusing. It is round shape and the arrow also not specific. I don't know where to start first. Adjust by adding process flow can be helpful.
		E8	The round shape model is quite confusing. Need to provide a better workflow for a better understanding. Some of the design principles possess similar meaning.
		E10	Is there any process flow?

Table 4.9 continued

	Mandatory/ optional_component	E1	Perhaps need to reconsider to identify the mandatory and optional components of the model in order to create the culturicon. This model is perhaps significant in creating the culturicon. However, further amendments are needed to improve this model such as follow: i) provide simple OD or legend for each component, ii) provide relationship between the components to show clear connections and flow of the model.
	Subcategory_ standardization	E5	Is there a need to standardize the subcategory so that every dimension has the same subcategory?

For the theme of Problem, there is Problem_Agree code. This code was established to capture the feedback from experts that agreed with the problem issued in this research. Expert 5 stated that we are currently required to use emoticons designed by these designers, even if they do not correspond to our culture. As a result, our culture is becoming less well-known, while westerners' cultures are becoming more well-known. Hence, expert 5 expressed her agreement regarding the need for the CDM in implementing our culture in mobile messaging application. Experts 6 and 7 also agreed with the proposed model and expressed interest in seeing the results. Based on the comments by these experts, it can be said there the proposed model is needed to solve the problem issued.

167

The second theme is Component, that comprised of code General, CDimension_PowerDistance, CDimension_Collectivism, CDimension _UncertaintyAvoidance, CDimension _Masculinity/Femininity, and CDimension _LongTermRelationship. For the General code, expert 1 stated that there are too many components provided in the model and inquired whether all of these components are required. She also stated that the fonts should be made larger.

Meanwhile, expert 5 stated that the scope of the model is broad and that it needs to be more focused and precise towards the culture that the model wants to express. Expert 11 adds comments of this code by stating that some components need explanation because they are difficult to understand and interpreted into graphical elements. Based on these comments, changes are needed on the components of the model.

For CDimension_PowerDistance code, expert 5 stated that the Work and Political category can be designed in terms of traditional and modern type because our culture possesses both type, such as the dress and who are the ruler and who are being ruled. She added that for School category can be used to express the reaction between student and teacher.

Meanwhile, expert 7 agreed on a high level of power distance in Asian countries by referring to Thailand's royal institution. He stated that their authority is extremely high. He also agreed that the traits of religion and belief, as well as school hierarchy, reflect the culture of our country.

For CDimension Collectivism, expert 5 agreed on the national outfit and culinary as there are many Culturicon that can be produced from these traits. The same can be

168

said about traditional games and agriculture. Expert 5 suggested that the ritual be removed because Malay Muslims no longer practise rituals. Aside from that, including ritual is inappropriate because culture must be represented by a positive and good element.

To solve this, expert 5 suggested to add custom and rule in social norm category. This is due to the fact that in our culture, custom and rule are the law of conduct. It can include both what we are permitted to do and what we are not permitted to do. Besides that, hiring and promotion take in group status need to be reconsidered as it did not reflect with our culture.

For the CDimension _UncertaintyAvoidance, expert 5 agreed with the low uncertainty avoidance as our culture can accept changes. She gave an example of accepted changes, such as the way we dress and eat, that were acculturated from Western culture. She also agreed on the traits in religion category and the trait fewer gender roles. For the trait citizen protest are accepted, she suggested to change to government changes are accepted.

For the CDimension _Masculinity/Femininity, expert 5 agreed with the moderate level of masculinity and femininity. She stated that masculinity and femininity need to be balanced. She also suggested expanding the female trait of environmental protection to include not only the environment, but also our daily lives.

169

For the last code for component theme which is CDimension _LongTermRelationship, expert 5 agreed that it relates with our culture. It can demonstrate on how we adapt our own actions and adapt with other people.

Another theme is Model's Flow where it possesses the Layout_design code, Mandatory/Optional_component code and Subcategory_Standardization. In Layout design code, expert 7 commented that the model's flow is confusing. He stated that when referring to the model, he is unsure where to begin. He also mentioned that the round shape and arrow used are not specific, as expert 8 commented. They suggested that a process flow be provided for a better understanding.

For the Mandatory/optional_component, expert 1 suggested to identify the mandatory and optional components of the model in order to create the Culturicon. She agreed that the proposed model is important in the development of Culturicon, but it needs to be improved by including an operation design or legend for each component, as well as a relationship between components to show clear connections and flow of the model.

For the Subcategory_standardization code, expert 5 suggested standardising the subcategory for all dimensions because the current subcategory is not standardised. Some dimensions, for example, have a social norm category, whereas others do not. Based on the comment, the model should be revised so that all dimensions have the standardise subcategory.

All expert's comments and suggestions were taken into account when the model was modified, notably for cultural dimensions and HCI icon design principles that scored

less than 60%. These recommendations and suggestions were carefully considered, and the model was modified properly.

4.4.3 Analysis of Results

In compare or integrate analysis, the side-by-side approach (Creswell, 2014) was performed to compare the data from quantitative and qualitative. Table 4.10 below shows the mixed-method comparison analysis.

Table 4.10

Dimension of Culture Models

Components	Quantitative	Qualitative
General	Cultural dimension- 64% HCI Icon Principle- 82%	Too many components. Scope needs to be focus. Some components need explanations.
Model's flow	91%	Add process flow Add mandatory and optional components. Provide relationship between components. The round shape model is quite confusing. Need to provide a better workflow for a better understanding. Some of the design principles possess similar meaning. Standardize the subcategory.

Table 4.10 continued

Power distance	82%	Experts suggested to include modern and traditional type of Culturicon especially for Work and Political Category.
		Experts also stated that the culture element is correct especially category of Political, religion and school
Collectivism	55%	Expert agreed with national outfit and culinary, traditional games and agriculture.
		Expert suggested to add custom and rule under social norm category
		Consider hiring and promotion trait
Uncertainty avoidance	55%	Expert agreed that we have acculturate the culture, meaning we can accept changes.
		Experts agreed on religion and fewer gender roles
		Citizen protest trait need to change with government changes are accepted.
Masculinity/femininity	64%	Need to balance between masculinity and femininity.
		Environment protection not only limited to environment, but also our life.
		Expert agreed with the rest.
Long term relationship	45%	Experts acknowledged the components.
		Need to add category to standardize with other dimensions

Note: Percentage in quantitative data indicate the percentage of relevant and easy to understand.

In general component, results from quantitative data shows that 64% of experts agreed

that the components in cultural dimension are relevant and 82% of experts agreed that

the components if HCI Icon Principle are relevant. While for qualitative results, expert responded that there are many components, the scope needs to be focused and some components need explanations. Based on these results, the components need to be revised, especially the components in cultural dimensions as the quantitative result is quite low even though it passed the 60% scores as suggested by Clarke and Warwick (2001).

For the model's flow component, 91% experts agreed that the model's flow is logical. Meanwhile, the qualitative results showed that the experts suggested to add the process flow, mandatory and optional components, relationship between components. These suggestions arose as a result of the draft model's lack of a clear process flow. Actually, there are arrows, but the directions are vague and unspecific (see Figure 4.1).

Furthermore, experts stated that the round shape is confusing and that a better workflow is needed to provide a better understanding to the user. This comment implied that the round shape model did not clearly show the model's workflow. When using the model, this can leave the user perplexed as to where to begin. So, a better shape of model needs to be revised and provide a better workflow along with the mandatory and optional components.

Experts also suggested to standardize the subcategory of the cultural dimension. This is because, the subcategories of the current cultural model are not similar. An amendment is needed to ensure the standardization of the subcategory.

For the power distance components, 82% of expert agreed that the components are easy to understand. This showed that most of the experts can easily understand what the cultural element in the power distance dimension are. For the qualitative data, expert suggested to include modern and traditional type of Culturicon for the political and work category. This is because, when it relates with culture, the element of modern and traditional are equally important. By providing both types, designers can explore a broader cultural perspective that is not limited to modern or traditional only.

For collectivism component, 55% experts agreed that the components are easy to understand. This result is slightly below that suggested score. Amendments are need for this component. While for qualitative data, expert agreed with the trait of national outfits and culinary, traditional games and agriculture.

Expert also suggested to add the trait of custom and rule under the social norm category. This is because, the culture is Asian countries are well-known of its custom and rule. So, it needs to be added in this cultural dimension. For criteria, hiring and promotion take in group status need to be considered as expert said that it is not relevant with the Asian countries.

For uncertainty avoidance component, 55% experts agreed that the component is easy to understand. Same with previous component, this component also scored slightly below suggested score. In terms of qualitative data, an expert agreed with this cultural dimension, stating that Malaysians have assimilated Western culture without losing Malaysian culture. This demonstrated that Malaysians are adaptable to cultural changes. For instance, the manner in which one dresses and eats. Malaysians can

174

accept Westerners' dressing and eating habits while still maintaining Malaysian dressing and eating habits.

Experts also agreed on religion and having fewer gender roles. This is due to the fact that Malaysia is comprised of multiple races and religions that can coexist. This demonstrates that each religion can accept the other. Experts also stated that there is no specific gender role for the fewer gender roles. A man can do anything a woman can do, and vice versa. However, expert suggested to change the citizen protest are accepted trait to government changes are accepted. This is due to the need for culture to demonstrate a positive outlook. Negative viewpoints must be avoided at all costs.

For the masculinity/femininity component, 64% expert agreed that the component is easy to understand. Expert stated that the trait of this cultural dimensions needs to be balanced between masculinity and femininity. This is because the level of this cultural dimension for Asian countries is moderate. For the girl emphasis on environment protection trait, expert emphasized that the trait not only limited to environment protection, but also to the protection of the family's lives.

For the long-term relationship components, 45% experts agreed that the component is easy to understand. While for the qualitative data, experts acknowledge the traits provided in this dimension. To standardize it, expert suggested to add the subcategory as the other dimensions. Because the current long-term relationship dimension does not have any subcategory, only traits were provided. So, a subcategory that are appropriate with the traits need to be added.

175

All of the components, whether major or minor, require amendments based on the results of the quantitative and qualitative data. The revisions were done in accordance with the experts' recommendations. The revised version of the CDM, as well as the changes made to improve the model, were discussed in the following section.

4.5   Revised Version of CDM

The model was then modified accordingly according to the comments and suggestions provided by the experts. Every component of the model was checked again to ensure that it aligns with the expert feedback. Following that, a revised version of CDM was developed. Figure 4.6 illustrates the revised version of CDM.

Referring to the suggestions provided by E1, E7 and E8, the circular model was modified to a flow-shaped model to demonstrate its process flow for easier understanding of how the model works. Through the incorporation of a process flow, users can identify where to start and what the next steps are.

The process flow starts with identifying the cultural trait, where users may choose one or many cultural traits from the provided cultural dimensions. At least one cultural trait must be selected in this first phase. The next phase involves designing the Culturicon. For this phase, users must fulfil all eight HCI icon design principles (after the modification of the model). The subsequent phase involves developing the Culturicon based on the selected cultural trait and all HCI icon design principles.

CULTURAL DIMENSIONS

- ❖ High Power Distance
- ❖ High Collectivism
- ❖ Low Uncertainty Avoidance
- ❖ Moderate Masculinity/Femininity
- ❖ Long-Term Relationship

by selecting one

1 **IDENTIFY CULTURAL ELEMENTS**

2 **DESIGN OF THE CULTURICON**

by fulfilling all

HCI ICON DESIGN PRINCIPLES

- ❖ Familiar
- ❖ Understandable
- ❖ Attractive
- ❖ Coherent
- ❖ Informative
- ❖ Distinct
- ❖ Memorable
- ❖ Legible

3 **DEVELOP THE CULTURICON**

Figure 4.6. Revised Version of the Culturicon Design Model

177

Another modification made for the model in this study was the omission of HCI icon design principles. The principles of unambiguous, extensible, and compact were omitted from the model due to several reasons. Firstly, the principles of unambiguous and distinct share similar meaning. As suggested by E1, the principle of unambiguous was omitted from the model.

Meanwhile, the principles of extensible and informative possess similar meaning. There is a specific criterion for the latter principle: the design belongs to a category. Therefore, an extended version of the design also belongs to a category that is extended from the main concept. In other words, the principle of extensible was deemed unnecessary for the model.

Furthermore, the principle of extensible is related to the principle of legible—both principles share the same criteria. Thus, this principle was omitted. As for the principle of compact, it was omitted from the model because the principle was deemed not critical in the design of the Culturicon.

Table 4.11 and Table 4.12 present the detailed version of CDM, which includes cultural dimensions and HCI icon design principles as well as the corresponding trait and criteria. Table 4.11 describes the cultural dimensions (the first phase) whereas Table 4.12 describes the HCI icon design principles (the second phase).

Table 4.11

Phase 1: Cultural Dimensions of Culturicon Design Model

Phase 1: Identify Cultural Element		
Cultural Dimension	Category	Trait
High Power Distance	National	National building, ruler building, and historical building
	Social Norm	Privilege of authority and those in power
	Political	Power of royal institution and military (traditional/modern)
	Religion	Religion buildings and holy places
	Work	Government and organisational hierarchy (traditional/modern)
	Education	School hierarchy
	Family	Young people respect elderly.
High Collectivism	National	Traditional games and agriculture
		National outfit and culinary
	Social Norm	Obedient to customs and rules
		Value interpersonal harmony
	Political	Law depends on the ruler or group.
	Religion	Celebrations and ceremonies
	Work	Work in group and support each other
		Maintain harmonious environment
	Education	Learning in group
		Students respect teachers.
	Family	Extended family and tribe
Low Uncertainty Avoidance	Social Norm	Open to changes and innovation
		Tolerance for diversity
	Political	High interest in politics
		Government changes are accepted.
	Religion	Many religions
		Each religion respects one another.
	Work	Less loyalty
		At ease with changing jobs
	Education	Open-ended learning
	Family	Fewer gender roles

Table 4.11 continued

Moderate Masculinity/ Femininity	Social Norm	M: Emphasis on money and things
		F: Emphasis on quality of life and people
		M: High priority for economic growth
		F: High priority for environmental protection
		M: Ego-oriented
		F: Relationship-oriented
	Political	M: Solve conflict using force
		F: Solve conflict through negotiation
	Work	M: Prefer high pay
		F: Prefer shorter working hours
		M: Prefer fewer women in management
		F: Prefer more women in management
	Education	M: Failing is seen as disaster.
		F: Failing is seen as minor accident.
	Family	M: Girls can cry; boys cannot cry.
		F: Boys and girls can cry.
		M: Boys can fight; girls cannot fight.
		F: Boys and girls cannot fight.
Long-Term Relationship	Social Norm	Personal adaptability is important.
		Relationships are ordered by status.
	Work	Emphasis on persistence
		Less emphasis on leisure time
	Family	Be thrifty

Table 4.12

Phase 2: HCI Icon Design Principles of the Culturicon Design Model

Phase 2: Design of The Culturicon	
HCI Icon Design Principles	**Criteria**
Familiar	Users are familiar with the design.
	Design is common in the users' environment.
	Applicable from real-world knowledge
Understandable	Spontaneously suggest the intended concept
	Strong association between the Culturicon and its concept
	Meaning is based from direct association.
Attractive	Visually balanced and stable
	Proportioned to fit the available space

Table 4.12 continued

	Use harmonious colours, patterns, and values
Coherent	It is clear where one icon ends and another begins
	Focus and hold attention on the subject matter of the icon
	Secondary design elements are clearly subdued in relative to the primary subject matter.
Informative	Design concept is important.
	Design does belong to the category.
	Users are able to interact by using it in CMC.
	Assist users in expressing their intention
Distinct	Design is different from other designs to avoid confusion.
	Every design is distinct from other designs.
	Distinguishing characteristics are clear among the set of alternatives.
Memorable	Clearly identified by users
	Striking and vivid
	Placed in the scheme of interface is clear
Legible	Design is legible at reading distances.
	Sufficient foreground-background contrast

For the first phase, the modifications of categories and traits were made based on the suggestion by the culture expert (E5). As this model was adapted from the Hofstede culture model, it may not be specifically appropriate for the culture of certain Asian countries. This study used expert opinions to modify the model in order to meet the cultural perspectives of certain Asian countries, especially Malaysia. All modifications made to the revised version of CDM for all cultural dimensions are tabulated from Table 4.13 to Table 4.18.

Table 4.13

Modifications for High Power Distance

Category	Previous Trait	Amendment
Political	Expressed "power of government and military"	Revision: Power of royal institution and military (traditional/modern)
Work	Expressed "organisational hierarchy"	Revision: Government and organisational hierarchy (traditional/modern)
	Expressed that each role has its place	
School	Expressed "school hierarchy"	Change the category from "school" to "education"
	Expressed "teachers and parents are in command for teaching"	Revision: School hierarchy
Family	None	Add new category: Family Trait: Young people respect elderly.

Table 4.13 shows the modifications made for the High Power Distance dimensions. The modifications made were for the traits in category of political, work, school, and family. The modification in political category is the change from the trait 'power of government and military' to 'power of royal institution and military'. Besides that, the new trait can be design in two type which are the traditional and modern.

For the work category, the modification made is the change of trait from 'organisational hierarchy' and 'expressed each role has its place' to 'government and organisational hierarchy'. This trait also can be designed for traditional type and modern type. The trait government which is in the political category previously was moved to work category because government is the group of people with authority to

182

govern and serve the citizen. The work category is more suitable compared to political category.

For the school category, the modifications made are the category itself which is from 'school' to 'education'. This is because in order to standardise the learning process with other dimensions, the education term is more suitable. The process of knowledge transfer is not limited to school only. The term education can cover wider aspect of knowledge transfer. Besides that, the trait 'teachers and parents are in command for teaching' was removed based on expert's comment. Other modification made for power distance dimension is the addition of family category where there is trait of 'young people respect elderly'.

Table 4.14

Modification for High Collectivism

Category	Previous Trait	Amendment
National	Expressed "traditional games and agriculture", "extended family and tribe", and "national outfit and culinary:	Omit "extended family and tribe"
Social Norm	None	Add social norm category Add the trait: "Obedient to customs and rules" and "value interpersonal harmony"
Religion	Expressed "polytheistic religion"	Omit "polytheistic religion"
Work	Expressed "shorter working hours" and "hiring and promotion take in group status"	Omitted the trait of "shorter working hours" and "hiring and promotion take in group status" Add the trait of "work in group and support each other" and "maintain harmonious environment"

Table 4.14 continued

School	None	Change the category from "school" to "education"
Family	None	Add new category: Family. Add trait: Extended family and tribe

Table 4.14 shows the modifications made to the High Collectivism dimensions. For the national category, the trait 'extended family and tribe' was moved to the newly created family category. Then, the category of social norm was created so that the trait 'obedient to customs and rules' and 'value interpersonal harmony' can be added in this category. These traits were suggested by the expert. Besides that, the trait 'polytheistic religion' was also omitted from the religion category.

For the work category, the trait 'shorter working hour' and 'promotion take in group status' were omitted and were replace with 'work in group and support each other' and 'maintain harmonious environment'.

Table 4.15

Modification for Low Uncertainty Avoidance

Category	Previous Trait	Amendment
Political	Expressed "high interest in politics", "citizen protests are accepted", and "fewer and general laws and regulations"	Omit "citizen protests are accepted" and "fewer and general laws and regulations" Add trait: Government changes are accepted.
Religion	Expressed "many religions", "little persecution for belief", and "each religion respects one another"	Omit "little persecution for belief"
School	Expressed "open-ended learning"	Change the category from "school" to "education"

Table 4.15 shows the modifications for Low Uncertainty Avoidance dimension. In political category, the trait 'high interest in politics', 'citizen protests are accepted' and 'fewer and general laws and regulations' were omitted. The new trait is added to this category, which is 'government changes are accepted'.

For the religion category, the trait 'little persecution for belief' was omitted. The traits for religion are 'many religions' and 'each religion respects one another'. Then, the school category was changed into education category.

Table 4.16

Modification for Moderate Masculinity/Femininity

Category	Previous Trait	Amendment
Political and Economic	None	Omit the economic category and put its trait under "social norm" category
School	None	Change the category from "school" to "education"

Table 4.16 shows the modifications made to Moderate Masculinity/Femininity dimensions. The modifications made is for the political and economic category, where the economic category was omitted, and its trait was transferred into social norm category. Then, the school category was changed to education category.

Table 4.17

Modification for Long-Term Relationship

Category	Previous Trait	Amendment
Social Norm	Expressed "personal adaptability is important" and "relationships are ordered by status"	Add social norm category and put the previous trait under this category

Table 4.17 continued		
Work	Expressed "emphasis on persistence" and "leisure time not too important"	Add work category and put the previous trait under this category
Family	None	Add family category and add the trait "be thrifty"

Table 4.17 shows the modifications made for Long-Term Relationship dimension. Previously, there is no category for this dimension. As experts suggested to add the category so that the category can be standardise, the category of social norm, work and family were added. For social norm category, the trait 'personal adaptability is important' and 'relationships are ordered by status' were added. Then, the trait 'emphasis on persistence' and 'less emphasis on leisure time' were added in work category. For the family category, the trait 'be thrifty' was added.

Focusing on the second phase, the necessary modifications were made to the revised version of CDM for the HCI icon design. Table 4.18 presents the modifications made.

Table 4.18

Modification for HCI Icon Design Principles

Principle	Amendment
Unambiguous	Omitted; its criteria are similar with the criteria of the distinct principle.
Extensible	Omitted; its meaning and criteria are similar with that of the informative and legible principles.
Compact	Omitted; it was deemed not critical for the design of the Culturicon.

Table 4.18 shows the modification for HCI Icon Design Principles. The modifications made are for the principle of unambiguous, extensible, and compact. These principles were omitted based on the suggestions by experts. The unambiguous principle was omitted because its criteria are similar with the criteria of the distinct principle. The

186

same reason for the omission of extensible principle as its meaning and criteria are similar with the informative and legible principles. Lastly, the compact principle was omitted because it was deemed not critical in designing Culturicon.

4.6 Chapter Summary

The design and development of CDM were discussed in this chapter including the justifications for the selected cultural dimensions and HCI icon design principles for the CDM design. Meanwhile, for the development of CDM, this chapter discussed the key components of the CDM, which included the cultural dimensions, categories, and traits (Phase 1) as well as the HCI icon design principles and criteria (Phase 2). A total of 11 experts were selected to verify the proposed CDM.

The convergent parallel mixed method approach was conducted for the verification method where there are data from both quantitative and qualitative results. Quantitative results show that two cultural dimensions and 10 HCI icon design principles score more than 60%, while three cultural dimensions and 1 HCI icon design principles score slightly less than 60%.

According to the qualitative findings, changes to the components of cultural dimensions and HCI Icon principles are required. Enhancements to the model's process flow are also required, including the addition of specific workflows, optional and mandatory components, and relationships between components.

Following that, a revised version of the CDM was developed according to the expert feedback. The modifications of the revised model were also discussed in this chapter.

The interface of the model has been changed from a circular-shaped into a flow-shaped model. By these flow-shaped model, it is easier for user to understand the flow of the model. Other modifications made were the omission of principles *unambiguous*, *extensible*, and *compact* due to several reasons and feedback from the experts.

The revised model was then validated by the designer. Next section discusses on the validation process of CDM by designer.

CHAPTER FIVE

VALIDATION OF THE CULTURICON DESIGN MODEL

5.0 Introduction

After the development and verification of the proposed CDM, this study proceeded to
validate the model in two phases, which involved model validation by designers and
model validation by end users. Designers were selected to validate the model because
they are the target users after all. The proposed model potentially serves as a guideline
for designers to develop the Culturicon.

Following that, end users of mobile messaging application were selected to validate
the developed Culturicon in this study, specifically on whether the Culturicon can be
understood by users and helpful in their conversations via CMC. In doing so, the
explanatory sequential mixed method design was applied. This chapter discusses the
model validation by designers.

5.1 Model Validation by Designer

As mentioned in introduction, validation by designer applied the explanatory
sequential mixed method design. Explanatory sequential mixed method design is a
method where the researcher first conducts quantitative research, analyses the results,
and then builds on the findings with qualitative research to explain them in greater
detail (Creswell, 2014). It is regarded as explanatory because the initial quantitative
data results are explained further using qualitative data. Because the initial quantitative
phase is followed by the qualitative phase, it is considered sequential. Figure 5.1

189

depicts the process of explanatory sequential mixed method design, with the process in green indicating the validation by designer process.
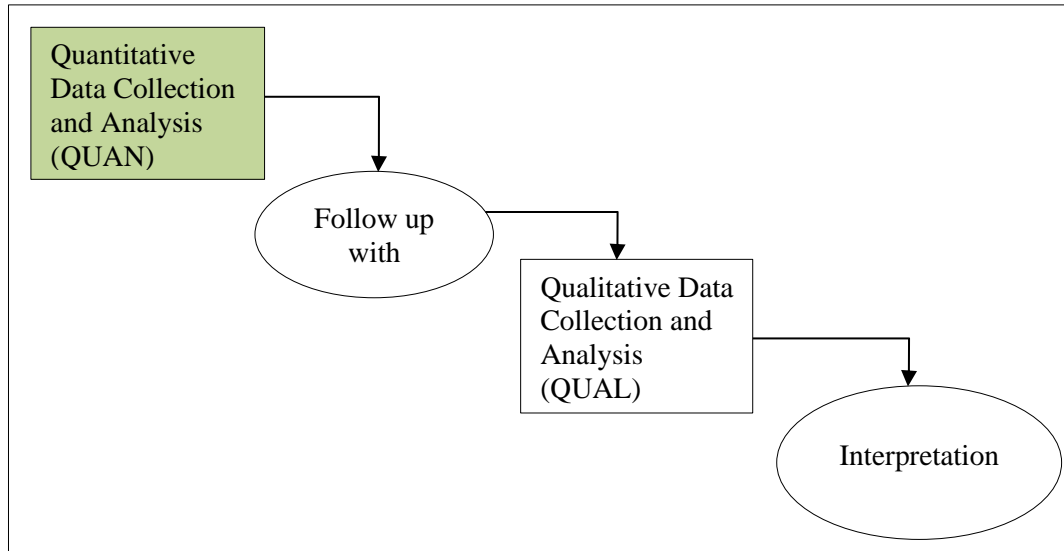
Figure 5.1. Explanatory Sequential Mixed Method (QUAN)

This method was chosen because the designer, which is the primary user of the model, used the model to develop sample of Culturicon. Then, based on their experience in developing the sample Culturicon, they validated the model through a questionnaire. The results of the questionnaire were the quantitative data.

Then, a validation by end user was conducted where these end users used the sample of Culturicon in CMC. Based on their experience in using the sample Culturicon, a focus group discussion was conducted to gather their feedback. The result of focus group discussion were the qualitative data. This means that the quantitative data were gathered and analysed first, followed by the qualitative data.

As discussed in Section 3.6.1, a letter of nomination was sent to every designer via e-mail to brief these experts about the current study and ask for their approval to

190

participate in this study. These designers were required to use the verified CDM as a guideline to design the Culturicon. A total of 15 designers were contacted, but only five designers accepted and expressed willingness to participate in this study. These five designers were individually contacted, and appointments were made. A thorough explanation about the study and the CDM was provided. Once they confirmed their participation, a validation document was provided, which included the following: (1) introduction of the study; (2) profile of designers; (3) introduction of Culturicon Design Model; (4) Culturicon Design Model; (5) model validation form.

5.2 Result of Model Validation by Designer

For the first model validation process, three designers from the industry and two freelance designers participated. They have more than five years of experience in graphic design, which satisfied the requirement by Nielsen and Molich (1990). Table 5.1 presents the profile of these designers.

Table 5.1

Profile of Designer

Designer (D)	Academic Qualification	Organisation	Years of Experience
D1	Bachelor's degree	Modenas	7 years
D2	Bachelor's degree	Modenas	6 years
D3	Diploma	NDesign Outline	6 years
D4	Bachelor's degree	Freelance	5 years
D5	Bachelor's degree	Freelance	5 years

Using the developed CDM, these designers designed and developed the Culturicon.

Table 5.2 displays the developed samples of Culturicon by these designers.

Table 5.2

Sample of Culturicon by Designers

Designer	Cultural Dimension	Culturicon	Name
Designer 1	High Power Distance		Rumah Panjang
			Gunung Kinabalu
			Menara Kuala Lumpur
			Stadium Bukit Jalil
			Malaysia Airlines
			Terengganu
	High Collectivism		Durian
			Satay
Designer 2	High Power Distance		KLCC

Table 5.2 continued

			Litar Sepang
			Langkawi
	High Collectivism		Membajak
			Mencangkul
			Menjala
			Mesin Padi
			Sawah Padi
			Traktor
			Nasi Lemak
Designer 3	High Power Distance		Istana Anak Bukit
	High Collectivism		Gasing
			Hari Raya

Table 5.2 continued

Chinese New Year

Deepavali 1

Deepavali 2

Ketupat

Lemang

Solat

Solat Jemaah 1

Solat Jemaah 2

Solat Lelaki

Solat Wanita 1

Solat Wanita 2

Table 5.2 continued			
Designer 4	High Power Distance		Putrajaya
	High Collectivism		Congkak
			Masyarakat Majmuk
Designer 5	High Collectivism		Wau Bulan
			Baju Melayu 1
			Baju Melayu 2
			Baju Kurung
	Low Uncertainty Avoidance		Perbincangan
			Menghormati agama lain
	Moderate Masculinity/Femininity		Lelaki Mementingkan Ekonomi
			Wanita Mementingkan Keharmonian Rumahtangga

Table 5.2 continued

Long-Term Relationship		Menyesuaikan diri
		Perhubungan Mengikut Status

As presented in Table 5.2, the designers designed and developed a total of 45 samples of Culturicon. The dimensions of high power distance and high collectivism were found popular among these designers, where four of them applied high power distance dimension and all five of them applied high collectivism dimension. Only Designer 5 applied more than two dimensions—the designer applied dimensions of high collectivism, low uncertainty avoidance, moderate masculinity/femininity, and long-term relationship for the development of Culturicon.

After the development of Culturicon, the designers were required to complete the model validation form. The results of model validation by designers for cultural dimensions are presented in Table 5.3, while the results of model validation by designers for HCI icon design principles are presented in Table 5.4.

Table 5.3

Results of Model Validation by Designers for Cultural Dimensions

Cultural Dimensio	Category	Trait	D1	D2	D3	D4	D5	Percentage (%)
High Power Distance	National	National building, ruler building, and historical building	√	√	√	√	√	100
	Social Norm	Privilege of authority and those in power	√	√	√	√	√	100

196

Table 5.3 continued								
	Political	Power of royal institution and military (modern/traditional)	√	*	√	√	√	80
	Religion	Religion buildings and holy places	√	√	√	√	√	100
	Work	Government and organisational hierarchy (modern/traditional)	√	√	*	√	√	80
	Education	School hierarchy	√	*	√	√	√	80
	Family	Young people respect elderly.	√	*	√	√	√	80
High Collectivism	National	Traditional games and agriculture	√	√	√	√	√	100
		National outfit and culinary	√	√	√	√	√	100
	Social Norm	Obedient to customs and rules	√	√	√	√	√	100
		Value interpersonal harmony	√	√	*	√	√	80
	Political	Law depends on the ruler or group.	√	√	*	√	√	80
	Religion	Celebrations and ceremonies	√	*	√	√	√	80
	Work	Work in group and support each other	√	*	√	√	√	80
		Maintain harmonious environment	√	√	√	√	√	100
	Education	Learning in group	√	√	√	√	√	100
		Students respect teachers	√	√	√	√	√	100
	Family	Extended family and tribe	√	√	√	√	√	100
Low Uncertainty Avoidance	Social Norm	Open to changes and innovation	√	*	√	√	√	80
		Tolerance for diversity	√	√	√	√	√	100
	Political	High interest in politics	√	√	√	√	√	100
		Government changes are accepted.	√	*	√	√	√	80
	Religion	Many religions	√	√	√	√	√	100

197

Table 5.3 continued									
		Each religion respects one another	√	√	√	√	√	100
	Work	Less loyalty	√	*	√	√	√	80
		At ease with changing jobs	√	√	*	√	√	80
	Education	Open-ended learning	√	*	√	√	√	80
	Family	Fewer gender roles	√	√	√	*	√	80
Moderate Masculinity/Femininity	Social Norm	M: Emphasis on money and things F: Emphasis on quality of life and people	√	*	*	√	*	40
		M: High priority for economic growth F: High priority for environmental protection	√	*	√	√	√	80
		M: Ego-oriented F: Relationship-oriented	√	√	*	√	√	80
	Political	M: Solve conflicts using force F: Solve conflicts through negotiation	√	*	√	√	√	80
	Work	M: Prefer high pay F: Prefer shorter working hours	√	√	√	√	√	100
		M: Prefer fewer women in management F: Prefer more women in management	√	√	√	√	√	100
	Education	M: Failing is seen as disaster. F: Failing is seen as minor accident.	*	*	*	√	*	20
	Family	M: Girls can cry; boys cannot cry F: Boys and girls can cry.	√	√	*	√	√	80
Long-Term	Social Norm	Personal adaptability is important	√	√	√	√	√	100

198

Table 5.3 continued							
	Relationships are ordered by status.	*	√	√	√	√	80
Work	Emphasis on persistence	√	√	√	√	√	100
	Less emphasis on leisure time	*	*	√	√	√	60
Family	Be thrifty	√	√	*	√	√	80

Notes: √ denotes agree; * denotes disagree.

As shown in Table 5.3, the following traits under the power distance dimension scored 100%: national building, ruler building, and historical building (national category); privilege of authority and those in power (social norm category); and religion buildings and holy places (religion category). The remaining traits scored 80%: the power of royal institution & military, government & organization hierarchy, school hierarchy and young people respect elderly.

For high collectivism dimension, the following traits scored 100%: traditional games and agriculture; national outfit and culinary; obedient to customs and rules; maintain harmonious environment; learning in group; students respect teachers; extended family and tribe. Other traits under the high collectivism dimension scored 80%: value interpersonal harmony; law depends on the ruler or group; celebrations and ceremonies; work in group and support each other.

For low uncertainty avoidance dimension, four traits scored 100%: tolerance for diversity; high interest in politics; many religions; each religion respects one another. The other six traits scored 80%: open to changes and innovation; government changes are accepted; less loyalty; at ease with changing jobs; open-ended learning; fewer gender roles.

For moderate masculinity/femininity dimension, two traits scored 100%: (1) M: Prefer high pay; F: Prefer shorter working hours; (2) M: Prefer fewer women in management; F: Prefer more women in management. Meanwhile, four other traits scored 80%: (1) M: High priority for economic growth; F: High priority for environmental protection; (2) M: Ego-oriented; F: Relationship-oriented; (3) M: Solve conflicts using force; F: Solve conflicts through negotiation; (4) M: Girls can cry; F: Boys and girls can cry. On the other hand, the remaining traits scored low (either 20% or 40%): (1) M: Emphasis on money and things; F: Emphasis on quality of life and people (40%); (2) M: Failing is seen as disaster; F: Failing is seen as minor accident (20%).

For long-term relationship dimension, two traits scored 100%: personal adaptability is important; emphasis on persistence. Meanwhile, the other two traits scored 80%: relationships are ordered by status; be thrifty. The remaining trait scored 60%: less emphasis on leisure time.

Clarke and Warwick (2001) suggested that if an item scores at least 60%, on average, the item can be considered due to the high possibility of yielding significant outcome. Based on the results of model validation by designers for cultural dimensions, all traits scored 60% and above, except for the following traits under the moderate masculinity/femininity dimension: (1) M: Emphasis on money and things; F: Emphasis on quality of life and people (40%); (2) M: Failing is seen as disaster; F: Failing is seen as minor accident (20%).

The result on the moderate level for masculinity/femininity dimension for Asian countries, including Malaysia, was obtained by Hofstede (2011). Hofstede suggested these traits based on the score of the cultural dimension, which is moderate

masculinity/femininity. However, not all Asian countries possess similar traits regarding this cultural dimension. There may be slightly different regarding this trait between Asian countries.

As shown in Table 5.4, the results of model validation by designers for HCI icon design principles revealed a total of eight principles and 23 criteria. Based on the recorded scores (all components scored 100%), it appeared that all designers agreed on the incorporation of these components in the model.

Table 5.4

Results of Model Validation by Designers for HCI Icon Design Principle

Principle	Criteria	D1	D2	D3	D4	D5	Percentage (%)
Familiar	Users are familiar with the design.	√	√	√	√	√	100
	Design is common in the users' environment.	√	√	√	√	√	100
	Applicable in real-world knowledge	√	√	√	√	√	100
Understandable	Spontaneously suggest the intended concept	√	√	√	√	√	100
	Strong association between the Culturicon and its concept	√	√	√	√	√	100
	Meaning is based from direct association.	√	√	√	√	√	100
Attractive	Visually balanced and stable	√	√	√	√	√	100
	Proportioned to fit the available space	√	√	√	√	√	100
	Use harmonious colours, patterns, and values	√	√	√	√	√	100

Table 5.4 continued							
Coherent	It is clear where one icon ends and another begins	√	√	√	√	√	100
	Focus and hold attention on the subject matter of the icon	√	√	√	√	√	100
	Secondary design elements are clearly subdued in relative to the primary subject matter.	√	√	√	√	√	100
Informative	Design concept is important.	√	√	√	√	√	100
	Design does belong to the category.	√	√	√	√	√	100
	Users are able to interact by using it in CMC.	√	√	√	√	√	100
	Assist users in expressing their intention	√	√	√	√	√	100
Distinct	Design is different from other designs to avoid confusion.	√	√	√	√	√	100
	Distinguishing characteristics are clear among the set of alternatives	√	√	√	√	√	100
Memorable	Clearly identified by users	√	√	√	√	√	100
	Striking and vivid	√	√	√	√	√	100
	Placed in the scheme of interface is clear	√	√	√	√	√	100
Legible	Design is legible at reading distances.	√	√	√	√	√	100
	Sufficient foreground-background contrast	√	√	√	√	√	100

Notes: √ denotes agree; * denotes disagree.

After the validation of all components of cultural dimensions and HCI icon design principles, the designers proceeded to validate the overall model. Table 5.5 presents the results of overall model validation.

Table 5.5

Results of Overall Model Validation by Designers

Criteria	Variable	D1	D2	D3	D4	D5	Percentage (%)
Gain satisfaction	Relevancy to the intended application	√	√	√	√	√	100
	Perceived usefulness	√	√	√	√	√	100
	Clarity	√	√	√	√	√	100
Interface Satisfaction	Ease of use	√	√	√	√	√	100
	Organisation	√	√	√	√	√	100
Task support satisfaction	Practicality	√	√	√	√	√	100
	Completeness	√	√	√	√	√	100
	Understandability	√	√	√	√	√	100
	Ability to produce expected result	√	√	√	√	√	100

Notes: √ denotes agree; * denotes disagree.

As shown in Table 5.5, the overall model was validated in terms of the following criteria: gain satisfaction; interface satisfaction; task support satisfaction. The pre-

203

defined criteria were adapted from previous studies (see Abubakar, Hashim, & Hussain, 2016; Al-tarawneh, 2014; Kunda, 2003).

The first criterion (gain satisfaction) consisted of three variables: relevance to the intended application; perceived usefulness; clarity. These variables reveal the accuracy of the model (Kunda, 2003). All variables scored 100%, which indicates the agreement of all designers on the relevance of the model for the intended application (mobile messaging application) as well as the usefulness and clarity of the model for designers to design and develop the Culturicon based on their experience of using the model to develop samples of Culturicon during the model validation process.

The second criterion (interface satisfaction) consisted of ease of use and organisation. These variables reflect the practicality of the model in the design and development of the Culturicon. All designers in this study agreed that it is easy to use the model although most of them initially noted the complexity of the model. Once they were briefed on how the model works, they managed to use the model with ease. All five designers also agreed that the overall model is well-structured and organised. In other words, the overall model is appropriate and easy for the designers to understand and use in the actual environment.

The final criterion (task support satisfaction) consisted of practicality, completeness, understandability, and ability to produce expected results. Firstly, practicality scored 100%, which shows the agreement of all designers on the practicality of the overall model for the design and development of Culturicon in the real-world environment.

Secondly, completeness also scored 100%, which shows the agreement of all designers on the adequacy and suitability of the overall model for the design and development of Culturicon that involves the culture element of Asian countries. The remaining variables of understandability and ability to produce expected results also scored 100%. This shows that the overall model is understandable and readable for the designers. Besides that, the overall model also shows its capability to identify the cultural element in the design and development of Culturicon for the intended users.

After the overall model validation process, designers were required to provide any comment and suggestion based on their experience of using the model. Table 5.6 displays the gathered comments and suggestions. All these comments and suggestions were taken into account. These expert feedbacks were deemed crucial for this study to improve the CDM from the viewpoints of designers or users of the model.

Table 5.6

Overall Comments and Suggestions from Designers

Designer	Comments/Suggestions
D1	This model is helpful especially when it comes to narrow down the scope of culture to be designed. However, culture dimension of long-term relationship is quite difficult to be designed in the form of Culturicon. Maybe can update the traits to make it easier to be interpreted by designer.
D2	In my opinion, this study is so inline and compatible with current need. This is because in this modern era, everything needs to be fast and easy to be understood. By having this Culturicon Design Model, I believe all the traits such as cultural dimension etc. will be easily understood globally. I am also hope that this study will be continue for further study that cover more aspect in the future.
D4	This model provides systematic flow/process for designer to design effective Culturicon by following all the dimensions and principles in the model. Using this model can help designer to create more Malaysian culture emoticon. For future work, this study can expand the dimension that also cover other regions.
D5	This model is quite interesting. Only that some term is a little bit hard to be understood. Maybe can use more user-friendly term.

5.3 Chapter Summary

The findings of model validation by designers were discussed in this chapter. The process began with the process of determining the designers to validate the CDM. Out of 15 designers contacted, five designers agreed to participate. The results were addressed after the model validation was completed, starting with the samples of Culturicon by designers.

A total of 45 samples of Culturicon were designed and developed by these designers. Following that, the findings of model validation for cultural dimensions and HCI icon design principles, as well as the findings of overall model validation, were discussed in this chapter. Results show that all traits scored 60% and above, except for the traits under the moderate masculinity/femininity dimension: (1) M: Emphasis on money and things; F: Emphasis on quality of life and people; and (2) M: Failing is seen as disaster; F: Failing is seen as minor accident.

Finally, the comments and suggestions by designers were also presented in this chapter. Four designers provided feedback, all of which were positive. They also made a suggestion on how to improve the model based on their perspective as a designer. Next chapter discusses another explanatory sequential mixed method design process which is qualitative data collection and analysis process.

CHAPTER SIX
FOCUS GROUP VALIDATION

6.0 Introduction

This chapter discusses the results of model validation by end users. Following the completion of model validation by designers, the study proceeded to the next phase: model validation by end users through focus group discussion. This model validation process was carried out to determine whether the samples of Culturicon developed by designers can be understood and useful to the end users in the real-world environment.

6.1 Focus Group Validation

In relation with the validation by the designer, the validation by end user possesses the qualitative data collection and analysis process. Figure 6.1 depicts the process of explanatory sequential mixed method design, with the process in green indicating the validation by end user process.
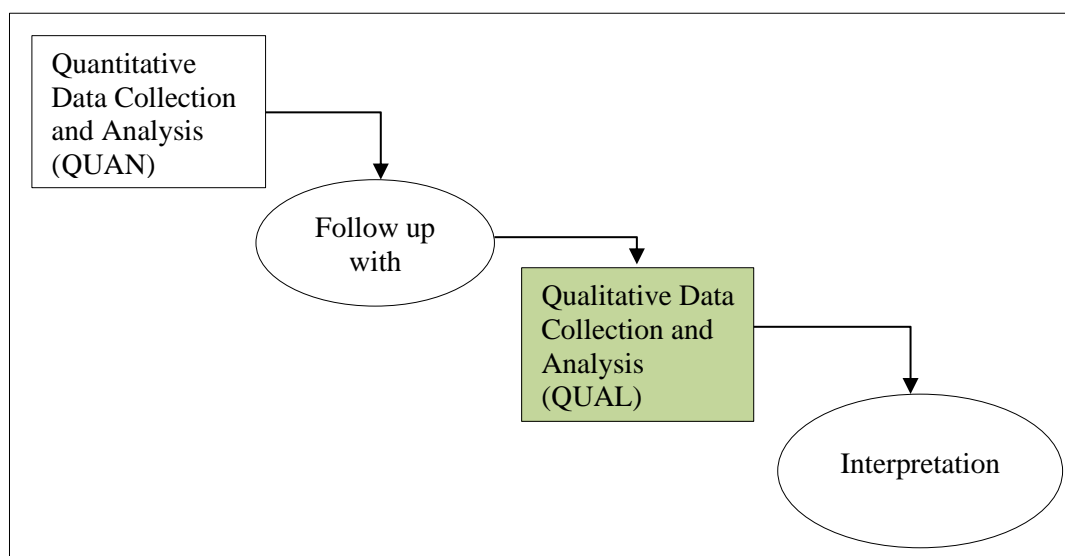
Figure 6.1. Explanatory sequential mixed method design (QUAL)

Following the quantitative data collection and analysis in validation by designer, the qualitative data collection and analysis in validation by end user was conducted. The intent of the qualitative data collection and analysis is to gather the end user feedback based on their experience in using the sample of Culturicon designed by the designer in the quantitative process.

In this study, focus group was used to validate the proposed model. Focus group is defined as a carefully planned series of discussion designed to obtain qualitative data and perceptions on a defined area of interest that focuses on a particular topic and issue in a permissive and non-threatening environment, involving six to seven participants (should not be less than three) (Krueger & Casey, 2000; Wilkinson, 2004; Cairns & Cox, 2008; Bryman, 2011). Krueger and Casey (2010) added that focus group is useful to gather information for summative evaluation and formative evaluation, particularly during the design phase of programmes, policies, and even evaluation.

Focus group is an efficient method to gain a large amount of information and specific opinions and ideas in a short time, and it is also an economical method to obtain data from multiple participants (Hines, 2000; Krueger & Casey, 2000). As compared to performing one-to-one interview separately, focus group enables the researcher to group and interview all participants simultaneously, which can speed up the data collection process (Lunt & Livingstone, 1996).

6.1.1 Planning

In this study, the planning for focus group validation involved four activities: (1) defining the objective of focus group; (2) identification of focus group participants;

(3) meeting scheduling; (4) material preparation for focus group discussion. The next subsections discuss the details of these activities.

6.1.1.1 Defining the Objective of Focus Group

The focus group discussion was conducted to address the fourth objective of this study: to validate the CDM through focus group discussion. With that, specific objectives were constructed:

1. To investigate whether users are able to understand the meaning of Culturicon

2. To validate whether the Culturicon is useful and helpful to users when they use it in CMC

3. To investigate whether the Culturicon is able to attract users, especially adults, to use technology

4. To investigate whether the Culturicon is able to assist users to understand and adapt to other culture

6.1.1.2 Identification of Focus Group Participants

The model was validated by a group of participants who were invited to use the developed samples of Culturicon (by designers) in CMC. These pioneering samples of Culturicon for CDM were designed and developed based on the Asian culture, specifically the Malaysian culture. This model is deemed applicable to other countries for future implementation.

The selected technique to identify the potential participants for focus group in this study was snowball sampling. The snowball sampling technique refers to identifying one or two individuals and then relying on these initial participants to identify other

individuals as participants (Naderifar, Goli, & Ghaljaie, 2017). This technique was selected because the members of the mobile messaging group in this study must know one another to ensure smooth and effective communication. The participants for this focus group were the teenagers. The recommended number of focus group participants range from six to eight individuals per group (Creswell, 2014), which was considered in this study.

Initially, a couple of teenagers were approached and asked if they wanted to take part in this study. After they agreed, they were encouraged to invite a friend to join them as participants in this study. Finally, a group of eight teenagers who knew one another agreed to participate in this focus group. They were all university students. This number fulfilled the numbers of focus group participants suggested by Creswell.

6.1.1.3 Meeting Scheduling

Prior to the initiation of focus group discussion, a meeting was scheduled with the participants to explain the process flow of model validation. They were informed of the two phases for this model validation: (1) use the samples of Culturicon in Telegram; (2) focus group meeting. The schedule for these two phases was discussed and arranged with all participants in this study.

6.1.1.4 Material Preparation for Focus Group

The material for the first phase of focus group discussion involved the samples of Culturicon that were designed and developed by designers. The participants were required to install Telegram application on their mobile phone. The samples of Culturicon were added to the Telegram Stickers for selection. In the second phase, the

material involved a validation document that consisted of the following: (1) brief introduction of the study; (2) profile of the participants; (3) objective of the focus group; (4) CDM description. This validation document was handed out to every participant during the focus group meeting for them to fill in their particulars and to refer throughout the discussion.

The questions for the focus group discussion were developed based on all HCI icon design principles: familiar, understandable, attractive, coherent, informative, distinct, memorable, and legible. These questions were then validated by three Computer Science experts. Based on their expert comments, amendments were made to the questions. As the focus group discussion was conducted in Bahasa Melayu, the questions were translated into Bahasa Melayu, which were validated by three experts in English.

6.1.2 Conducting Focus Group

The focus group discussion consisted of two phases. In the first phase, the participants were required to use the samples of Culturicon in the distributed collective interaction via CMC. The second phase involved the focus group meeting, where the participants were required to discuss their experience of using the samples of Culturicon in the first phase. The next subsections discuss the details of each phase.

6.1.2.1 Distributed Collective Interaction via Telegram

For this phase, Telegram application was used as the platform for the participants to perform CMC and distributed collective interaction. This was to test the samples of Culturicon in the real-world environment for the purpose of model validation. The

211

model validation process involved a total of eight teenagers. A Telegram group was created for these participants, and they were then added to it. The samples of Culturicon were added in the Telegram Stickers section for the participants to use them during the interaction session. Telegram enables users to add sticker pack to their sticker selection through @stickers bot. With this Telegram feature, this was deemed the best platform for this study to perform the model validation process for the samples of Culturicon.

A timeframe of one week was given to the participants to perform collective interaction in the assigned Telegram group. They were encouraged to use the samples of Culturicon during their collective interaction. After one week, all interactions within the group were ended. A meeting was scheduled for the group to discuss their experience of using the samples of Culturicon. Conversation screenshots of their interactions are presented in Figure 6.2. As shown in the figure, the participants did use the samples of Culturicon in their interactions.

Figure 6.2. Conversation Screenshot of the Telegram Group for Teenager

6.1.2.2 Focus Group Meeting

In this phase, the participants discussed their experience of using the samples of Culturicon. Their interactions during the focus group discussion were recorded using an audio recorder (mp3). A camcorder was used to keep track of any important issues discussed. Figure 6.3 show the focus group discussion for teenagers.

Figure 6.3. Focus Group Discussion for Teenagers

As shown in the figures, the moderator started the focus group discussion by asking a set of structured questions to the participants. These questions gave the participants a start-up and a way to prompt new ideas and opinions during the focus group discussion. The participants answered and discussed these questions based on their personal or collective experience. Their experience and recommendations were noted for future model revision.

6.2 Focus Group Findings (Phase 1): Distributed Collective Interaction

In the first phase, a Telegram group was created for teenagers' group. The participants were given a timeframe of one week to perform distributed collective interaction.

213

During this period, they were allowed to freely chat about any topic, and they were encouraged to use the samples of Culturicon that were uploaded in their Telegram Stickers selection. The frequencies of the usage of these samples of Culturicon in teenagers' groups are tabulated in Table 6.1.

Table 6.1

Frequencies of the Usage of Samples of Culturicon

Num.	Culturicon	Fre (T)	Num.	Culturicon	Fre (T)
1		7	24		0
2		1	25		2
3		1	26		1
4		2	27		0
5		0	28		15
6		1	29		4
7		0	30		3
8		1	31		1
9		3	32		2

Table 6.1 continued					
10		10	33		2
11		4	34		3
12		4	35		2
13		2	36		0
14		2	37		2
15		0	38		1
16		1	39		4
17		1	40		2
18		2	41		0
19		3	42		2
20		0	43		1
21		1	44		4

Table 6.1 continued					
22		4	45		2
23		2			

Notes: Fre (T) denotes Frequency for Teenager

For this study, the participating designers designed and developed a total of 45 samples of Culturicon using the proposed model, which were then uploaded to the Telegram Sticker selection for users. As shown in Table 6.1, *Nasi Lemak* (No. 28) recorded the highest frequency (*f*) of Culturicon usage among teenagers (*f* = 15). Following that, *Terengganu* (No. 10) recorded the second-highest frequency of Culturicon usage (*f* = 10), and *Malaysia Airlines* (No. 1) recorded the third-highest frequency of Culturicon usage (*f* = 7).

On the other hand, the following samples recorded similar frequency of usage (*f* = 4) among teenagers: *Langkawi* (No. 11); *Membajak* (No. 12); *Baju Melayu* 1 (No. 22); *Satay* (No. 29); *Solat Lelaki* (No. 39), *Menyesuaikan Diri* (No. 44). Next, there were four other samples that recorded similar frequency of usage (*f* = 3) among teenagers: *Stadium Bukit Jalil* (No. 9); *Chinese New Year* (No. 19); *Congkak* (30); *Perbincangan* (No. 34).

Meanwhile, a total of 13 samples similarly recorded frequency of 2: *Menara Kuala Lumpur* (No. 4); *Mencangkul* (No. 13); *Menjala* (No. 14); *Hari Raya* (No. 18); *Baju Kurung* (No. 23); *Durian* (No. 25); *Wau Bulan* (32); *Masyarakat Majmuk* (No. 33);

216

Menghormati Agama Lain (No. 35); *Solat Jemaah 1* (No. 37); *Solat Wanita 1* (No. 40); *Lelaki Mementingkan Ekonomi* (No. 42); *Perhubungan Mengikut Status* (No. 45).

Besides that, 11 other samples similarly recorded frequency of 1: *Gunung Kinabalu* (No. 2); *Istana Anak Bukit* (No. 3); *Litar Sepang* (No. 6); *Rumah Panjang* (No. 8); *Sawah Padi* (No. 16); *Membajak* (No. 17); *Deepavali 2* (No. 21); *Ketupat* (No. 26); *Gasing* (No. 31); *Solat Jemaah 2* (No. 38); *Perempuan Mementingkan Keharmonian Rumah Tangga* (No. 43).

Unsurprisingly, there were eight samples that recorded zero frequency of usage because most of these samples possess similar meaning with other samples of Culturicon. This occurred as a result of using the same cultural components to design these samples by the designers. The discussed samples with zero frequency were *KLCC* (No. 5), *Putrajaya* (No. 7), *Mesin Padi* (No. 15), *Deepavali 1* (No. 20), *Baju Melayu 2* (No. 24), *Lemang* (No. 27), *Solat* (No. 36), and *Solat Wanita 2* (No. 41). Overall, the total frequency of Culturicon usage among teenagers recorded 105.

Furthermore, based on the Culturicon usage in these group conversations, teenagers appeared to be generally more imaginative in their Culturicon usage. For example, teenagers used *Malaysia Airlines* to express that they are moving to another place although they are not actually taking the plane.

In another example, teenagers used *Terengganu* to express that a particular action is slow due to the design of a turtle (a symbolic icon for the Terengganu state). This mean that these teenagers did not use the Culturicon just merely by its original

217

meaning. They are capable to diversify its usage in their communication to enhance the meaning of their message.

6.3 Focus Group Finding (Phase 2): Focus Group Discussion

In the second phase, focus group discussion was performed. Seven teenagers (out of eight teenagers) agreed to attend the scheduled focus group discussion. An audio recorder and a camcorder were used to record the focus group discussion for both groups. The camcorder was used to complement the use of audio recorder to recognise who was talking during the discussion. Following that, the recorded discussion for both groups were then transcribed for analysis purpose. Thematic analysis was applied as the method of analysis for this study.

The tool used to perform thematic analysis was ATLAS.ti (version 9). ATLAS.ti is a versatile workbench for qualitative research involving textual, graphical, audio, and video data. It is a sophisticated instrument to assist the researcher in imaginative but structured ways to organise, reassemble, and manage data. As for the analysis of focus group discussion in this study, the documents (transcripts) for analysis involved textual data.

With respect to the objectives of focus group discussion, the questions for the focus group discussion were developed based on all eight HCI icon design principles. Therefore, these principles were used as themes for analysis purpose. Once the themes were established, deductive coding approach was performed.

Deductive coding approach is a method of analysis that starts with the process of establishing themes, followed by the processes of determining the codes and

identifying data segments to be quoted. Table 6.2 presents the report analysis of focus

group discussion in terms of focus group objectives, interview questions, themes, and

codes.

Table 6.2

Report Analysis of Focus Group Discussion

Focus Group Objective	Interview Question	Theme	Code
To investigate whether users are able to understand the meaning of Culturicon	1) Based on your experience of using Culturicon, can you recognise the meaning of Culturicon?	Understandable	Und-Meaning
	2) Are you familiar with the Culturicon?	Familiar	Fml-Familiar
	3) Can you see and recognise the Culturicon at reading distances?	Legible	Leg-Recognise
	4) Can you clearly remember and identify the Culturicon after using it for the first time?	Memorable	Mem-Remember
	5) Is the sorting of Culturicon clear?	Coherent	Coh-Sort
	6) Is the Culturicon design different from other designs?	Distinct	Dis-Differ
	7) Should there be any additional cues for the Culturicon?	Distinct	Dis-Cue
	8) Any suggestion on how to express more about our culture in the form of emoticon?	Informative	Inf-Suggestion
To validate whether the Culturicon is useful and helpful to users when	1) Do you think that having Culturicon in mobile messaging application makes technology feels closer and useful to you?	Familiar	Fml-Closer

Table 6.2 continued				
they use it in CMC	2)	Do you think Culturicon is helpful for you to express the cultural element in mobile messaging application?	Informative	Inf-Helpful
	3)	Do you think Culturicon is important in mobile messaging application to express Malaysia's culture?	Informative	Inf-Important
	4)	What social impact does the Culturicon have in these group messages?	Informative	Inf-Impact
To investigate whether the Culturicon is able to attract users, especially adults, to use technology	1)	Do you think the design and colour of the Culturicon are attractive enough to tempt you to use it?	Attractive	Att-Design
	2)	Do you think that having Culturicon in mobile messaging application can help to attract more users to use technology, especially among adults, where the culture is being represented digitally?	Attractive	Att-Attract
To investigate whether the Culturicon is able to assist users to understand and adapt to other culture	1)	Does the Culturicon reflect the culture in Malaysia?	Informative	Inf-Reflect
	2)	Do you think the Culturicon would assist users to have a better understanding of the Malaysian culture, especially for users of other culture?	Understandable	Und-Understanding
	3)	Do you think the Culturicon would help users to adapt to other culture?	Understandable	Und-Adapt

As shown in Table 6.2, a total of 17 interview questions were constructed to meet the

focus group objectives. Based on these questions, codes were defined for each

question for the thematic analysis using ATLAS.ti. The following subsections discuss

the obtained findings of the analysis based on these codes. (Larger figures of code network are provided in the appendix section for a clearer view)

6.3.1 Findings on Familiar Principle

The first principle of the CDM is familiar. Two questions were constructed with respect to the first and second focus group objectives:

1) *Are you familiar with the Culturicon?*

2) *Do you think that having Culturicon in mobile messaging application makes technology feels closer and useful to you?*

As illustrated in Figure 6.4, two codes were defined: Fml-Familiar and Fml-Closer. The correlation between these two codes was deemed interesting—Fml-Familiar was identified as the cause of Fml-Closer in this study. When users become familiar with the Culturicon, they would feel closer to the technology. By having the Culturicon in mobile messaging application, users can relate to the culture in the form of CMC because the Culturicon represents daily activities related to culture. The next subsections further discuss these codes.
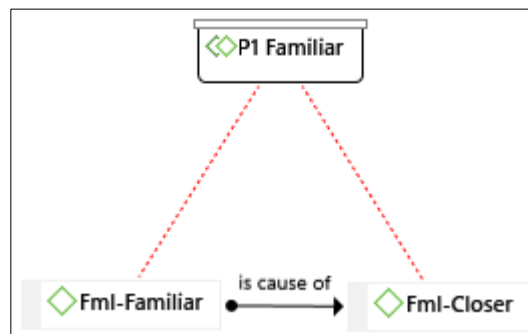
Figure 6.4. Analysis of Familiar Principle

221

6.3.1.1 Fml-Familiar

The Fml-Familiar code reflects the question of "*Are you familiar with the Culturicon?*". Figure 6.5 presents the analysis of Fml-Familiar code that was developed in the form of network. The figure includes quotations from the transcripts of both groups of participants in this study, with seven participants from group of teenagers (Participant 1, Participant 2, Participant 3, Participant 4, Participant 5, Participant 6, and Participant 7). The presentation of data in the form of network shows the relationships of these quotations, which makes it easier for comparison.

The *associated* relationship means that the response is similar with the other responses. The *justifies* relationship means that the response justifies or strengthens the other response, while the *contradicts* relationship means that the response is not in line with the other response.
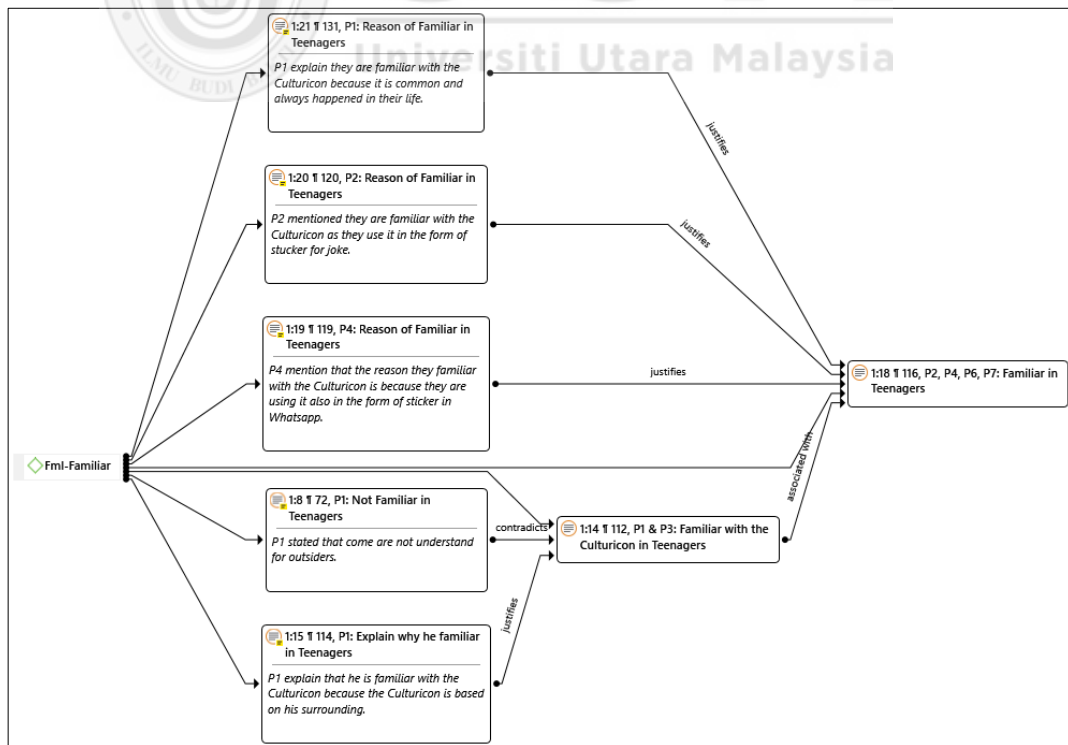
Figure 6.5. Fml-Familiar Code Network

As for Fml-Familiar code, the participants demonstrated their familiarity with the samples of Culturicon. The participants mentioned the following:

"*Familiar sebab benda yang selalu berlaku*", "*Familiar sebab Culturicon tu apa yang kita nampak dekat sekeliling*". **Participant 1**

"*Sebab selalu guna stickers*". **Participant 4**

Participant 1 stated that the Culturicon are familiar to them because they are things that always happen and can be seen in their surrounding environment. While participant 4 stated that he is familiar with the Culturicon because he always used the stickers. These responses demonstrated the participants' familiarity with the Culturicon because they found it relatable to their life and things that happen around them. All these responses reflect the *justifies* relationships in the network.

Only Participant 1 from the group of teenagers argued the possibility that certain users may not be familiar with some of the samples of Culturicon:

"*Cuma ada beberapa Culturicon mungkin tak berapa familiar bagi orang luar seperti Istana Anak Bukit*". **Participant 1**

However, Participant 1 emphasised that this involved only a few samples of Culturicons, as most of the samples were found common. As depicted in Figure 6.6, this response reflects the *contradict*s relationship.

Table 6.1 reveals the relationship between the frequencies of Culturicon usage and the feedback from participants. The participants used almost every sample of Culturicon,

223

especially the samples of Culturicon that are related to the culture of Kedah state, as the majority of the participants were from Kedah. This further reaffirmed their familiarity with the Culturicon based on their usage in this study.

6.3.1.2 Fml-Closer

The Fml-Closer code reflects the question of "*Do you think that having Culturicon in mobile messaging application makes technology feels closer and useful to you?*". Figure 6.6 shows the analysis of Fml-Closer code based on the transcript.
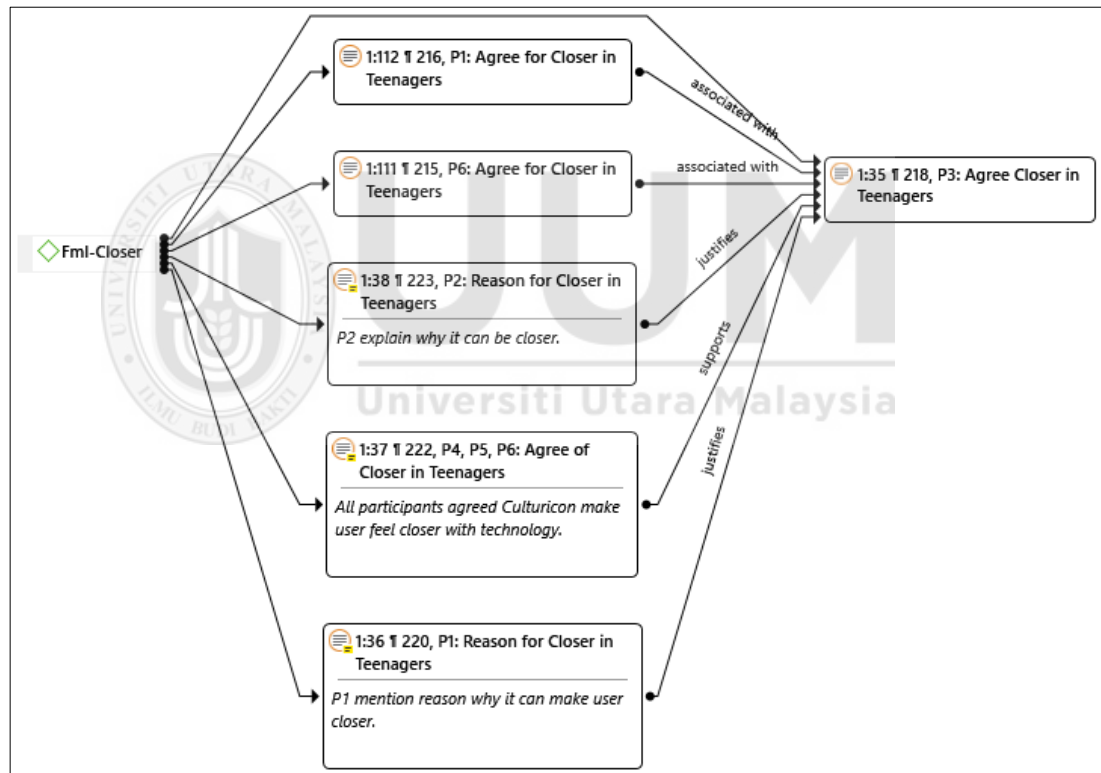
Figure 6.6. Fml-Closer Code Network

As shown in Figure 6.6, almost all participants agreed that having Culturicon in mobile messaging application makes technology feels closer and useful to them. Some of the responses for Fml-Closer are as follow:

"*Kita pakai Culturicon Malaysia ni untuk kita bercakap Bahasa Melayu, pasal harian-harian kita lah. Dekat Telegram bagi saya itu akan jadi more effective*". **Participant 2**

"*Sebab tu budaya kita. So, kita rasa benda tu ada pada sekeliling kita kan. So, rasa macam tak kekoklah nak guna*". **Participant 1**

Participant 2 responded by saying that user use Malaysian Culturicon to interact in Bahasa Melayu and daily activities. She agreed that using Culturicon can make the communication more effective. Meanwhile, participant 1 stated that the Culturicon are about Malaysian culture, which exist in their surroundings. This makes them to beel comfortable to use in their communication. These responses reflect *supports* and *justifies* relationships in the network, while the quotations that denote similar views reflect *associates with* relationship.

These responses demonstrated that the Culturicon addresses what happens in their everyday life and in their environment. The Culturicon allowed the participants in this study to feel closer to technology and its usefulness because they were able to apply it in CMC. Overall, the participants' responses for Fml-Familiar and Fml-Closer codes in this study fulfilled the criteria of familiar principle.

6.3.2 Finding on Understandable Principle

The second principle of the CDM is *understandable*. The following three questions were constructed:

1) *Based on your experience of using Culturicon, can you recognise the meaning of Culturicon?*

225

2) *Do you think the Culturicon would assist users to have a better understanding of the Malaysian culture, especially for users of other culture?*

3) *Do you think the Culturicon would help users to adapt to other culture?*

In order to address these questions, three codes were defined: Und-Meaning; Und-Understanding; Und-Adapt. As shown in Figure 6.7, these codes were interconnected in the network. Und-Meaning exhibited the relationship is cause of with Und-Adapt and Und-Understanding. In other words, users' understanding of the meaning of Culturicon would determine whether they have a better understanding of the culture and whether they can adapt to other culture. The next subsections further discuss these codes.
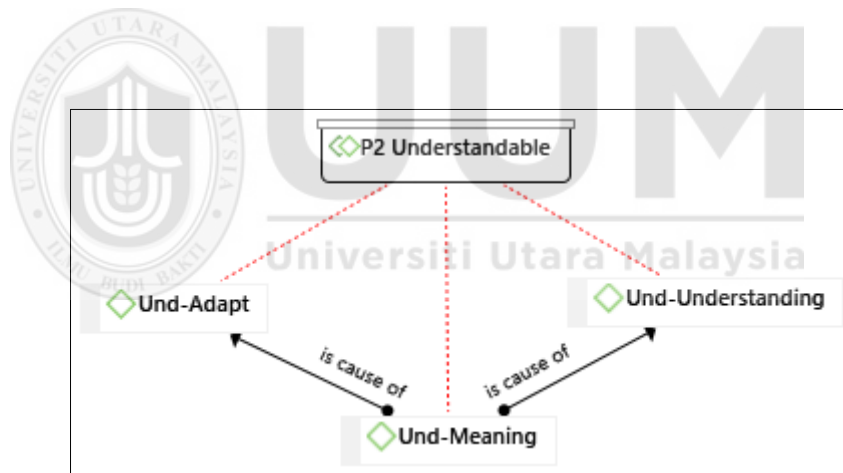
Figure 6.7. Analysis of Understandable Principle

6.3.2.1 Und-Meaning

The Und-Meaning code reflects the question of "*Based on your experience of using Culturicon, can you recognise the meaning of Culturicon?*". Figure 6.8 shows the network of Und-Meaning code.

226
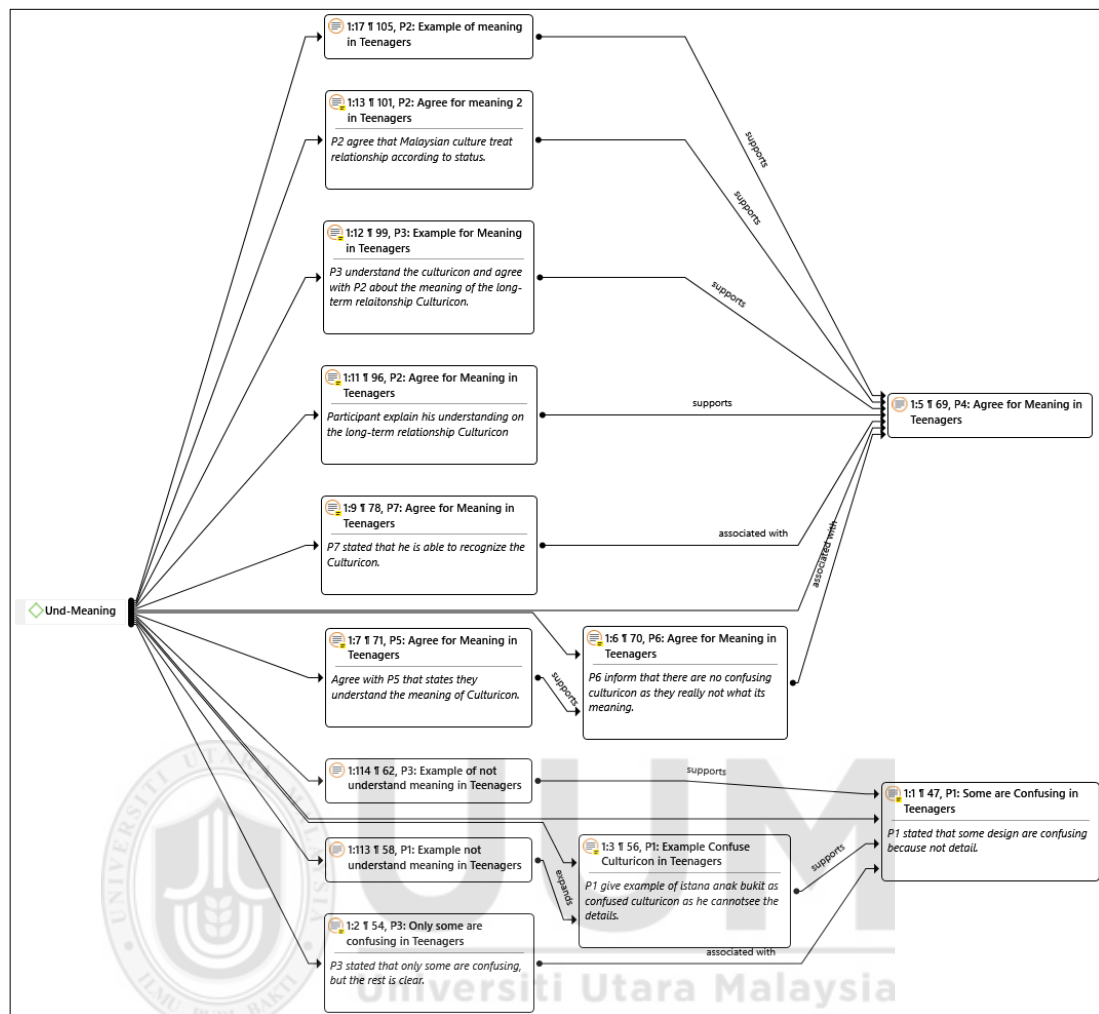
Figure 6.8. Und-Meaning Network

As shown in Figure 6.8, the majority of participants agreed that the Culturicon is recognisable. Among the responds are:

"*Confuse Culturicon tiada*". **Participant 4**

"*Saya okay, boleh kenal pasti*". **Participant 7**

"*Confuse tu tak sebab kalau tengok tu memang kami boleh tahu Culturicon tu maksud apa*". **Participant 6**

"*Setuju dengan pandangan Participant 6*". **Participant 5**

Participant 4 responded that there is no Culturicon that he confused. Participants 7 also stated that he can recognised the Culturicon. Participant 6 added that they did not confuse on the meaning of Culturicon because they can recognise the Culturicon once they saw it. Participant 5 also stated his agreement on this statement.

On the other hand, two other participants explained why the Culturicon could be confusing to some users. Among the explanations are:

"*Maksudnya yang badan purple itu yang ada duit, that's why yang kiri kanan dia dekat dengan dia*". **Participant 2**

"*So tak ada orang nak kawan*". **Participant 3**

Participant 2 explained that the person with purple color has money, that is why the people on the left and right side are closed to him. Participant 3 added that as a result, no one want to be friend with the one that has no money. In contrast, Participant 1 argued that some of the samples are confusing:

"*Bagi saya kan, ada sesetengah Culturicon tu yang saya sendiri tak nampak sangat sebab tak detail*". **Participant 1**

Participant 1 expressed her opinion by saying that she cannot really understand on the meaning of the Culturicon because the design is not detail. Following that, Participant 1 identified *Istana Anak Bukit* as an example of a confusing sample.

"*Saya tak nampak sangat itu tembok atau apa*". **Participant 1**

Participant 1 showed the *Istana Anak Bukit* Culturicon and mentioned that she can really recognise whether it is a wall or something else on the Culturicon design. On a similar note, Participant 3 identified *Bekerjasama* as another example of a confusing sample of Culturicon. However, Participant 3 said only several samples of Culturicon are confusing, while the remaining samples are recognisable.

This study gathered a total of 13 quotations from the group of teenagers. All these quotations created *explains, justifies, support,* and *associated* with relationships. Based on the quotations from the transcripts, almost all participants responded favourably that they recognised the meaning of Culturicon. A total of eight quotations expressed agreement, while the remaining five quotations expressed otherwise. The obtained findings of this code analysis showed that most samples of Culturicon can be easily recognised with minimal modification for a few sample designs for clearer display of the element of culture. With that, the participants' responses for *Und-Meaning* code in this study fulfilled one of the criteria of *understandable* principle.

6.3.2.2 Und-Understanding

The Und-Understanding code reflects the question of "*Do you think the Culturicon would assist users to have a better understanding of the Malaysian culture, especially for users of other culture?*". Figure 6.9 shows the network created based on the analysis of Und-Understanding code.
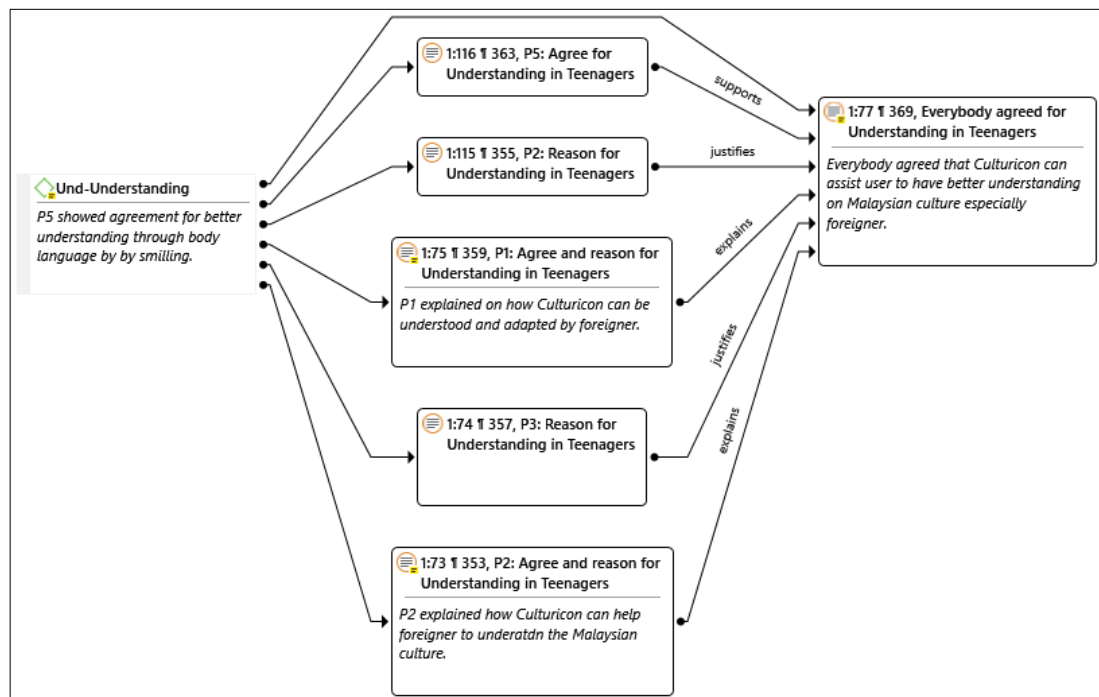
Figure 6.9. Und-Understanding Network

Referring to the transcripts, all participants agreed that Culturicon can assist users to have a better understanding of the Malaysian culture, regardless of their cultural background. In response to the question, several participants similarly agreed with the statement:

"*Kat UUM kan banyak foreigner. So nasi lemak ni memang familiar dan kalau orang luar datang, mereka suka nasi lemak. Bila mereka ada di Malaysia, mereka pun boleh guna Culturicon nasi lemak ini. Mungkin benda tu mereka dah suka dan jadi rutin harian mereka*". **Participant 1**

"*Sebagai contoh kalau saya cakap dengan foreigner I want to introduce about something, special food in Malaysia. Then saya tunjuk nasi lemak tu. So, then bila dia datang Malaysia, di nak cari nasi lemak tapi dia tidak tahu bentuk nasi lemak tu. Jadi*

230

dengan ada sticker tu, dia boleh tahu bentuk nasi lemak ni. So dia tunjuk je lah sticker nasi lemak itu dekat orang untuk dapatkan nasi lemak. Bagi saya, Culturicon akan membantu untuk navigate orang luar untuk tahu dan cari culture Malaysia".

Participant 2

Participant 1 gave example with the foreign student in UUM. She stated that foreigners also like *nasi lemak*. So, whenever these foreigners are in Malaysia, they also can use that Culturicon and make it as their routine whenever they want to find *nasi lemak*. Meanwhile, participant 2 justified participant 1's response by saying that whenever she interacts with a foreigner, she will introduce *nasi lemak* as a special food in Malaysia. She went on to say that in the future, whenever a foreigner visits Malaysia, he can use the *nasi lemak* Culturicon to order *nasi lemak* through communication. She went on to say that Culturicon can also assist foreigners in learning about and discovering Malaysian culture. Participant 2 and Participant 3 justified these responses by saying:

"*Senang nak describe*". **Participant 2**

"*Dia dapat bayangan dah*". **Participant 3**

Participant 3 backed up participant 3's response by saying that a foreigner can get a basic understanding of Malaysian culture. The obtained findings of this code analysis demonstrated that the Culturicon would assist users to have a better understanding of culture. This is due to the fact that Culturicon provides an initial impression to users by showing how culture would look like before they face the culture in real life. This

first impression helps users to avoid experiencing culture shock, as they encounter the culture of other people.

6.3.2.3 Und-Adapt

The third code under the understandable principle is Und-Adapt. This code reflects the question of "*Do you think the Culturicon would help users to adapt to other culture?*". Figure 6.10 shows the network of Und-Adapt.
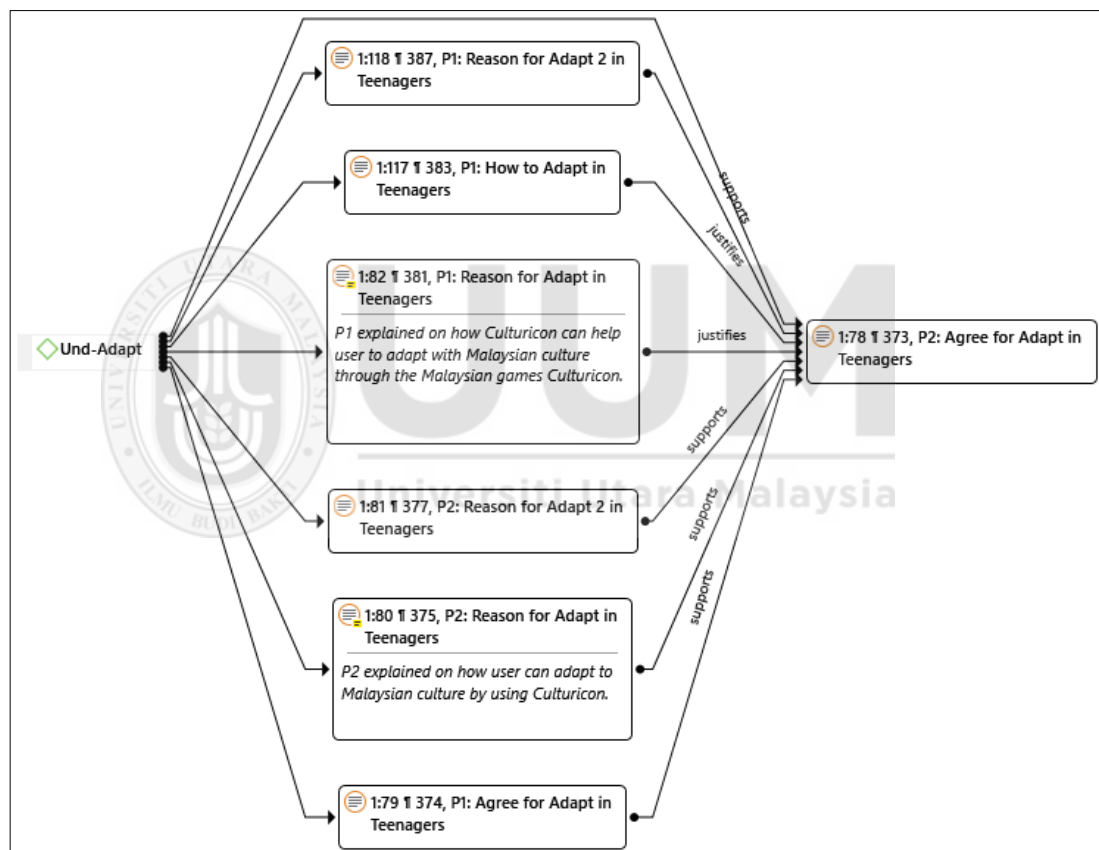
Figure 6.10. Und-Adapt Network

As shown in Figure 6.10, all participants in the group of teenagers agreed that the Culturicon would help users to adapt to other culture. Participant 1 responded that it is what Culturicon can be used for and further justified the statement by saying:

"*Mereka akan explore Culturicon lagi. So mereka boleh tahu pasal culture Malaysia. Ia membantu. Mungkin first time mereka tengok mereka akan tertanya-tanya what is this. Mereka akan bertanya kepada kita. Selepas kita explain, mesti mereka nak tengok in real life*". **Participant 1**

"*Pemakaian. Orang luar negara lebih suka pakaian-pakaian. Seperti perayaan kita, mereka pun boleh pakai baju melayu macam kita*". **Participant 2**

According to Participant 1, in order to adapt to the culture, the user will explore the Culturicon to get a sense of the culture. It may help them, even if it is difficult for them to understand at first. However, after hearing the explanations, they may want to see it in real life.

In support of Participant 1's response, Participant 2 stated that foreigners are interested in the dress. They are welcome to wear our traditional attire, such as *baju melayu*, during our celebrations.

The findings of this code analysis demonstrated that the Culturicon can provide a rough picture of a culture and demonstrate the culture of society in terms of their lifestyle, religious practices, clothes, and culinary. The different elements of culture are known as explicit culture, which are the observable reality of the culture (Trompenaars & Hampden-Turner, 1997). Using the Culturicon can result in the first impression and judgement of others towards a new culture, which help them to adapt to the society.

233

6.3.3 Findings on Attractive Principle

The third principle of the CDM is attractive. The following two questions were constructed:

1) *Do you think the design and colour of the Culturicon are attractive enough that tempt you to use it?*

2) *Do you think that having Culturicon in mobile messaging application can help to attract more users to use technology, especially among adults, where the culture is being represented digitally?*

Figure 6.11 presents the network for the attractive principle. Under this principle, two codes were created: Att-Design (analysis of Question 1); Att-Attract (analysis of Question 2). The next subsections further discuss both codes. Referring to the network relationship, the Att-Design code was identified as the cause of Att-Attract code. In other words, the design and colour of the Culturicon determine its attractiveness.
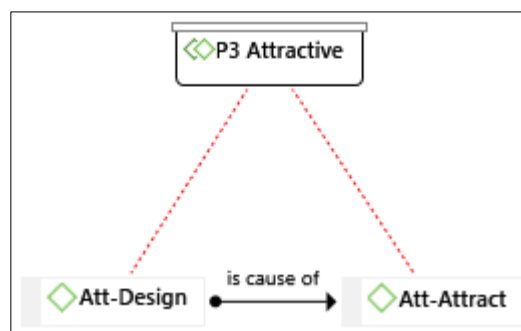
Figure 6.11. Analysis of Attractive Principle

6.3.3.1 Att-Design

The Att-Design code reflects the question of "*Do you think the design and colour of the Culturicon are attractive enough to tempt you to use it?*". A network was constructed for this code. Figure 6.12 shows the network of Att-Design code.
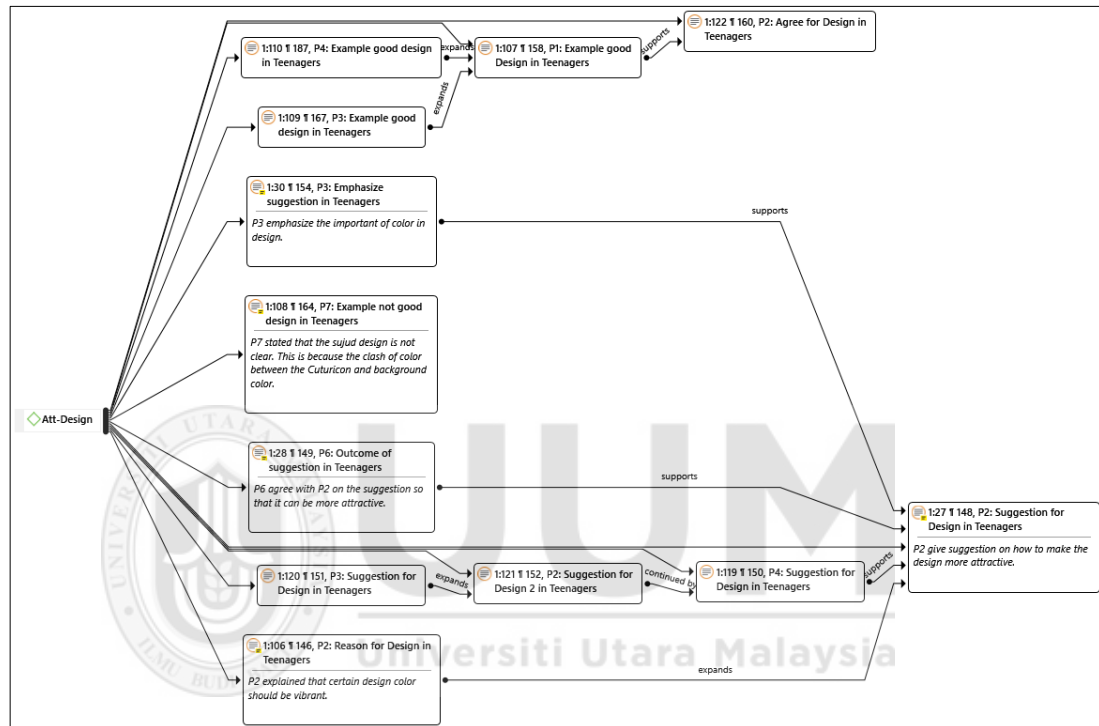
Figure 6.12. Att-Design Network

As shown in Figure 6.12, several participants from the group of teenagers agreed that the design and colour of the Culturicon are attractive enough. For instance, Participant 2 expressed agreement with the statement:

"*Ya. Itu nampak detail. Makanan-makanan kat Malaysia tu nampak detail*". **Participant 2**

Participant 2 stated that the designs are detail and mentioned that the food Culturicon design as the examples of detailed design. Participant 1 supported Participant 2's views by providing examples of good Culturicon design: ketupat, nasi lemak, and satay. The discussion on these examples was expanded by other participants:

"*Durian tu pun okay. Nampak real la jugak*". **Participant 3**

"*Yang kapal terbang ni. Sebab kami suka fly*". **Participant 4**

Participant 3 and 4 stated other detail Culturicon design by mentioning the *durian* and *kapal terbang* Culturicon. However, a few participants highlighted the need for improvements to make the Culturicon more attractive. For instance, Participant 2 suggested the need to improve the Culturicon by saying:

"*Bagi saya, colour tu macam main point dalam sticker tu. Bagi nampak dia menyerlah atau nampak apa yang nak disampaikan*". **Participant 2**

Participant 2 further suggested the need to apply more vibrant colour for the Culturicon, which was supported by two participants:

"*Sebab colour pun buat lebih tertarik. Sebab kalau tak ada colour, orang macam tak berapa nak suka pakai. Macam tak menarik*". **Participant 3**

"*Kita tengok orang depan dalam Culturicon relationship by status, kena masukkan colour sikit*". **Participant 4**

Participant 3 agreed with participant 2's response, stating that colour can make a design more attractive. User dislike designs that lack colour because they are unattractive.

Participant 4 suggested to add more colour to certain Culturicon design to make it more attractive. The suggestion provided by Participant 4 was added with:

"*Detail kat baju dia*". **Participant 2**

"*Baju-baju lusuh*". **Participant 3**

Participant 2 and 3 suggested to add more detail on the design of the Culturicon. These suggestions emphasise the details of the design. Based on this, all participants agreed that the more detailed the design of the Culturicon, the more attractive it would be.

The gathered responses from participants proved that the criteria of *attractive* principle are fulfilled despite the suggestions to improve the design of some samples in terms of visual balance and stability and use of harmonious colours, patterns, and values. Based on these suggestions, it is known that users prefer informal and humorous design over formal and serious design. The colours should also be striking and bright to attract the users' attention.

6.3.3.2 Att-Attract

The Att-Attract code reflects the question of "*Do you think that having Culturicon in mobile messaging application can help to attract more users to use technology, especially among adults, where the culture is being represented digitally?*". A network was developed for this code. Figure 6.13 shows the network of Att-Attract code.
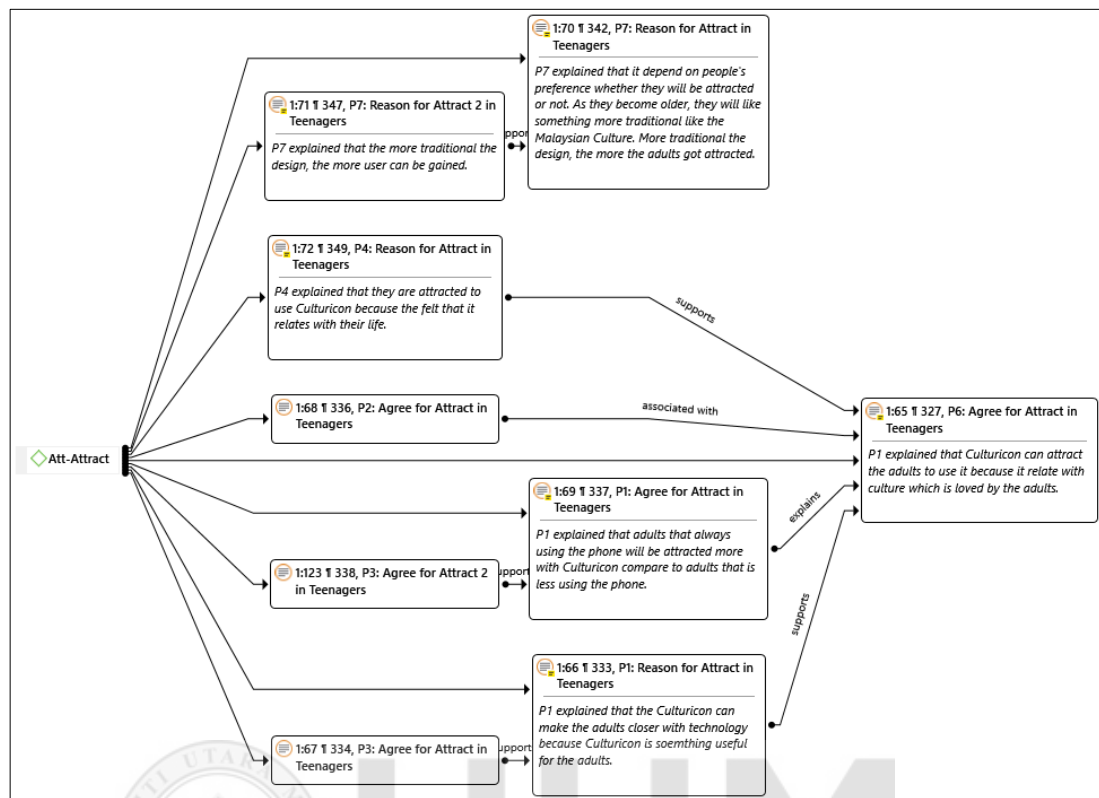
Figure 6.13. Att-Attract Network for Teenagers

All participants agreed that the Culturicon can help to attract more users to use technology. In particular, Participant 6 expressed his agreement:

"*Saya rasa ia membantu sebab kalau kita tengok golongan adults ni, dia suka sticker-sticker yang memang culture*". **Participant 6**

"*Rasa macam mereka dekat dengan teknologi. Mereka boleh selalu guna sebab kalau ada sticker yang tak berkait dengan mereka, mereka tak akan guna*". **Participant 1**

Participant 6 expressed his agreement by saying that the Culturicon can help to attract more users because, according to his observations, adults like stickers with a cultural element. Participant 1 backed up participant 6's statement by saying that adults can

238

feel connected to technology because they will use the Culturicon frequently as long as the culture element is relevant to them. Participant 1 further explained as follows:

"*Mampu menarik tapi depend on orang tu juga. Bagi siapa yang selalu tengok phone, dia akan guna*". **Participant 1**

Based on this response, Participant 1 tried to explain that adults who always use handphone are more attracted to the Culturicon as compared to adults who use handphone lesser. Adding to that, Participant 7 also offered similar response:

"*Saya rasa dia individu punya preferences. But I think for adults usually in Malaysia, I think dia macam the older they get, more traditional*". **Participant 7**

Participant 7 explained that it depends on one's preference whether they are attracted to the Culturicon. Older individuals are more likely to prefer something more traditional, such as the Malaysian culture—the more traditional the design, the more likely the adults are attracted. In support to their views, Participant 4 mentioned the following:

"*Kami pun ada di kalangan remaja, kami suka dikaitkan. So, kami akan tertarik dengan benda-benda yang sesuai yang masuk*". **Participant 4**

Participant 4 stated that even teenagers were attracted to the Culturicon because they felt that it is connected to their life. Furthermore, he said that teenagers like to be linked especially with the Culturicon that related to them.

Based on the responses from participants, it can be said that the Culturicon is able to attract more users to use technology, as it contains elements related to culture. The

239

familiarity towards the Culturicon also plays an important role in determining whether it can help to attract more users to use technology. The more familiar the Culturicon is to users, the higher the chance it can help to attract more users to use technology.

6.3.4 Findings on Coherent Principle

The fourth principle of the CDM is coherent. The following question was constructed: "*Is the sorting of Culturicon clear?*". Based on this question, Coh-Sort code was constructed for analysis.
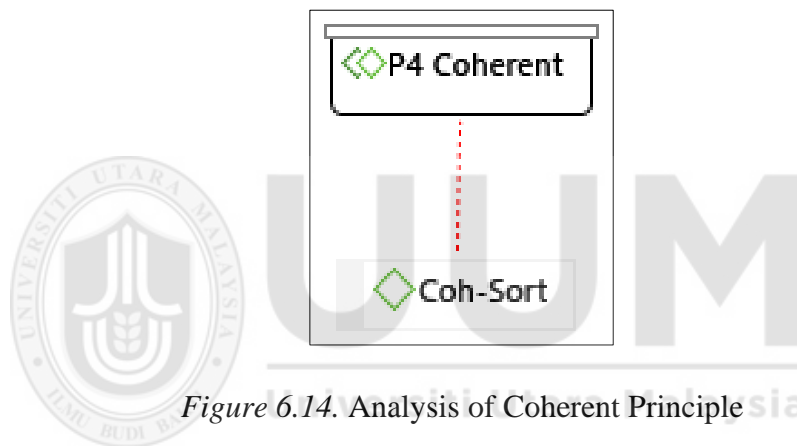
Figure 6.14. Analysis of Coherent Principle

6.3.4.1 Coh-Sort

Figure 6.15 shows the network of Coh-Sort code. Overall, the participants from both groups of participants expressed that it is easy for them to locate the position of the Culturicon.
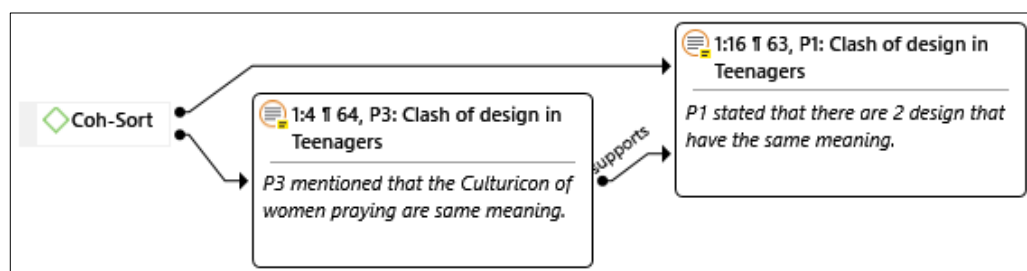
Figure 6.15. Coh-Sort Network

Participant 1 responded as follows:

"*Ha gambar tu. Saya rasa macam kalau Culturicon yang perempuan tu sembahyang, ada dua*". **Participant 1**

"*Ada dua. Jadi bertindan*". **Participant 3**

Participant 1 stated that she found that there are two Culturicon of women praying. The answer by participant 1 was supported by participant 3 that mentioned that these designs become overlap due to the same cultural element in the design.

Considering that the participants focused on the redundancy of the design of the Culturicon, the analysis emphasised the coherent principle. Thus, as for this code, it can be understood that the position of Culturicon was not an issue for the participants in this study, as they easily recalled the position. The issue lies in the redundancy of the design itself, as what most of the participants highlighted during the discussion. In other words, it can be confirmed that the criteria of coherent principle were fulfilled.

6.3.5 Findings on Informative Principle

The fifth principle of the CDM is informative. Five questions were constructed:

1) *Does the Culturicon reflect the culture in Malaysia?*

2) *Do you think Culturicon is helpful for you to express the cultural element in mobile messaging application?*

3) *Do you think Culturicon is important in mobile messaging application to express Malaysia's culture?*

241

4) *What social impact does the Culturicon have in these group message?*

5) *Any suggestion on how to express more about our culture in the form of emoticon?*

Based on these questions, five codes were created for analysis: Inf-Reflect, Inf-Important, Inf-Helpful, Inf-Impact, and Inf-Suggestion. Figure 6.16 presents the network for informative principle. One of the relationships between the codes is that Inf-Reflect is part of Inf-Important. It is important for users if the Culturion reflects the culture.

Besides that, Inf-Helpful is part of *Inf-Impact*; if the Culturicon benefits the users, it will affect users. Meanwhile, Inf-Suggestion does not have any relationship as it is used to capture users' suggestions on how to better express culture in the form of emoticon. The next subsections further discuss both codes.
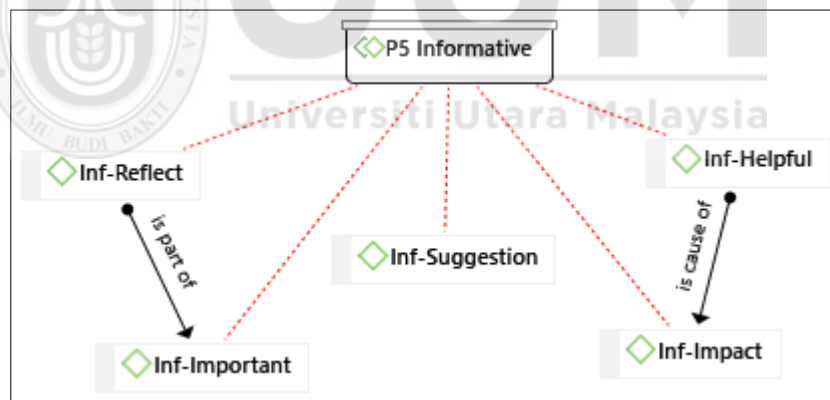
Figure 6.16. Analysis of Informative Principle

6.3.5.1 Inf-Reflect

The Inf-Reflect code reflects the question of "*Does the Culturicon reflect the culture in Malaysia?*". From this question, a network was developed for analysis. As shown in Figure 6.17, all participants agreed that the Culturicon reflects Malaysia's culture.
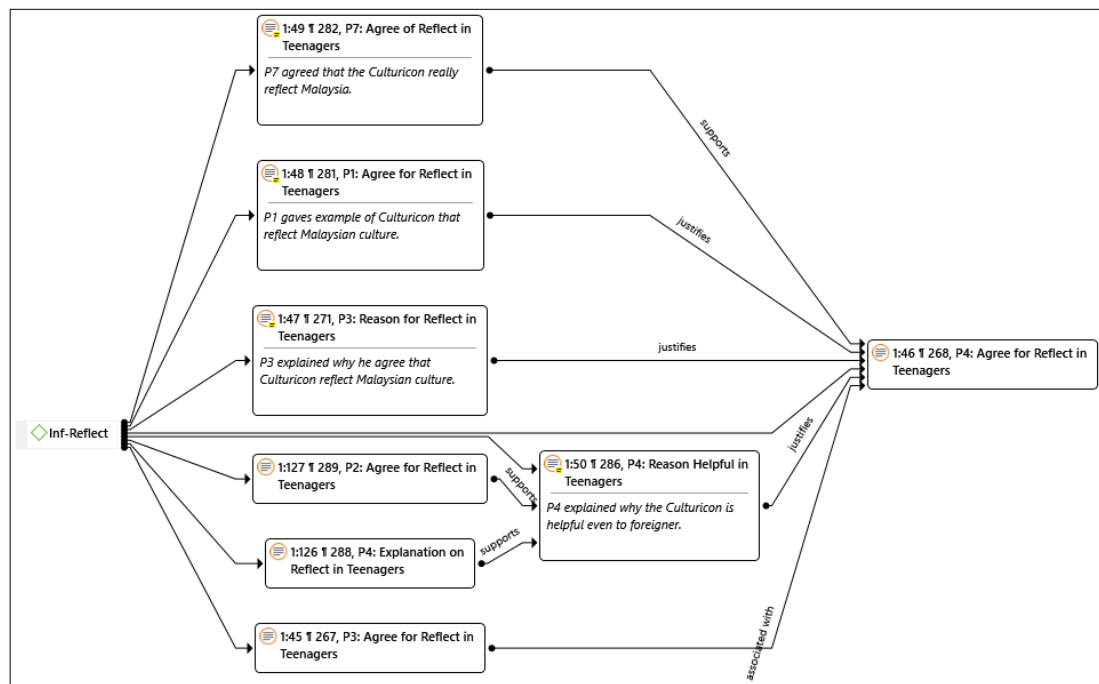
Figure 6.17. Inf-Reflect Network

The participants gave positive responses. Participant 4 responded "*reflect*" and was supported by Participant 7 who mentioned the following:

"*Saya rasa sticker itu memang menggambarkan Malaysia*". **Participant 7**

"*Reflect lagi sebab bila orang luar tengok orang kata ouh, inikah rupanya culture Malaysia kan. Mereka dah tahu food yang Malaysian makan*". **Participant 3**

"*Macam satay dengan nasi lemak kan, memang familiar kan*". **Participant 1**

Participant 7 agreed that the Culturicon reflects Malaysian culture, which was supported by participant 3 who stated that when foreigners look at the Culturicon, they can learn about Malaysian culture, such as Malaysian food. Participant 1 mentioned two familiar Culturicon foods: *satay* and *nasi lemak*.

243

Overall, the responses from participants confirmed that the Culturicon does reflect the Malaysian's culture, which fulfilled the criteria under the informative principle: design does belong to the category.

6.3.5.2 Inf-Helpful

The Inf-Helpful code reflects the question of "*Do you think Culturicon is helpful for you to express the cultural element in mobile messaging application?*". Figure 6.18 illustrates the relationships of these quotations based on the responses of participants from the group of teenagers.
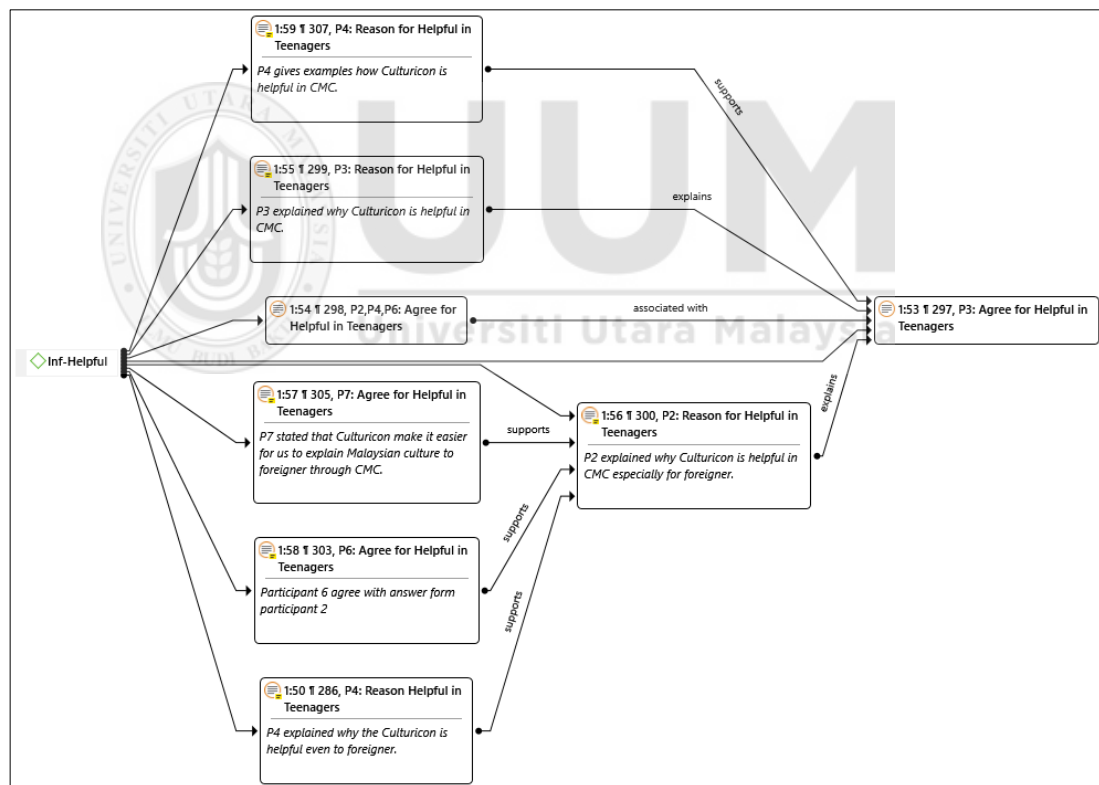
Figure 6.18. Inf-Helpful Network for Teenagers

244

As shown in Figure 6.18, it can be seen that the participants agreed that the Culturicon is helpful for them to express cultural element in mobile messaging application. In particular, participants expressed agreement and mentioned the following:

"S*ticker kan. Membantu. Macam kami yang chat dalam group itu kan, cakap lah nak pi makan satay ka camtu la. So, orang akan nampak*". **Participant 3**

"*Contoh kalau lapar nasi lemak, hantar nasi lemak (Culturicon), hantar tanda soal. Jom*". **Participant 4**

"*Contohnya macam kita bercakap dengan orang luar negara kita nak tunjukkan apa ada dekat negara Malaysia, kita tak payah ambil image yang kena download dari Google. Kita just bagi sticker apa yang ada, makanan kat Malaysia, apa budaya Malaysia. Bagi saya, dia membantu untuk kita bercakap dengan orang yang bukan Malaysia. Bukan orang warga Malaysia*". **Participant 2**

"*Betul lah. Dia memudahkan kita untuk menerangkan pada warga asing*". **Participant 7**

"*Penggunaan sticker macam habit-habit setiap hari lah. So, bila kita search kan untuk orang luar datang ke Malaysia, mereka pun nak tahu jugak apa kat dalam Malaysia ni*". **Participant 4**

Participant 3 agreed that the Culturicon is helpful for expressing cultural elements because they are relevant to their daily lives, such as the food they want to eat (satay). Participant 4 backed up Participant 3's response by stating that when they are hungry,

they can simply send the food Culturicon along with the question mark to others as a way to invite their friend to go eating.

Participant 2 also express her agreement by saying that by having Culturicon, user do not need to download image from Google anymore. User can just use the Culturicon to show food or culture in Malaysia. It can help Malaysian user to communicate with foreigner. Participant 7 also agreed with the respond by participant 2 by clarifying that Culturicon help to explain Malaysian culture to foreigner.

Then participant 4 further explained that using stickers in mobile messaging application has become a habit, so when Malaysian people search for and use the Culturicon to communicate with foreigners. When these foreigners visit Malaysia, they are also interested in learning about the Malaysian's culture. Culturicon's development can help in this situation.

Based on the discussion among the teenagers, the Culturicon is helpful for users to communicate the cultural element in mobile messaging application among the locals and those who are not familiar with the culture.

These responses reaffirmed that the Culturicon can strengthen the meaning of the message. Besides that, several texts may be substituted by a single sample of Culturicon, which can save time and space for users. Overall, the responses of the participants in this study regarding Inf_Helpful code under the informative principle proved that the criteria of users being able to interact using Culturicon in CMC and express their intention from informative principle were fulfilled.

6.3.5.3 Inf-Important

The Inf-Important code reflects the question of "*Do you think Culturicon is important in mobile messaging application to express Malaysia's culture?*". Figure 6.19 illustrates the network for Inf-Important code.
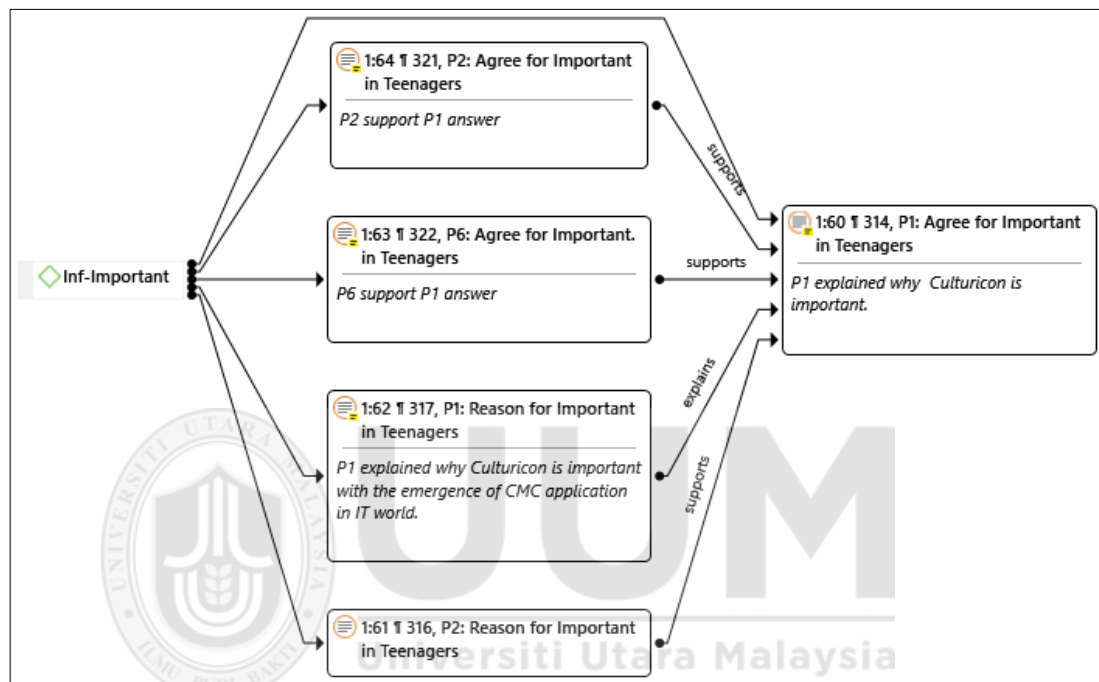
Figure 6.19. Inf-Important Network

All participants agreed that Culturicon is important in mobile messaging application to express Malaysia's culture. The participants agreed that Culturicon is important in mobile messaging application because it is like a new idea of how we can express culture. Participant 1 from this group mentioned the following:

"*Bagi saya, dia satu cadangan baru untuk menyampaikan budaya kita lah. Sebab sebelum ni orang tak terfikir. So, ini idea baru. Sebab sekarang kan semua orang memang dunia IT kan. So, benda itu akan jadi familiar sebab kita selalu guna phone,*

guna Telegram, untuk nak communicate dengan orang. So, saya rasa benda itu idea baru dan boleh membantu menaikkan culture Malaysia". **Participant 1**

According to Participant 1, the development of Culturicon is a new way to spread Malaysian culture that is relevant in today's IT world. She went on to say that the Culturicon will be familiar to users because they frequently use mobile messaging application to communicate with others. She agreed that Culturicon is significant and capable of disseminating Malaysian culture. This respond was supported by participant 2 and participant 6.

The responses from the group of teenagers suggest that Culturicon is a new idea on how to express culture digitally, which makes it an important component for mobile messaging application. Overall, the obtained responses from both groups proved that the criterion of "design concept is important" was fulfilled.

6.3.5.4 Inf-Impact

The Inf-Impact code reflects the question of "*What social impact does the Culturicon have in these group messages?*". Figure 6.20 shows the network of Inf-Impact code based on the responses of the participants from the group of teenagers.
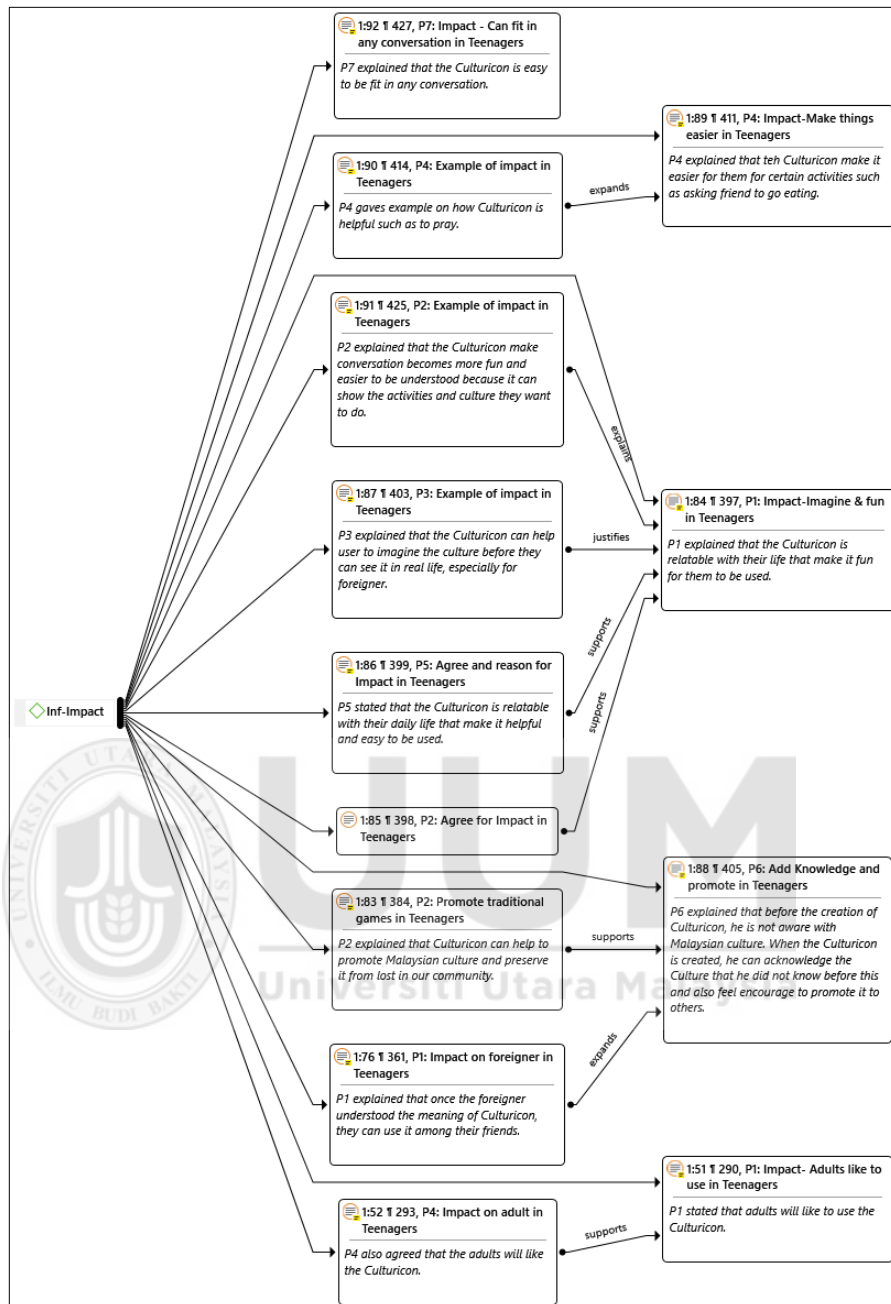
Figure 6.20. Inf-Impact Network for Teenagers

Based on the discussion among the participants, one of the mentioned social impacts

of Culturicon in group messages was that it can fit into any conversation. Participant

7 stated the following point:

"*Saya rasa sticker ni senang nak fit in any conversation. Macam let say, gambar kapal terbang ni, maybe orang kat Malaysia ni dia nak go visit his friend abroad kat luar. So, let say dia cakap tomorrow I am flying there. Lepas tu dia boleh letak gambar MAS itu. And then dia macam boleh promote lah MAS company*". **Participant 7**

Participant 7 provided an example on how the Culturicon can fit into any conversation by referring to aeroplane Culturicon (Malaysian Airline), where he said that it can be used to inform others that he will be flying abroad to visit his friends. Besides that, it also can help to promote the Malaysian Airline indirectly.

Another highlighted social impact of Culturicon was that it allows users to imagine the culture before actually experiencing it in person. Participant 1 explained how this can be possible:

"*So bila benda tu related, bila sembang ja kita boleh guna. Seolah kita nak imaginekan kat orang apa kita boleh buat*". **Participant 1**

"*Sebab sebelum ada sticker ni kita nak bagitahu orang, contoh macam kita cakap tadi orang luar kan, so depa tak dapat nak bayangkan apa yang dia ni cakapkan, buat apa, di mana. So, bila kita ada sticker ni, bila kita guna, mereka akan nampak macam bayangan".* **Participant 3**

Participant 1 explained that when the Culturicon is relevant to their lives, they can use it as an imagination to others about what they are doing. This statement was supported by participants 2, 3, and 5, with participant 3 stating that prior to the existence of Culturicon, when attempting to communicate about culture with others, particularly foreigners, it was difficult for the foreigner to imagine it. As a result, having Culturicon

250

can help a foreigner imagine the culture. It's as if they have a basic understanding of the culture through the usage of Culturicon.

In relation to this social impact, Participant 2 justified that the Culturicon can make conversations more interesting and easier to understand because it can show the activities and culture they want to experience. Participant 2 further added the following point:

"*Bagi saya bila saya guna tu nampak lagi fun la. Bila saya interact dengan sir ke. Dengan kawan-kawan yang lain dalam group Telegram kita tu. Memang sampai la. Macam jom kita gi bersukan kat stadium. Dengan adanya sticker tu, boleh tunjuk lah apa aktiviti-aktiviti kita nak buat*". **Participant 2**

"*Culturicon ni, dia memudahkan kita. Kadang-kadang nak ajak makan satay kan, send gambar satay cukup lah. Orang faham kan. Contoh lah kan. Sembahyang kan. Kadang-kadang ada orang tak sembahyang, ajak lah dia sembahyang, buh gambar orang duk sembahyang tu*". **Participant 4**

Participant 2 explained that the Culturicon made the conversation more enjoyable and helped others understand what he was saying correctly. He used the Culturicon stadium as an example to encourage others to participate in sports activities. He also stated that the current Culturicon can be used to display other types of activities.

In addition, the participants noted that Culturicon allows users to express their intention in an easier way. Participant 4 stated that the Culturicon simplify the user's task. He explained that Culturicon makes it easier for users to describe certain

activities, such as asking a friend to have a meal together or inviting a friend to a prayer.

The participants also noted other social impacts of Culturicon, namely cultural knowledge transfer and promotion of culture. Participant 6 suggested the following point:

"*Impak pada saya sebelum. Sebelum saya tahu ada sticker ni, saya macam tak berapa nak fokus sangat pasal culture-culture dalam Malaysia. So bila dah develop, ada sticker, saya nak macam promote sticker, kita kena promote kita punya culture dekat orang luar"*. **Participant 6**

"*Dengan ada sticker tu kita macam first step untuk promote lagi game-game tradisional Malaysia supaya macam tak hilang lah culture tu*". **Participant 2**

Participant 6 clarified of not being aware of the Malaysian culture before using the samples of Culturicon. The participant noted that using the Culturicon allowed him to recognise the element of culture that he was previously unaware of and be motivated to spread the cultural knowledge to others.

This response was supported by Participant 2. Participant 2 clarified that the Culturicon can promote and preserve Malaysia's culture. Participant 1 further expanded this point: "*mereka pulak guna sesama mereka*" when referring to foreigner that already used and understood the meaning of Culturicon.

The final social impact that was discussed among the participants from the group of teenagers was that the likelihood of adults enjoying the use of Culturicon. Participant

1 suggested the following point: "*satu lagi mesti golongan dewasa macam mak ayah kan, mesti akan suka guna sticker ini*". This point was supported by Participant 4: "*Adults mesti akan suka*".

According to the discussion about the social impact of Culturicon, one of the impacts gathered is that it can fit into any conversation. Because Culturicon is about the user's culture and events in their daily lives, it can assist in expressing their activities in CMC. They can simply describe and enhance the content of their message with the Culturicon. By doing so, people from other cultures can imagine and get a sense of what the culture is all about. This result is similar to the statement by Alismail and Zhang (2020), Feng et al. (2020) and Teh et al. (2020) that stated the emoticon provide better additional cues than text where it can enrich the exchange of emotional information.

Aside from that, the presence of Culturicon makes their conversation more enjoyable and fun. The design of Culturicon plays an important role in making them feel attracted to use the Culturicon, making their conversation more interesting when compared to a text-only conversation. It not only makes the conversation more enjoyable, but it also assists the receiver in correctly understanding the meaning of the message.

In addition, Culturicon also assists user by simplifying users' task in expressing the intention regarding culture. Before this, user need to explain to receiver by typing the message which takes time for the sender to type and also for the receiver to read and interpret. By having Culturicon, sender can express their intention by a single click to select appropriate Culturicon and send to receiver. Receiver also do not need much

time to read and understand the meaning of the message. This can save the time for both sender and receiver.

Another participant's response is that it can help to improve their knowledge of their own culture and foster a sense of nationality. Teenagers nowadays lack knowledge about their own culture as a result of a lack of practise in their daily lives. Culturicon can help them gain a better understanding of their own culture, such as traditional clothing and games. When they learn about these cultures, they will appreciate them and help to preserve them. One method of preserving it is to spread and use it in CMC. Not only does it help to preserve Malaysian culture, but it also helps to promote Malaysian culture globally, as CMC is used all over the world.

Overall, based on the gathered responses, the criteria under the *informative* principle that users are able to interact using Culturicon in CMC and express their intention through Culturicon were fulfilled.

6.3.5.5 Inf-Suggestion

The Inf-Suggestion code reflects the question of "*Any suggestion on how to express more about our culture in the form of emoticon?*" Figure 6.21 shows the network of Inf-Suggestion code for the group of teenagers.

254
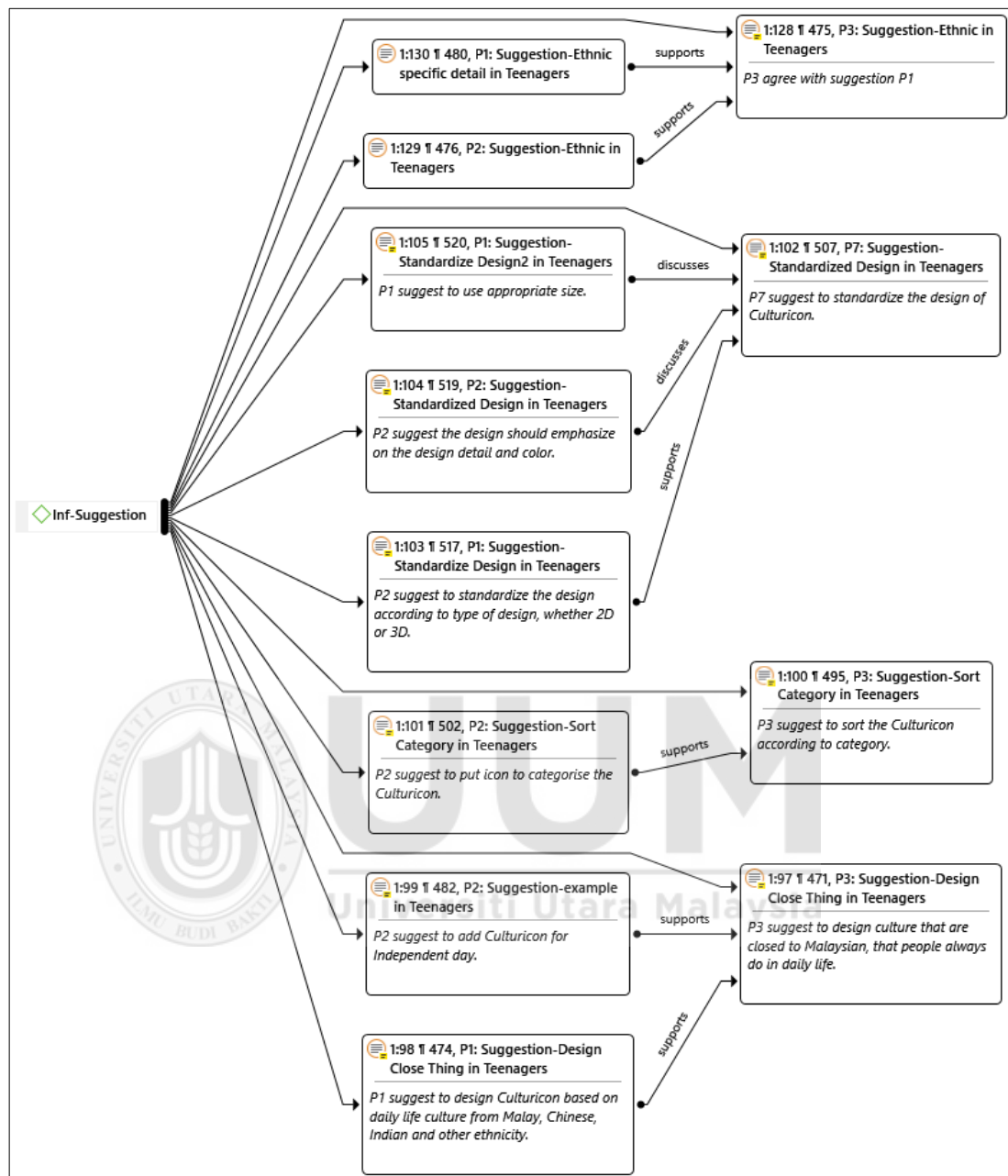
Figure 6.21. Inf-Suggestion Network for Teenagers

One of the suggestions discussed in this group was the need to standardise the design, which was first stated by Participant 7:

"*Saya rasa, before adding more stickers, the sticker should be, macam standard dia mesti sama each other. So, dia konsisten before updating more stickers*". **Participant 7**

"*So macam kita guna 3D, 3D ja semua 2D, 2D*". **Participant 1**

"*Ataupun kalau ada yang berbeza pun boleh jugak. 2D, 3D tak ada masalah. Bagi saya yang lebih kita kena tekankan macam warna dan detail tu. Dalam satu image tu*". **Participant 2**

Participant 7 suggested that the design of Culturicon must be consistent before a new design is created. This response was supported by Participant 1 that suggested to standardise the design based on the type of design, whether it is 2D or 3D for all of the Culturicon. Participant 2 further discussed this suggestion by highlighting the need to emphasise the details and colours of the design.

Participant 1 added another response in relation to the suggestion:

"*Saiz. Yang ada macam yang, ada satu yang Culturicon yang sujud tu. Dah la dia warna hitam and dia nampak macam lebar sangat. So nampak macam memek*". **Participant 1**

"*Ataupun kita boleh jugak sort dia macam Malaysian Food Culture kah. So sini semua food*". **Participant 3**

"*Contohnya, kat sticker ni, dekat tepi ni kita boleh tambah kat Telegram tu kita boleh letak icon contohnya macam ini untuk culture ini, ini untuk game, ini untuk keadaan apa-apa. So macam categorise kan*". **Participant 2**

256

To avoid a skewed design, Participant 1 suggested using appropriate size and margin. This is because one of the Culturicon designs appears to be skewed and not in the proper margin. It makes the design appear unappealing. Then participant 3 added another suggestion, which is to sort the Culturicon by category, such as food. This suggestion was supported by participant 2, who suggested adding a category icon to the side of the Culturicon selection list to categorise the Culturicon.

In continuing the discussion, participant 3 then added the following point on sorting according to ethnicities in the discussion:

"*Orang akan lebih tahu culture Malaysia ni macam mana. Macam kita kan ada tiga bangsa. Bangsa ni macam ni, bangsa ni macam ni*". **Participant 3**

"*Kalau buat kaum pun boleh jugak. Kaum Iban*". **Participant 2**

"*Ya. Lepas tu kita spesifik kan dia, bagi nampak detail dia, dia punya colour apa semua tu macam kita kata tadi. So, orang akan lebih faham lah. So dia tak ada lah jadi macam terpinga-pinga benda apa ni*". **Participant 1**

Participant 3 continues by suggesting that the Culturicon be categorised based on race, as Malaysia has three major races: Malay, Chinese, and Indian. Because these three are culturally diverse. As a result, categorising it will make it easier for the user to choose. Participant 2 agreed, even suggesting that another race, such as Iban, be added to the category list. Participant 1 then added that the design should be more detailed, particularly in terms of colour, so that it is more understandable to the user.

The final suggestion proposed from the group of teenagers was to incorporate the element of culture that is close to the people. Participant 3 responded as follows:

"*Kita ambil benda yang dekat dengan kita. Yang selalu orang buat, so orang akan lebih minat dan tertarik nak guna*". **Participant 3**

"*Macam budaya seharian kehidupan kita kan. Chinese macam mana, Indian macam mana, Melayu macam mana kan. Kita masukkan itu jadi Culturicon. So, orang guna, so dia nanti slide. Macam bila orang luar masuk, dia tengok what is this? So, bila orang guna dia mesti nak tahu apa dan dia akan explore*". **Participant 1**

"*Contoh culture yang boleh tambah macam hari merdeka, benda yang culture kita kan. Macam hari merdeka macam mana*". **Participant 2**

Participant 3 suggested to design cultural elements that Malaysians can relate to and use in their daily lives. When the design is relatable and close to them, it will pique their interest and tempt them to use it. Participant 1 added to this suggestion by saying that the daily activities of Malaysians of various races could be added to the selection list based on their category. When the Culturicon are sorted by category, it makes it easier for both local and foreign users to use. In fact, it can intrigue a foreigner's interest in the culture and make them want to learn more about it.

Based on the discussion on suggestion code, among the suggestion is to standardise the design. Culturicon's design should be standardised so that it looks consistent. This suggestion is understandable given that the current Culturicon design is inconsistent due to the fact that it was created by five designers, where each of them has their own way to design. As the current Culturicon selection are used for validation purpose, the

standardization of all Culturicon were not considered yet. In future, the consistency of the design will be considered.

Another suggestion is to design with appropriate size and margins. Actually, the Culturicon design specification has been handed to these designers, and the design must be 512 * 512 pixels with a transparent background. The majority of the design adhered to these specifications. Perhaps one or two designs were overlooked during the design process. In the future, design specifications will be thoroughly assessed to ensure that all designs adhere to the appropriate specifications.

The third suggestion is to categorise the Culturicon and add the category icon to differentiate it. This suggestion can be considered for future addition of Culturicon selection. The current Culturicon selection are sorted according to its category but are located within the same pack, which is Malaysian Culture. In future, the pack will be categorised in more detail.

The final suggestion is to incorporate cultural elements that are close to the user. This is one of the goals of the proposed model's development: to create an icon that is familiar and understandable to users, particularly Malaysians. Because the sample of Culturicon designed by designers was for validation purposes only, it may not cover the entire culture of Malaysia. Culturicon's sample will be expanded in the future to include more Malaysian culture.

6.3.6 Findings on Distinct Principle

The sixth principle of the CDM is distinct. For this principle, two questions were constructed:

1) *Is the Culturicon design different from other designs?*

2) *Should there be any additional cues for the Culturicon?*

As shown in Figure 6.22, two codes were created for analysis: Dis-Differ code and Dis-Cue code. Figure 6.22 also shows the relationship between these two codes, where the Dis-Cue code is the cause of *Dis-Differ* code. This implies that, with additional cues for the Culturicon, the design of Culturicon would be different. The next subsections further discuss these codes.
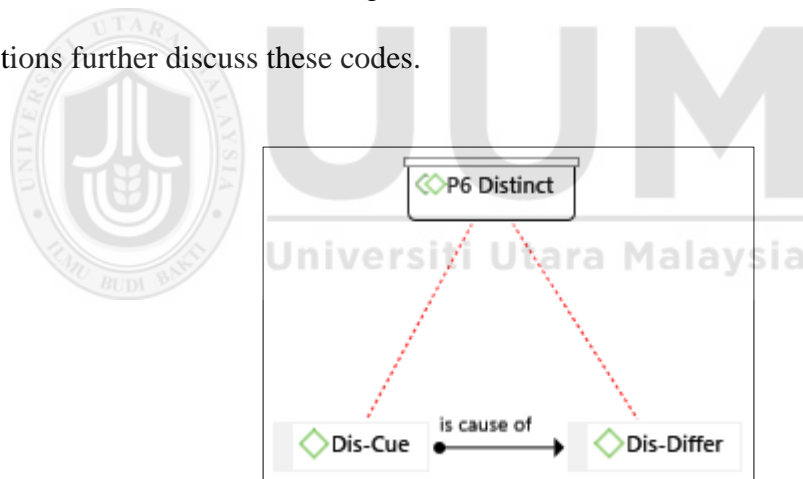
Figure 6.22. Analysis of Distinct Principle

6.3.6.1 Dis-Differ

The Dis-Differ code reflects the question of "*Is the Culturicon design different from other designs?*". Figure 6.23 shows the network of Dis-Differ code.

260
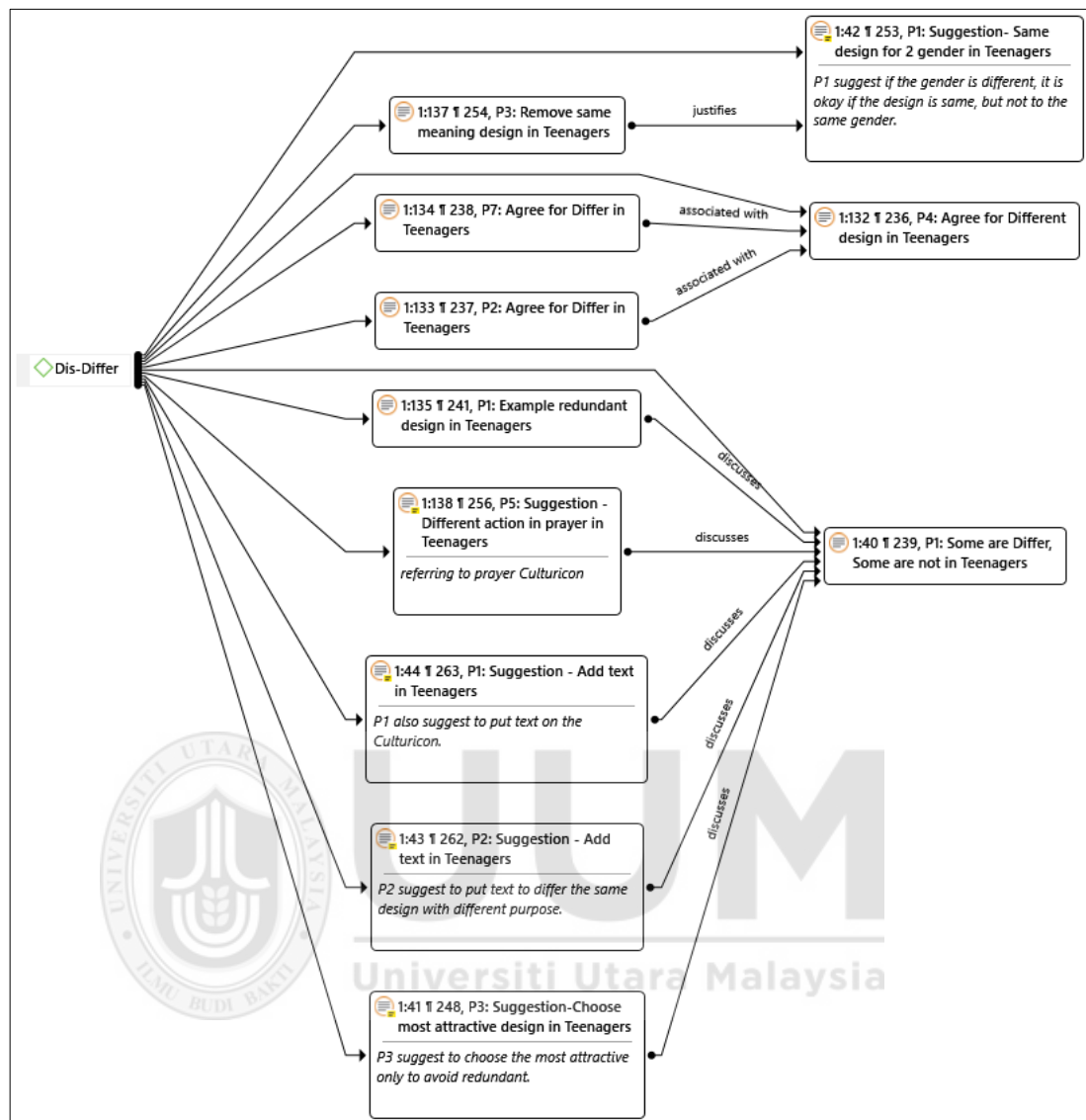
Figure 6.23. Dis-Differ Network for Teenagers

Based on their discussion, three participants (Participant 2, Participant 4, and Participant 8) stated that the design of Culturicon is different from other designs. Meanwhile, the other participants mentioned that some of the designs are different, but some designs are similar:

"*Berbeza dan ada yang sama. Ada yang macam solat*". **Participant 1**

After responded that some designs are different, but some are familiar, participant 1 identified the prayer design samples as examples of Culturicon with the same design. Based on this response, the participants started to discuss on how to solve the issue. Participant 5 suggested designing different activities for prayer ("*gaya berbeza*"). Following that, Participant 3 suggested to select only the best design. Then, Participant 1 and Participant 2 came up with an idea of adding texts to the Culturicon. Participant 2 mentioned the following point:

"*Ataupun kat belakang tu tambah for Friday punya ke. Solat-solat raya. Itu memang culture Malaysia*". **Participant 2**

"*Tak pun kita tambah atas tu Friday prayer*". **Participant 1**

Participant 2 suggested to add text for the prayer Culturicon to differentiate between the prayer Culturicon design as there are many types of prayer for Muslin in Malaysia. Then participant 1 suggested the same thing, only the position of text is different where she suggested to add text on top of the Culturicon design.

On the other hand, Participant 1 highlighted another point:

"*Kalau macam lelaki perempuan tidak mengapa asingkan. Kalau macam perempuan tu kan ada dua. So macam tak payah kot*". **Participant 1**

Participant 1 stated that it is acceptable if the samples with different genders share the same meaning, but it should be modified if the samples show the same gender and share the same meaning. Following that, Participant 3 justified the point made:

"*Sebab maksud sama ja kan*". **Participant 3**

262

The feedback revealed split views on the design samples. Most of the participants highlighted no differences in the design samples of Culturicon. To clarify, some of the design samples are actually different, but share similar meaning. However, the participants agreed that, in order to prevent redundancy in the selection of Culturicon samples, it is important to exclude Culturicon samples that share the same meaning. As this samples were used for validation purpose, all of the samples of Culturicon from the designers were uploaded into the Culturicon selection list despite their similar meaning. For future work, the design with the similar meaning will be removed.

6.3.6.2 Dis-Cue

The Dis-Cue code reflects the question of "*Should there be any additional cues for the Culturicon?*". Figure 6.24 shows the network of Dis-Cue code.
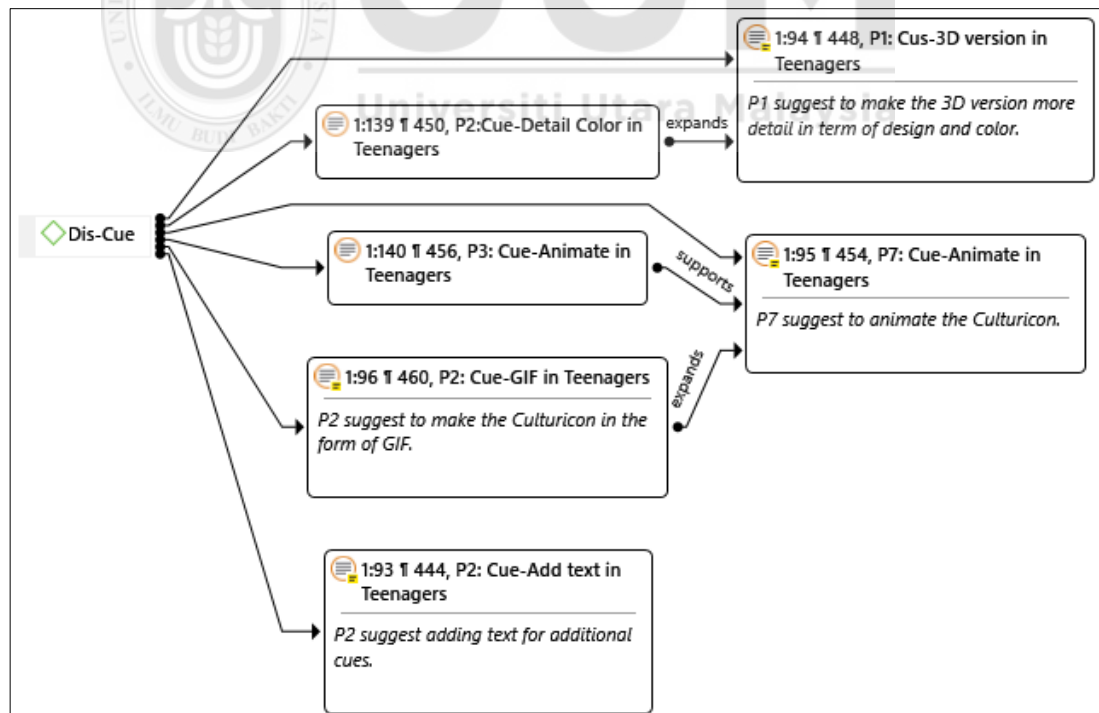
Figure 6.24. Dis-Cue Network for Teenagers

263

One of the responses included adding texts for the Culturicon:

"*Kalau klu tambahan ini kita boleh tambah dengan perkataan macam solat berjemaah ni, kita nak tunjuk ni solat jumaat, tulis Friday prayer*". **Participant 2**

"*Gambar tu mungkin kita boleh detailkan dia jadi 3D punya version, dengan colour dia*". **Participant 1**

Participant suggested the same suggestion discussed in previous code, which is by adding texts for example congregational prayers and Friday prayer. In addition, participant 1 also suggested to upgrade the design of Culturicon to the 3D version and enhance its colour.

This suggestion was expanded by Participant 2:

"*Yes. Itu adalah warna punya detail lah. Dari segi pakaian dan design tu*". **Participant 2**

This means that the designer should emphasise the design's colour and style, making it more detailed. As previously agreed, the more detail the design, the easier it is for the user to understand.

Participant 7 also contributed to the discussion by suggesting that the Culturicon should be in animation form:

"*Animate kan sticker tu*". **Participant 7**

"*Banyak dalam Telegram, sticker dia bergerak. So macam lagi more fun la*". **Participant 3**

In supporting the respond by participant 7, participant 3 stated that many stickers in the Telegram selection are animated, which make them more enjoyable to be used. In relation to this concept, Participant 2 suggested producing the samples of Culturicon in GIF format.

Based on the discussion, participants responded to the *Dis-Cue* code discussion by adding text, creating a 3D version, improving the colour of the design, and animating the design. All of these suggestions are good for improving and providing additional cues to the Culturicon design. The concepts are also fresh and relevant to the current mobile messaging application technology.

6.3.7 Findings on Memorable Principle

The seventh principle of the CDM is memorable. For this principle, the question of "*Can you clearly remember and identify the Culturicon after you used it for the first time?*" was addressed. As shown in Figure 6.25, Mem-Remember code was created.
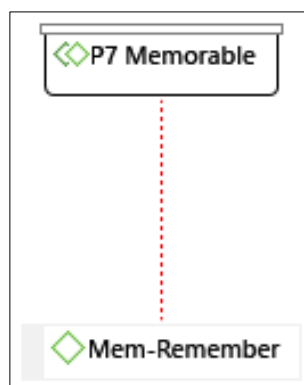
Figure 6.25. Analysis of Memorable Principle

6.3.7.1 Mem-Remember

The Mem-Remember code reflects the question of "*Can you clearly remember and identify the Culturicon after you used it for the first time?*". Figure 6.26 shows the network of Mem-Remember code.
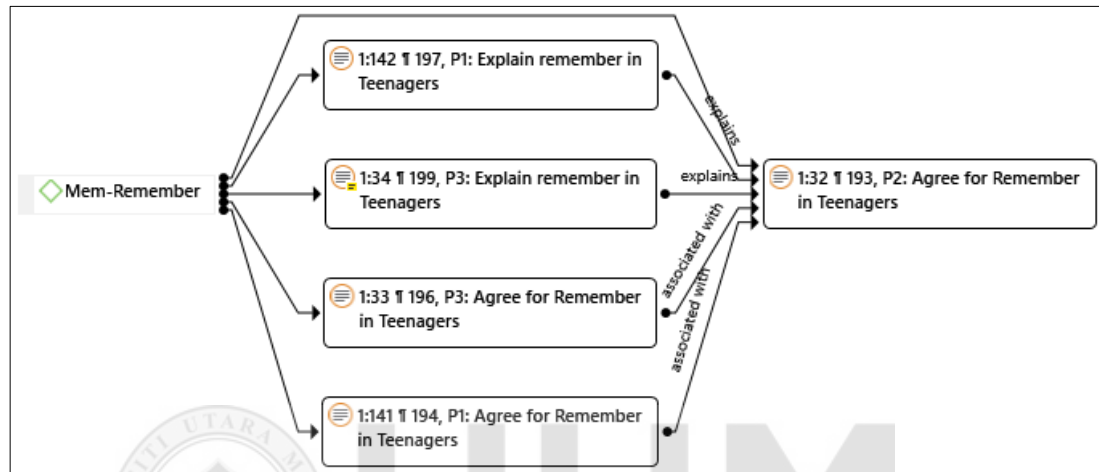
Figure 6.26. Mem-Remember Network for Teenagers

All participants from the group of teenagers responded that they can clearly remember and identify the Culturicon after they used it for the first time. Participant 1, Participant 2, and Participant 3 responded "*boleh*" when they were asked this question, while the other participants expressed their agreement through body language.

Participant 1 explained that they initially had to look at the available selection of stickers to see the design samples of Culturicon that are included:

"*Mula tengok semua dulu apa yang ada*". **Participant 1**

"*Dah tahu dah. So apa yang kita cakap, Culturicon apa yang sesuai dengan permintaan kita*". **Participant 3**

266

Then, participant 3 added another explanation that they are aware of the appropriate design samples of Culturicon for the conversations that took place and the location of these samples after they used it for the first time.

The feedback proved that the criteria under the memorable principle were met, as the participants were able to clearly identify the Culturicon and agreed on the striking and vivid attributes and are clearly place in the scheme of interface.

6.3.8 Findings on Legible Principle

The eighth and final principle of the CDM is legible. As shown in Figure 6.27, Leg-Recognise code was created based on the question of "*Can you see and recognise the Culturicon at reading distances?*".
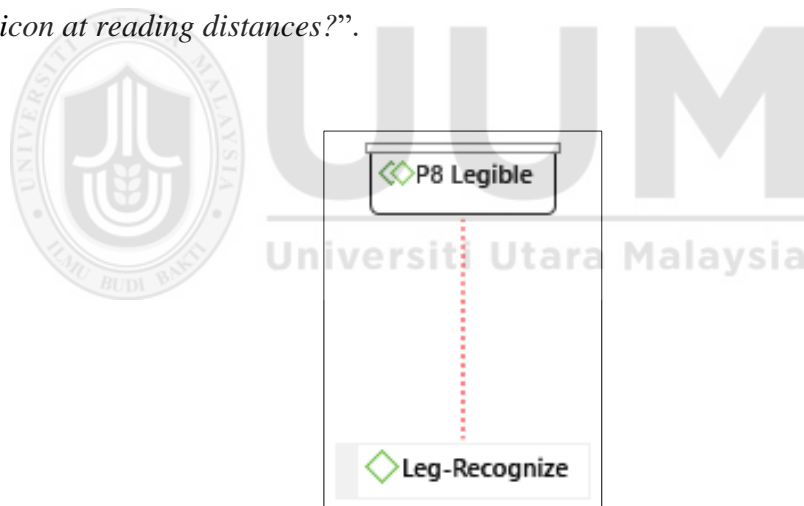
Figure 6.27. Analysis of Legible Principle

6.3.8.1 Leg-Recognise

The Leg-Recognise code reflects the question of "*Can you see and recognise the Culturicon at reading distances?*". Figure 6.28 shows the network of Leg-Recognise code for the group of teenagers. The split opinions for this question were deemed somewhat surprising. Some of the participants from the group of teenagers responded

267

that the Culturicon can be seen and recognised at reading distances, but other participants responded otherwise.
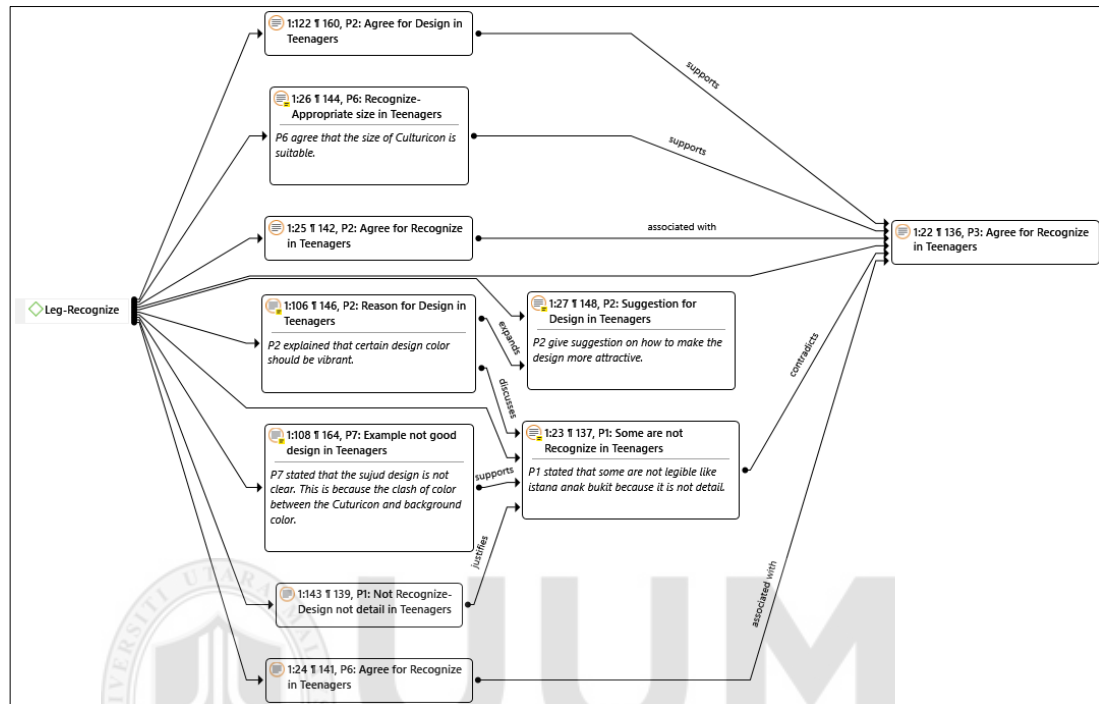
Figure 6.28. Leg-Recognize Network for Teenagers

The following participants expressed their agreement that they can see and recognise the Culturicon at reading distances:

"*Ya. Itu Nampak detail. Makanan-makanan kat Malaysia tu. Nampak detail*". **Participant 2**

"*Boleh nampak*". **Participant 3**

"*Saiz macam ni dah suitable lah*". **Participant 6**

Participant 2 and 3 noted the detailed design samples of Culturicon, especially the food design samples, while participant 6 noted the appropriateness of the size of the design samples.

On the other hand, participant 1 implied that some samples of Culturicon cannot be seen and recognised:

"*Ada sesetengah tu. Macam istana anak bukit*". **Participant 1**

Participant 1 also stated that some samples of Culturicon are not legible, such as the *Istana Anak Bukit*. Participant 1 further justified that some of the design samples are not detailed:

"*Ha. Tak Nampak sangat. Sebab dia macam tak detail*". **Participant 1**

Besides that, participant 7 identified the sujud design sample as an unclear design sample of Culturicon:

"*Yang sujud tu tak nampak sangat*". **Participant 7**

Based on the respond by participant 7, all participants discussed and discovered a possible reason for this issue—the colour difference between the Culturicon and the background. This is due to the similar colour used for the Culturicon and the background. Focusing on this, Participant 2 suggested the following point:

"*Maybe ada certain gambar kena ada kaler lagi vibrant"*. **Participant 2**

This suggests that the colour of the design samples should be more vibrant and contrast with the background colour. Colour is crucial in terms of being seen and attractive.

269

Overall, the responses proved that the first criterion on the legibility of the design at reading distances under the legible principle was met. Most of the participants agreed that the size of the Culturicon is suitable for mobile messaging application. The only issue raised among the participants during the discussion was the lack of clarity in the details of several design samples, especially those complex design samples that involve place or destination. A detailed design is necessary.

The second criterion on the foreground-background contrast under the legible principle was also met. Almost all participants from both groups agreed that the foreground-background contrast is sufficient. Only one participant from the group of teenagers reported that there is one design that is too close to the background colour, which makes it difficult to be seen clearly. Apart from that one particular design, all design samples fulfilled this criterion.

6.4 Explanatory Sequential Mixed Method Interpretation

Following the qualitative data collection and analysis, the data interpretation step was carried out to analyse both quantitative and qualitative data. As the HCI icon principle was a part of the qualitative data collection and analysis (because end-user validation was measured in terms of the HCI icon principle), the HCI icon part data from quantitative data analysis were used to interpret the explanatory sequential mixed method.

According to (Creswell, 2014), the interpretation in explanatory sequential mixed method is about how the qualitative findings help to explain the quantitative results. In doing so, the results from both quantitative and qualitative are shown in Table 6.3.

270

Table 6.3

Explanatory sequential mixed method interpretation

Principle	Quantitative	Qualitative
Familiar	100%	All participants responded they are familiar with the Culturicon.
Understandable	100%	Most of participants agreed that the Culturicon are understandable.
Attractive	100%	All participants agreed that the Culturicon are attractive.
Coherent	100%	All participants agreed that the Culturicon are coherent.
Informative	100%	All participants agreed that the Culturicon are informative.
Distinct	100%	Several participants stated that some designs are similar.
Memorable	100%	All participants agreed that the Culturicon are memorable.
Legible	100%	Most participants stated that the Culturicon are legible, only two participants stated that some Culturicon are not legible.

Note: Percentage in quantitative data indicate the percentage of agree.

In quantitative data, all principles scored 100 percent agree, as shown in Table 6.3. This demonstrates that all designers agreed on the HCI icon design principle's components to be included in the CDM. They agreed based on their previous experience using the model to develop a sample of Culturicon. As a result, the designer has demonstrated that the principles of familiar, understandable, attractive, coherent, informative, distinct, memorable, and legible are relevant to CDM.

Meanwhile, the data from qualitative shows that there are five principles that were agreed by all participants, 1 principle (Legible) that was agreed by most participants, and 1 principle (Distinct) that was agreed by several participants.

For the familiar principle, all designer agreed with the principle and all end user responded that they are familiar with the sample Culturicon. End users stated that they are familiar with the Culturicon because they are the culture that always happened and can be seen in their environment. Besides that, the Culturicon are also relatable with their lives. That's why they are familiar with the Culturicon.

All designers agreed on the understandable principle, and all end users stated that they understood the meaning of the Culturicon. The end user stated that they recognised the Culturicon and were not perplexed by its meaning. They can use it immediately in their CMC. Only that they suggested that certain Culturicon be designed with more detail to make it easier to recognise, especially by foreigners.

The same results were scored by the attractive principle, with all designers agreeing with the principle and all end users agreeing that the Culturicon are attractive. All end users agreed that the Culturicon design is mostly attractive because it is detailed and has vibrant colours that draw their attention to use. They also made suggestions on how to improve other designs.

For coherent principle, same results were gathered where all designers agreed with the principle and all end user agreed that the Culturicon are coherent. Only that 1 participant stated that there are design that redundant. As this principle is used to

272

measure the consistency of the design and its associate, the sorting of the Culturicon must be clear where one Culturicon begin and end. As it turned out, the designs are different, only that the culture element are similar. This is due to several designer selected the same culture element to be designed. This clash of culture element of Culturicon will be removed after the validation process.

For the informative principle, all designers agreed with the principle and all end users agreed that the Culturicon are informative. All end user agreed that the Culturicon are informative that it really reflect the Malaysian's culture. The Culturicon not only can be informative to Malaysian, but also informative to foreigner. They also agreed that the Culturicon are helpful to them to use in CMC. By using the Culturicon, it helps them to save the attention. Save attention means that they can save the time for typing, reading, and interpreting the Culturicon. Compared to texting, they need to take some time to time the message, read the message and understand the message. But, by using Culturicon, just by a single click can save the time for the mentioned activity. Hence, it is proven that the Culturicon are informative to end user.

For the distinct principle, all designers agreed with the principle, while several participants stated that some designs are similar. The reason for these responds is similar with the coherent principle, the clash of culture element chosen to design the Culturicon. As the sample of Culturicon were used for the validation purpose only, the designs that possess similar meaning will be removed after the validation process finished.

For the memorable principle, all designers agreed with the principle and all end -user agreed that the Culturicon are memorable. All participants stated that they memorized the Culturicon for the conversations that took place and the location of these samples after they used it for the first time. So, when they want to use it again, they know where the location of the Culturicon and how to use it.

For the last principle, the legible principle, all designer agreed with the principle. For end user, most participants stated that the Culturicon are legible, only two stated that some Culturicon are not legible. Most participants stated that the size and detail of the Culturicon are legible especially the food Culturicon. But one participant stated that there are some Culturicon are not legible due to vague design, for example the Istana Anak Bukit Culturicon. As the design are not detail, it's quite difficult for the participant to recognise it. Meanwhile, another participant stated that some designs are not legible due to the clash of the Culturicon colour and the background colour.

Based on the respond by these two participants, it is noted that the design must be detail for all Culturicon, especially for the place Culturicon to avoid confusedness. It is also noted that the dolour of the design of the Culturicon must be different with the background colour. Some users may use black as background colour, and some may use white. It is best to avoid using these two colours for the design od Culturicon.

Based on the analysis of the explanatory sequential mixed method, almost all principles are agreed by the designers and end users. There are only two principles that were not fully agreed by end user. So, the issue raised were considered and will be improved in future works.

274

6.5 Chapter Summary

This chapter discussed on the process of model validation by end users and presented the findings of the model validation. The validation by end user possesses the qualitative data collection and analysis process of the explanatory sequential mixed method.

Two validation phases for end users were performed in this study, namely (1) distributed collective interaction (where the participants were required to use the samples of Culturicon via CMC) and (2) focus group discussion (where the participants were invited to discuss their experience of using the Culturicon in the first phase).

Out of 45 samples of Culturicon, the first phase revealed that the frequency of Culturicon usage among the participants from the group of teenagers was 105. The analysis of the interaction also showed that these teenagers are imaginative and creative in using the samples of Culturicon. They can use the Culturicon in other perspectives, aside from its true meaning.

Meanwhile, the obtained findings of the second phase proved that all criteria of HCI icon design principles were fulfilled. Only several issues and suggestions were raised for criteria under the attractive, differ, and legible principles. All these issues were taken into consideration and modified accordingly. The obtained findings clearly showed that the analysis of Und-Meaning, Fml-Familiar, Leg-Recognise, Mem-Remember, Coh-Sort, Dis-Differ, Dis-Cue, and Inf-Suggestion codes achieved the first specific objective of focus group discussion.

The obtained findings also showed that the second specific objective was addressed through the analysis of Fml-Closer, Inf-Meaningful, Inf-Important, and Ind-Impact codes. The third specific objective was achieved through the analysis of Att-Design and Att-Attract codes. Lastly, the fourth specific objective was achieved through the analysis of Inf-Reflect, Und-Understanding, and Und-Adapt codes.

Following the analysis of the qualitative data, the explanatory sequential mixed method was used to analyse both quantitative (validation by designer) and qualitative (validation by end user) data on the HCI icon principles. The results of the interpretation revealed that all of the HCI icon principles were agreed upon by designers and end users. Only two principles have slight issues from the end user, which will be considered in future works.

With the achievement of the objectives of focus group discussion, the fourth objective of this study on the validation of the CDM through focus group was achieved.

CHAPTER SEVEN
DISCUSSION, RECOMMENDATIONS AND CONCLUSION

7.0 Introduction

This chapter concluded the overall study by explaining the obtained findings in-depth. The findings of the study are explored with respect to the objectives of the study. Besides that, this chapter also includes contributions of study, limitations of study, and recommendations for future research. Finally, the conclusion of the study is presented in this chapter.

7.1 Discussion of Findings

This section reviews and recapitulates the obtained findings of this study with respect to the objectives. Based on the findings of this study, it is discovered that using the CDM makes the development of Culturicon easy and accurate. This is due to the fact that CDM includes the appropriate level of cultural dimension for the intended country, which in this study is Asian countries. The traits that reflect the cultural dimensions can be identified by having the correct cultural dimensions, making it easier for the designer to get an idea for the culture element for the Culturicon.

Furthermore, when the Culturicon that possess the accurate culture element for the intended user were developed, it will be informative and useful for the end user to use in CMC. When the end user can find the Culturicon that best expresses their cultural expression rather than using an incorrect emoticon, it can help to reduce the level of message misunderstanding. Besides that, the developed Culturicon are proved to be attractive as end user demanded for more Culturicon to be developed.

Next section discusses on the finding for each research objective. The main objective of this study was to develop a culture-based emoticon design model for distributed collective interaction in the mobile messaging application. In order to achieve this main objective, four specific objectives were proposed.

7.1.1 Objective 1: To Identify the Appropriate Principles in Designing Emoticon

With respect to the first objective, this study addressed the following research question: "*What are the appropriate principles in designing emoticons?*". CLR and questionnaire survey were employed to achieve this objective. CLR was conducted to gather key findings of previous studies on emoticon, emoji, and sticker. Meanwhile, the questionnaire survey was performed to gather public feedback on the demand for culture-based emoticons, denoted as the Culturicon in this study.

CLR in this study was adapted from SLR by Kitchenham (2004). In relation with the rationalisation of doing SLR, as previously discussed in Section 3.3, CLR was employed to review existing evidence concerning the technology used in this study, specifically emoticon. It was also employed to identify the gaps in literature regarding emoticon, where the area of culture in emoticon was found lacking. Studies from journals and papers to technical reports in English on the search string of emoticon and CMC were gathered for review.

Result from CLR reported that studies that focus on the field of culture in relation to the use of emoticons have remained lacking. Among the reason why it is lacking is because the element of culture itself is really difficult to be recognised and classified (Dhaundiyal et al., 2020). The thought, behaviors, and actions based on the culture is

278

subjective and deep that it cannot be measured only by objective and quantitative data alone.

In understanding the culture, it needs to start from the theoretical aspects, which in this study investigate the culture models (Hall culture model, Trompenaars & Hampden Turner culture model, and Hofstede culture model). Based on culture models, the appropriate cultural dimensions were identified in order to gain a better understanding of the targeted countries' cultural thoughts, behaviours, and actions. Furthermore, there are categories under the cultural dimensions that categorise the criteria that reflect the level of the cultural dimensions. This study has done extensive research on culture models in order to gain sufficient information about culture to be included in the HCI study.

In order to reinforce evidence from the CLR, questionnaire survey was conducted. The CLR provided evidence from previous studies for this study, while the results of questionnaire survey provide evidenced from the public as the end users. The questionnaire survey was conducted to investigate the need for cultural-based emoticons in CMC among Malaysians by obtaining feedback on the usage of emoticons and need for cultural-based emoticons in their daily use of CMC.

Since Malay participants were chosen as the target respondents for this study, the questionnaire survey was conducted in Malay language. The questionnaire survey, which involved a total of 50 participants, was conducted at Universiti Utara Malaysia (UUM). The survey responses for the question of "*Do you think that the current emoticons available are sufficient enough to express your feelings, actions, and*

279

reactions during the online conversations?" recorded 4.02 of mean result, which was within the range of disagree.

Meanwhile, the survey responses the question of "*Do you agree that the current emoticons available are lacking in terms of Malaysia's culture?*" recorded 6.02 of mean result, which was within the range of agree. These survey results indicated the inadequacy of the current emoticons available to express users' purpose in relation to the element of culture from the viewpoints of these participants. This served as evidence as to why the current study on the principles in designing emoticons was necessary and significant.

Based on lack of studies gathered from CLR and the demand for more cultural-based emoticon from questionnaire survey, literature search was conducted to obtain the principles in designing emoticon. Several principles proposed by prior studies were reviewed to identify the appropriate principles to design emoticons in this study. A total of 12 principles were identified but only 11 principles were selected for this study after a thorough review. The following principles were used to develop the CDM: familiar, understandable, attractive, coherent, informative, distinct, unambiguous, memorable, compact, legible, and extensible. The justifications for these selected principles are described in Section 4.2.2. With the identification of these principles, the first objective of this study was achieved.

7.1.2 Objective 2: To Identify the Appropriate Cultural Dimensions in Designing Emoticons

With respect to the second objective, this study addressed the following research question: "*What are the appropriate cultural dimensions in designing culture-based*

emoticons?". In order to identify the appropriate cultural dimensions as the components of CDM for this study, prior studies on culture models were reviewed. Hall culture model (Hall, 1959), Trompenaars and Hampden-Turner culture model (Trompenaars & Hampden-Turner, 1997), and Hofstede culture model (Hofstede, 2011) were used in studies on HCI. Thus, these models were investigated for this study to gather information on the appropriate cultural dimensions for the design and development of CDM.

Following the completion of review, it was discovered that each model consists of its own dimensions. For instance, Hall culture model consists of 10 dimensions: (i) interaction, (ii) association, (iii) subsistence, (iv) bisexuality, (v) territoriality, (vi) temporality, (vii) learning, (viii) play, (ix) defence, and (x) exploitation. Meanwhile, Trompenaars and Hampden-Turner culture model consists of seven dimensions: (i) universalism-particularism, (ii) individualism-communitarianism, (iii) neutral-emotional, (iv) specific-diffuse, (v) achievement-ascription, (vi) sequential-synchronic relation to time, and (vii) internal-external attitude towards nature. On the other hand, Hofstede culture model consists of six dimensions: (i) power distance, (ii) uncertainty avoidance, (iii) individualism versus collectivism, (iv) masculinity versus femininity, (v) long-term versus short-term orientation, and (vi) indulgence versus restraint. Section 2.1.2 presents the definitions of these dimensions.

Based on the review of these culture models, similar classifications of dimensions were found across these three models. This suggests that there are certain dimensions in these three models that are classified similarly. Similar classifications of dimensions

281

are possession in society, relationship between people, importance of time, reaction to law, and difference in gender.

The classification of *possession in society* means how culture can be used to show the power of an individual or group in a society. The territoriality dimension (Hall culture model), achievement-ascription dimension (Trompenaars and Hampden-Turner culture model), and power distance dimension (Hofstede culture model) belong to this classification.

The classification of relationship between people means how the culture is used to define an individual or a larger group in a society. For this classification, there are dimensions of association (Hall culture model), individualism-communitarianism *(*Trompenaars and Hampden-Turner culture model), and individualism versus collectivism (Hofstede culture model).

The classification of importance of time is based on how culture is used to deal with time. This classification consists of dimensions of *temporality* (Hall culture model), sequential-synchronic relation to time (Trompenaars and Hampden-Turner culture model), and long-term versus short-term orientation (Hofstede culture model).

Meanwhile, the classification of reaction to law denotes how culture responds to law for an individual or community. In this classification, there are dimensions of defence (Hall culture model), universalism-particularism (Trompenaars and Hampden-Turner culture model), and uncertainty avoidance (Hofstede culture model).

The final classification is the difference in gender. This classification refers to the distribution of values between genders, which is considered to be a core issue in

282

society. This classification consists of dimensions from two models only, which are bisexuality (Hall culture model) and masculinity versus femininity (Hofstede culture model).

Following the identification and classification of these dimensions, the study proceeded to selecting the appropriate cultural dimensions for the design and development of the model. Based on the review, the dimensions of Hofstede culture model were chosen given its popularity and widely used in cross cultural study as compared to the other two models (Abubakari et al., 2018; Dhaundiyal et al., 2020). Hofstede's cultural dimensions are widely used because he studied 74 countries and the scores assigned to each are reliable that convinced many interface researcher to apply Hofstede culture model in their studies (Ishak & Jaafar, 2016).

In addition, Hofstede culture model is an updated version of the Hall culture model, where Hall previously suggested for a model that is more useful and applicable to individuals that are not within the field of anthropology to be developed. The simplicity of the model itself is another explanation for its success. Therefore, the application of the Hofstede culture model is deemed relevant to HCI research.

Based on these justifications, the chosen dimensions from the Hofstede culture model for the current study included the following: (i) high power distance, (ii) high collectivism, (iii) low uncertainty avoidance, (iv) moderate masculinity/femininity, and (v) long-term relationship. The level provided for each dimension was based on the level suggested by previous studies that similarly focused on Asian countries (Gould et al., 2000; Hofstede, 2011; Karreman & Romeo, 2016; Miehle et al., 2016;

Heimgärtner, 2017). With the identification of appropriate cultural dimensions for the CDM, the second objective of this study was achieved.

7.1.3 Objective 3: To Design and Develop Culturicon Design Model for Designing the Culturicon

With respect to the third objective, this study addressed the following research question: "*How to design and develop the appropriate Culturicon Design Model?*". Following the identification of the appropriate cultural dimensions and HCI icon design principles, the study proceeded to the next step, which was to design a model based on the components of the selected cultural dimensions and HCI icon design principles and develop a culture-based emoticon design model, denoted as the Culturicon Design Model or CDM. The term "Culturicon", which is the combination of "culture' and "icon", means that the icon containing the element of culture as a representation in communication via CMC.

For the design of CDM, a step from design thinking method by Nielsen was adapted. The design thinking method by Nielsen consists of (i) understand (empathise and define), (ii) explore (ideate and prototype), and (iii) materialise (test and implement) that comprises six distinct steps between these three methods.

For this study, the ideate step was applied, where the ideas on how to sketch and develop the model were brainstormed. The design of the model ensures that the users and designer understand the flow of the model and how to use the model. Several sketches were designed and discussed in order to create the best version of the CDM in this study.

In designing the model, the five cultural dimensions along with its categories and traits need to be grouped accordingly in addition to the eleven HCI icon design principles and its criteria. Besides that, the phases of the model must also be explicitly indicated so that users can easily comprehend the flow of the model.

After completed all these steps, the draft design of the model was developed. The model consists of two phases, which involved cultural dimensions and HCI icon design principles. In the first phase, users were required to select either one or more cultural dimensions. There were categories that consisted of several traits for users to choose from under the cultural dimensions. Users can choose these traits as the main elements of the Culturicon before they can proceed to the second phase.

In the second phase, they were required to fulfil all HCI icon design principles to ensure the applicability and usefulness of the developed Culturicon for the end users in real-world environment. This draft design was then subjected to verification before the final design can be developed. The verification method was used to ensure that the study implemented the processes and approaches right in developing the model.

For the verification method, expert review was considered because this approach is quick, inexpensive, and intuitive (Nielsen & Molich, 1990; Korhonen, 2010). This approach can also be used to identify major problems regarding the proposed model and to check how well the model meets the requirements (Nielsen & Molich, 1990). In conducting expert review for verification, convergent parallel mixed method design was applied. This is because, this study collected both quantitative and qualitative data concurrently. Then the analysis of data was conducted separately before the overall results were merged and compared to improve and revise the draft model.

285

The developed draft of the model was verified by experts in their respective domain to ensure that the model meets the requirements before the development of the final design. As the components of the model were of cultural dimensions and HCI icon design principles, experts in the domains of HCI, UX, culture, arts and design were required to verify the model. The verification of the model in this study involved four HCI experts, two culture experts, two arts and design experts, two designers, and one industry practitioner. The total number of selected experts for the verification of the model was 11, exceeding the suggested total number of experts needed (Nielsen & Molich, 1990). In addition, these chosen experts fulfilled the minimum requirements of an expert, as discussed in Section 3.5.1.

Once the experts indicated their agreement to participate, an e-mail containing model verification form, draft of the model, and link to the questionnaire, was sent to each expert. These experts were also encouraged to have a F2F meeting if further explanation was needed. Two experts requested to have a F2F meeting.

The questionnaire consisted of three parts of model verification. The first part involved the verification of the overall model, which was followed by the verification of cultural dimensions and finally, the verification of HCI icon design principles. For the verification of the overall model, experts were required to verify the relevance of the cultural dimensions and HCI icon design principles based on the following choices: (1) all proposed components are relevant; (2) some components may not be relevant; (3) all components are not relevant. The same set of verification document was used for both quantitative method and qualitative method, only that for qualitative method was conducted in semi-structured interview.

Both verifications were conducted concurrently. Following the completion of data collection, data from both methods were merged and compared. In comparing both data, the side-by-side approach was implemented. The detail results were presented in Section 4.4. Based on these comparing results, amendments were needed to improve the model. The amendments are: 1) Changed the layout of the model, from circular shape to flow shape; 2) Modified the category and trait within the cultural dimensions; and 3) Modified the HCI icon principles. The details of the revised CDM were discussed in Section 4.5.

The expert review's feedback is critical for developing the right model. Initially, the proposed model was developed based on previous studies' suggestions, which may have included components that were not appropriate to include. The right component to include becomes much clearer after having experts review the model. The revised model, which is based on expert reviews, is deemed to be much more relevant, particularly because the model focuses on Asian countries. With the development of revised CDM based on the verification method through expert review, the third objective was achieved.

7.1.4 Objective 4: To Validate the Culturicon Design Model Through Focus Group

With respect to the fourth objective, this study addressed the following research question: "*How to ensure the validity of the Culturicon Design Model?*". Validation method of the CDM was involved at this point. The validation method was used to ensure that the study implemented the right processes and approaches.

After the model was verified by experts, the next step was to validate the model. This study incorporated two parts of model validation. The first part involved model validation by designers (the primary users of CDM). The second part involved model validation by end users—these are the users of Culturicon (product of CDM) in the real-world communication via CMC.

For the first part, five designers were chosen to validate the model. Three designers from the industry and two freelance designers participated in this study for the model validation. All of them possess experience of more than five years in graphic design, which satisfied the requirement by Nielsen and Molich (1990). These designers were required to go through the model first and then designed samples of Culturicon based on the model. As described in the model, they were required to select one or multiple cultural dimensions as well as the core elements of the Culturicon. Apart from the cultural dimensions, the design of the Culturicon must fulfilled all eight HCI icon design principles. The participating designers were encouraged to design samples of Culturicon based on all five cultural. Once they completed the design samples of Culturicon, they were required to validate the model based on their experience of using the model. A validation form was provided to each designer.

The validation process involved three parts: (1) cultural dimensions; (2) HCI icon design principles; (3) overall model. For the validation of cultural dimensions, all traits scored 60% and above. Most of the traits scored 80% and 100%, except for the following: M: Emphasis on money and things; F: Emphasis on quality of life and people (40%); M: Failing is seen as disaster; F: Failing is seen as minor accident (20%). Both traits are under the moderate masculinity/femininity dimension. It is

understandable that these traits scored lower than 60% because they may not be appropriate for Asian countries, particularly Malaysia, given that the designers were all Malaysians. Though these traits were gathered by Hofstede (2011), not all Asian countries possess that same traits. So, as the result, these traits will be removed in future work.

Meanwhile, the validation of HCI icon design principles, all criteria scored 100%. All designers agreed on the inclusion of all criteria of HCI icon design principles for this model. The same results were obtained for the validation of the overall model, with all variables from the criteria of gain satisfaction, interface satisfaction, and task support satisfaction scoring 100%. This demonstrates to the designers that the overall model is understandable and readable.

After the study completed the model validation by designers, the model was validated by end users through focus group discussion. Focus group was chosen to validate the model because this cost-effective approach is an efficient way to collect a vast volume of knowledge as well as detailed viewpoints and suggestions from many participants within a short or limited timeframe (Hines, 2000; Krueger & Casey, 2000).

In this study, a group of teenagers were chosen as participant. This is because teenagers are reported to be the most mobile phone and Internet user according to data by Malaysian Communications and Multimedia Commission (2018). The number of teenagers are eight, as suggested by Creswell (2014).

The model validation by end users in this study was divided into two phases. The first phase involved distributed collective interaction via Telegram's group. The

participants were required to use the samples of Culturicon that were developed by the designers in the group conversations within a timeframe of one week. For the second phase, these participants were invited to participate in the focus group discussion to discuss their experience of using the samples of Culturicon. The discussions were recorded and transcribed. The transcripts were then analysed using ATLAS.ti (version 9).

A total of 17 questions were discussed during the focus group discussion, as listed in Table 6.2. Based on these questions, eight themes and 17 codes were constructed. These codes were presented in the form of network to show the relationships of the data gathered from the focus group discussion. The overall responses from the participants were found positive, and the criteria of all HCI icon design principles were fulfilled. With that, all four objectives of the focus group were achieved. Only minor issues and suggestions were highlighted for the criteria under the attractive, differ, and legible principles. The details of the code network analysis were discussed in Section 6.3.

The findings of focus group discussion involving teenagers demonstrated the applicability of the Culturicon for end users. It is found that teenagers are generally more inventive in their way of using Culturicon. Some of them used the Culturicon in ways that do not accurately reflect their true meaning, but still were used in a positive way. This helps them even more because the Culturicon can be used in a variety of ways for their communication. For example, the aeroplane Culturicon can be used to express that they are going somewhere even if they are not actually flying. The aeroplane Culturicon is actually developed to express the MAS aeroplane, as the

element from high power distance. This means that the usage and interpretation of the Culturicon can be varied, depending on the creativity of the user.

They also agreed that Culturicon is useful and meaningful to them during their conversations via CMC. Although some design improvements are required, Culturicon was well-received among the participants, calling for more design samples of Culturicon. The fact that these participants requested for more Culturicon to be designed reflect informative and attractiveness of the Culturicon. This proved that the HCI icon principles provided in the model are appropriate and relevant in designing Culturicon.

By following the HCI icon principles in the model, a good design of Culturicon can be developed. Though the design produced is dependent on designer's ability to sketch, but the model has provided the guidelines as a way to assist designer. With the completion of the validation of the CDM, the fourth and final objective was achieved.

7.2 Contributions of Study

This study presented several theoretical and empirical contributions, especially in the fields of HCI, culture, and icon design. The main contributions consisted of the CDM, design traits and criteria for cultural dimensions and HCI icon design principles, Culturicon design guidelines, as well as the theoretical and empirical findings. The following subsections elaborate the contributions of this study.

7.2.1 The Culturicon Design Model

The main contribution of this study is the development of Culturicon Design Model or CDM. The model was built on the basis of the theoretical results of CLR and the

291

requirements gathered from the end user. Based on these theoretical results, the study of emoticons in the field of culture was found to be lacking and the existing emoticon selection are limited and bias towards the cultures of developer's countries. The outcome of this study has overcome these flaws by the development of cultural-based emoticon design model that is known as CDM. CDM comprised of the five cultural dimensions and eight HCI icon design principles that can assists designer to develop Culturicons.

The primary user of CDM is the designer. The designer can use this model as the guideline to develop Culturicon. The developed Culturicon then can be added in the mobile messaging application to be used by end user. End user can use the Culturicon in their communication to help them to better express their intention relating to culture.

7.2.2 Design Traits and Criteria for Cultural Dimensions and HCI Icon Design Principles

This study constructed detailed design traits and criteria for cultural dimensions and HCI icon design principles, which were found lacking in the previous studies. For all five cultural dimensions and eight HCI icon design principles, this study discussed the traits and criteria in detail based on an extensive review of previous studies. The gathered traits and criteria were then verified by experts to ensure the appropriateness of the selected traits and criteria for the developed model.

The model included the level of cultural dimensions for Asian countries that were reported by prior studies. In addition, based on experts' suggestions and recommendations, the categories and traits under the cultural dimensions have been revised and updated to better represent the cultures of Asian countries as discussed in

292

Section 4.5. Once all traits and criteria were verified and validated, it is proven that these traits and criteria are appropriate and essential for the CDM to be used by designers to design Culturicon.

7.2.3 Guidelines for Designing the Culturicon

The CDM was developed as a guideline for users, specifically the designers, to design Culturicon based on the cultural dimensions and HCI icon design principles provided in the model. The inclusion of detailed traits of cultural dimensions allows users to have a better understanding on the cultural aspects for them to determine the key features of Culturicon.

Under the cultural dimensions, there are a total of 42 traits that have been categorized according to category. Users may choose either one or multiple traits to be the elements of Culturicon. Meanwhile, the inclusion of the criteria of HCI icon design principles assists users to design an accurate, effective, useful, and meaningful Culturicon.

With these cultural dimensions and HCI icon design principles as the main components of the CDM, it has become easier for designers to develop Culturicon and can encourage designers to design more samples of Culturicon.

7.2.4 Theoretical Findings

For theoretical study on culture model, Hall culture model, Trompenaars and Hampden-Turner culture model, and Hofstede culture model are among the culture models that have been extensively studied. Based on this, it is found that several cultural dimensions from these three culture models are similar and belong under same

293

category. It is also found that the Hofstede culture model is the most widely used compared to the other two models.

In addition, the level of cultural dimension for Asian countries were also gathered. Then, a number of HCI past studies, particularly icon design for mobile context and culture models, have been extensively examined and analysed in the development of the CDM. Many of the proposed approaches in previous studies in relation to HCI and culture were reviewed and analysed in this study to achieve the objectives.

This included HCI studies by Callahan (2005), Dormann (2006), and Gould et al. (2000), which applied specific culture models in their studies. Gould et al. (2000) applied the dimension of power distance and individualism-collectivism from Hofstede culture model along with the dimension of specific relationship from Trompenaars culture model in their study to compare representative's websites for Malaysia and United States.

Meanwhile, Callahan (2005) and Dormann (2006) applied Hofstede culture model to analysed university's websites from different countries. However, studies on the development of emoticon or emoji for culture's perspective have been lacking. There was no specific guideline for designers to design an emoticon or emoji for CMC. As a result, studies on icon development were studied, resulting in the formation and inclusion of HCI icon design principles for the CDM in this study. These culture models and findings of previous studies along with HCI icon design principles were used as guidance for the retrieval of the core components of the CDM.

7.2.5 Empirical Findings

This study developed CDM that consists of detailed traits and criteria for all selected cultural dimensions and HCI icon design principles. The accuracy and usefulness of the model were verified and validated. CLR and questionnaire survey were conducted to determine the requirements of the Culturicon in CMC. Evidently, based on the CLR, studies on emoticon from the cultural perspective have been lacking. In addition, the results of questionnaire survey demonstrated the need for culture-based emoticon to cater the demands of end users.

All components were presented in the forms of dimensions, principles, traits, and criteria. These components were verified by experts and validated by designers and end users (through focus group). The obtained findings of this study can serve as a guide for designers to develop more culture-based emoticons for users to use in conversations via CMC.

Overall, the usage of emoticons is crucial in the current mobile messaging application. These empirical results can be very helpful in generating new knowledge or expanding the present study and improvising the current study as this study only focus on the traits of cultural dimensions for Asian countries.

7.3 Recommendation on the Use of the Developed Model

The validated CDM can serve as a guideline for designers to develop and produce more samples of Culturicon that represent the element of culture for end users to use and enhance their cultural intention in conversations via mobile messaging

application. The samples of Culturicon that were designed and developed based on this model were found effective and useful for the participants.

Furthermore, after using Culturicon, most of the participants demanded for more samples of Culturicon. This reflects an opportunity for designers to develop more samples of Culturicon based on the developed model. Overall, the developed model is dynamic, where users can choose up to five cultural dimensions. These cultural dimensions also consist of 42 traits in detail, which can assist users to choose the appropriate traits of cultural dimensions for their projects. However, it should be noted that all criteria of HCI icon design principles must be fulfilled.

7.4 Limitations of Study and Recommendations for Future Research

This study encountered several limitations that need to be addressed in future research, which are as follows:

1) The developed CDM in this study focused on the Asian culture only. The levels for the selected cultural dimensions, such as high power distance and high collectivism, were determined based on the levels found across the Asian countries studied by Hofstede (2011). This selection was due to the focus of the current study on establishing Culturicon design guidelines based on the Asian culture. It is recommended for future research to expand the CDM to cover the culture of other regions.

2) Although the design and development of CDM was based on the Asian culture, the developed samples of Culturicon were based on the Malaysian culture only. The Malaysian culture was used in this study as the key basis of the design

samples of Culturicon. It is recommended for future research to use the CDM to design and develop samples of Culturicon based on the culture of other Asian countries.

3) The validation of the model by end users involved only teenager as participants. This selection was due to the report by Malaysian Communications and Multimedia Commission (2018) that reported teenagers are the most user who used the mobile phones and Internet. Therefore, it is recommended for future research to include participants from different age group to gather richer insights on the subject matter. In addition, an increase in the number of participants for the focus group is recommended.

7.5 Conclusion

The usage of emoticons, emoji, and stickers have become essential in mobile messaging applications. These emoticons, emoji, and stickers can converse users' emotion and intention—a single emoticon can replace several words. Hence, it is widely used in CMC. More pictorial icons are created for mobile messaging applications, but culture-based icons of some countries have remained lacking, especially for culture of countries other than the developer's countries. This has resulted to the limitation of available emoticon selection especially for users from various cultures even though there is a high demand for more emoticon development, particularly in cultural contexts.

Furthermore, users who are unfamiliar with the current emoticon can misinterpret and misunderstand the exact meaning of the emoticon due to the different culture interpretation. Focusing on this, a CLR was conducted in this study to review key

findings of previous studies regarding the usage of emoticon from the theoretical perspectives. Meanwhile, questionnaire survey was conducted among users to explore the need to create culture-based emoticons in the real world environment.

The CLR identified culture as the least-explored aspect, while the survey results demonstrated the lack of emoticon selection for the end users and the need to develop more culture-based emoticons. Thus, this study developed the CDM that consists of cultural dimensions and HCI icon design principles.

The developed CDM includes a total of five culture dimensions and 11 HCI icon design principles based on the review of literature. CDM was later verified by 11 experts from the fields of HCI, culture, arts, and design, including designers and industry practitioner. These chosen experts fulfilled the requirement by Nielsen and Molich (1990) for the expert review process.

Overall, the experts expressed favourable feedback on the developed model. Only minor amendments were required. Based on the expert feedback, amendments were made to the model, resulting in five cultural dimensions and eight HCI icon design principles for the final version of CDM.

The model was then validated by designers and end users (through focus group). In summary, the results of model validation by designers and end users demonstrated the applicability and usefulness of the CDM. This study proved that the developed CDM is useful and helpful for designers as a guide to develop samples of Culturicon that are also useful and helpful for end users in CMC.

End user participants agreed that the samples of Culturicon represent the culture elements and fulfilled all HCI icon design criteria though there are few issues and suggestion were raised during the focus group discussion. They also stated that the usage of Culturicon can make their communications via CMC become faster because a single picture can represent multiple words. This makes the process of writing, reading, and interpreting the content of the message becomes faster.

The participants also agreed that Culturicon may attract more users especially the adults to use CMC as Culturicon represent things that relate to their life. When adults are attracted to Culturicon, the number of adults who use CMC may increase.

Based on the results of model validation, the developed CDM, not only helps designers to develop Culturicon, but encourages them to develop more samples of Culturicon, as the CDM can facilitate their work. Moreover, there is a high demand for more Culturicon among the end users. Designers should take advantage of this opportunity to develop more Culturicon so that end users have a larger range of Culturicon to choose from, thus satisfying their needs for more Culturicon and making communication through CMC more effective.

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318

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APPENDIX

Appendix A

Selected Papers for Review and Analysis

Journals/ Conferences	Selected Articles
IEEE	(Cao & Ye, 2009), (Ptaszynski & Maciejewski, 2010), (Yamashita, Yamaguchi, & Takami, 2010), (Toratani & Hirayama, 2011), (Nayeem, Mukta, Ahmed, & Rahman, 2012), (Rojas, Kirschenmann, & Wolpers, 2012), (Soranaka & Matsushita, 2012), (Vogel & Sanchez, 2012), (Boia, Faltings, Musat, & Pu, 2013), (Huang, Han, Que & Wang, 2013), (Ito & Fujimoto, 2013), (Urabe, Rzepka, & Araki, 2013), (Urabe, Rafal, et al., 2013), (Solakidis, Vavliakis, & Mitkas, 2014), (Yokoi, Kobayashi & Ibrahim, 2015), (Schlichtkrull, 2015), (Wang & Castanon, 2015), (Hussien, Tashtoush, Al-Ayyoub, & Al-Kabi, 2016)
ACM	(Su & Yee, 2007), (Ganesan, Sundaresan, & Deo, 2008), (Derks et al., 2008), (Sahami Shirazi, Sarjanoja, Alt, Schmidt, & Hkkilä, 2010), (Ahn, Park, & Han, 2011), (Zhao, Dong, Wu, & Xu, 2012), (Bedrick, 2012), (Hogenboom et al., 2013), (Hu, Tang, Gao, & Liu, 2013), (Nakatsuma, 2013), (Nguyen & Fussell, 2013), (Zhang et al., 2013), (Chen et al., 2014), (Hautasaari, Yamashita, & Gao, 2014), (Yamamoto, 2014), (Lim, 2014), (Sasahara, 2014), (Kim & Lee, 2015), (Aydin Oktay, Balci, & Salah, 2015), (Lee, Oh, Hong, Lee, & Kim, 2016), (Liebman & Gergle, 2016)

Science Direct	(Derks et al., 2007b), (Derks et al., 2007a), (Tossell et al., 2012), (Itou, Motojin, & Munemori, 2013), (Mahajan & Mulay, 2015)
Web of Science	(Skovholt et al., 2014), (W. Wang, 2014)

Appendix B

Questionnaire Questions

Gender: Male / Female

Age: ☐15-25; ☐26-35; ☐36-45; ☐46 & above

Occupation: _____

1) Are you a smart phone user?
    a. Yes
    b. No

2) Which of the following device do you own?
    a. Android Phone
    b. IPhone
    c. Windows Phone
    d. Blackberry

3) Tick the online applications you use to have a conversation with other people.

☐ Facebook

☐ Twitter

☐ WhatsApp

☐ WeChat

☐ Telegram

☐ LINE

Others please specify

4) Do you use emoticons to express your feelings, actions and reactions during the online conversations?
    a. Yes
    b. No
5) What is the frequency of emoticons usage during the conversation?

a. Frequently use
b. Sometime
c. Rarely
d. Never

6) Do you think that the current emoticons available are sufficient enough to express your feelings, actions and reactions during the online conversations?
   a. Strongly agree
   b. Agree
   c. Disagree
   d. Strongly disagree

7) Do you agree that current emoticons available are lacking in term of Malaysia's cultures?
   a. Strongly agree
   b. Agree
   c. Disagree
   d. Strongly disagree

8) If new emoticons based on Malaysia's cultures are created for example Hari Raya celebration, national dress and traditional foods, do you think it will be useful?
   a. Strongly agree
   b. Agree
   c. Disagree
   d. Strongly disagree

9) Do you think by using the Malaysia's culture emoticons would help in introducing Malaysia's cultures worldwide?
   a. Strongly agree
   b. Agree
   c. Disagree
   d. Strongly disagree

10) Describe the emoticons you would like to have regarding Malaysia's cultures that does not exist yet. (if any)

Appendix C
Expert Request for Nomination Letter

Respective Prof/ Assoc Prof/ Dr,

I am Mohd Zhafri Bin Mohd Zukhi (900758), a PhD research scholar at School of Computing, Universiti Utara Malaysia. Currently, I am working on cultural-based emoticon model for distributed collective interaction in computer-mediated communication (Culturicon Design Model) as my PhD research.

As part of my research, I need your kind cooperation to be one of the experts to evaluate the proposed model. Your great opinion is important to make sure the model fulfils the requirements from the expert's point of view.

If you agree to participate and be the expert to review the proposed model, I will proceed and email the next step.

Your opinion and suggestion will help me to come up with a verified model. I would greatly appreciate your cooperation that may help me to complete my PhD research. If you have any inquiry or need further explanation regarding the model, do not hesitate to contact me (hp no: 012-4993269) or my supervisors Assoc Prof Dr. Azham Hussain (email: azham.h@uum.edu.my) and Assoc Prof Dr. Husniza Binti Husni (email: husniza@uum.edu.my).

Appendix D

Expert Review Cover Letter

Respective expert,

I am Mohd Zhafri Bin Mohd Zukhi (matric no: 900758), a PhD research scholar from School of Computing, Universiti Utara Malaysia. Currently, I am working on a Cultural-Based Emoticon Model (Culturicon Model) for distributed collective interaction via Computer-Mediated Communication for my PhD research. As one of the procedures in my PhD research, I would like to request your kind cooperation to be one of the experts to evaluate my proposed Culturicon Design Model. Your great opinion is important to make sure the model fulfill the requirements from the expert's point of view. Below is the link to a verification form of the proposed model.

https://goo.gl/forms/RU6fyQKmdo77uCLu2

Your opinion and suggestion will help me to come up with a verified model. Please write me back if you have questions or any explanations regarding the proposed model.

I would greatly appreciate your cooperation that may help me to complete my PhD research. If you have any other enquiry do not hesitate to contact me (hp no: 012-4993269) or my supervisor Assoc Prof Dr. Azham Hussain (email: azham.h@uum.edu.my) and Assoc Prof Dr. Husniza Husni (email: husniza@uum.edu.my).

Sincerely,

Mohd Zhafri Bin Mohd Zukhi

Appendix E

Expert Verification Documents

Conceptual Model of Cultural-Based Emoticon Design (Culturicon)

Dear Prof. / Dr. / Sir / Ma,

EXPERT REVIEW OF CONCEPTUAL MODEL OF CULTURICON DESIGN

I am **Mohd Zhafri Bin Mohd Zukhi** and currently pursuing PhD program in Information Technology at Universiti Utara Malaysia (UUM), Malaysia. I would like to inform that you have been selected to participate in this research on the reason as follows:

1. Your qualifications either in Human Computer Interaction (HCI) or Mobile Applications or Multimedia or Information Technology or Computer Science (CS) or any related areas for at least five year, and/or
2. Your qualifications in Cultural Studies for at least five years and/or
3. Your experience working for industry in graphic and design for at least five years.

My PhD research proposes a **CULTURAL-BASED EMOTICON DESIGN MODEL**. As part of this research, a conceptual design model which is named **Culturicon Design Model** has been designed. It is aimed to provide a conceptual design model of developing cultural-based emoticons to be used in Computer-Mediated Communication, especially in mobile messaging applications. The model developed are based from the dimension that suitable with Asian countries and culture as the intended user for this model is for the Asian people.

Therefore, as part of the prerequisite for this research, it is required that you evaluate the appropriateness of the proposed design strategies in the instrument listed in the review form via the link provided in the email.

It would be greatly appreciated if you could complete this evaluation form.

The information supplied will be treated as confidential and will be used for the research purposes, which will be reported anonymously in academic publications.

Please feel free to contact me by e-mail: **zhafrizukhi@gmail.com** in regard to any queries or my supervisor Assoc. Prof Dr. Azham Bin Hussain (azham.h@uum.edu.my) and Assoc. Prof Dr. Husniza Binti Husni (husniza@uum.edu.my).

INSTRUCTIONS:

Please read and go through the **Culturicon Design Model** figures provided below carefully. Once this is done, with the expertise you possess, please provide feedback for all questions in the review form via the link provided below or in the email.

Review Form Link: https://goo.gl/forms/KT2QSrtsvlSaQh6y2

CULTURICON DESIGN MODEL:

The model is intended to be used by the emoticon designer as the guideline to design and create cultural-based emoticon (Culturicon). There are 2 versions of model provided, which are the main version and the detail version. The main version is the simplified version of the model that contain the component of the model only, which are the dimensions of the cultural and the principles of Human Computer Interaction (HCI) icon. While in the detail version, there are detail information about these components.

As for the model itself, there are two phases involve in the **Culturicon Design Model**, which are the **Cultural Dimension Phase** and **HCI Icon Principle Phase**. The flow of the model is:

1. In the **Cultural Dimension Phase**, user can choose either one or many cultural dimensions to be considered in designing culturicon. The score of the cultural dimension in the model have been determined as the score of cultural dimensions for Asian countries (example: **High** power Distance, **High** Collectivism). After choosing the dimension, user can choose which trait of the dimension to design the culturicon. Each trait is provided with the criteria as guideline for user to follow. The meaning of the dimension use in this model are as below.

   Power Distance: The extent to which the less powerful members of organizations and institutions accept and expect that power as to be distributed unequally. In

high power distance, the decision making is centralized by the management and superiors who are highly respected.

Collectivism: How the individual in the society defines the person as part of a larger group. For high collectivism, individuals are strongly incorporated into groups of family that continue to protect them in exchange for loyalty.

Uncertainty Avoidance: The extent to which the members of the cultural programs cope with anxiety by minimizing uncertainty, either to feel comfortable or uncomfortable in unstructured situations. Low uncertainty avoidance is the willingness to take the risks and had more experimentation and innovative behavior.

Masculinity/Femininity: The distribution of values between the genders that is considers as fundamental issue in society.

Long-Term Relationship: The extent to which the society focuses on the future as opposed to the past and present. Long term orientation promotes virtues and persistence and focus towards future rewards.

2. After choosing the dimension(s), user need to fulfill all the HCI icon principles provided in the **HCI Icon Design Principle Phase** to design and create Culturicon

Culturicon Design Model for Asian Countries (Main Version)

331

CULTURAL DIMENSIONS

High Power Distance

- National → Express national building, ruler building and historical building and places
- Social Norm → Express privilege of authority & those in power
- Political → Express power of government & military
- Religion → Express the religion building, holy places
- Work → Express organization hierarchy / Express that each role has its place
- School → Express school hierarchy / Express that teacher & parent in command for teaching

High Collectivism

- National → Express traditional games & agriculture / Express the extended family & tribe / Express national outfit & culinary
- Political → Express that law depends on ruler or group
- Religion → Express polytheistic religion / Express celebrations, ceremonies & ritual
- Work → Fewer working hour / Hiring & promotion take in group status
- School → Learning in group / Student respect teacher

Low Uncertainty Avoidance

- Social Norm → Open to change & innovation / Tolerance for diversity
- Political → High interest in politic / Citizen protest are accepted / Fewer and general laws & regulations
- Religion → Many religions / Little persecution for belief / Each religion respect each other
- School → Open-ended learning
- Family → Fewer gender roles

Moderate Masculinity/Femininity

- Social Norm → M: Emphasis on money & things / F: Emphasis on quality of life & people / M: Live in order to work / F: Work in order to live / M: Ego oriented / F: Relationship oriented
- Political & Economic → M: Conflict solved through force / F: Conflict solved through negotiation / M: High priority for economic growth / F: High priority for environment protection
- Work → M: Prefer high pay / F: Prefer fewer working hour / M: Prefer fewer women in management / F: Prefer more women in management
- School → M: Failing is seen as disaster / F: Failing is seen as minor accident
- Family → M: Girls cry, boys cannot cry / F: Boys & girls can cry / M: Boys fight, girls cannot fight / F: Boys & girls cannot fight

Long-Term Relationship

- → Personal Adaptability is important
- → Design emphasis on persistent
- → Relationship are ordered by status

HCI ICON PRINCIPLES

Familiar
- User familiar the design
- Design are common in user's environment
- Applicable from real world knowledge

Understandable
- Spontaneously suggest the intended concept
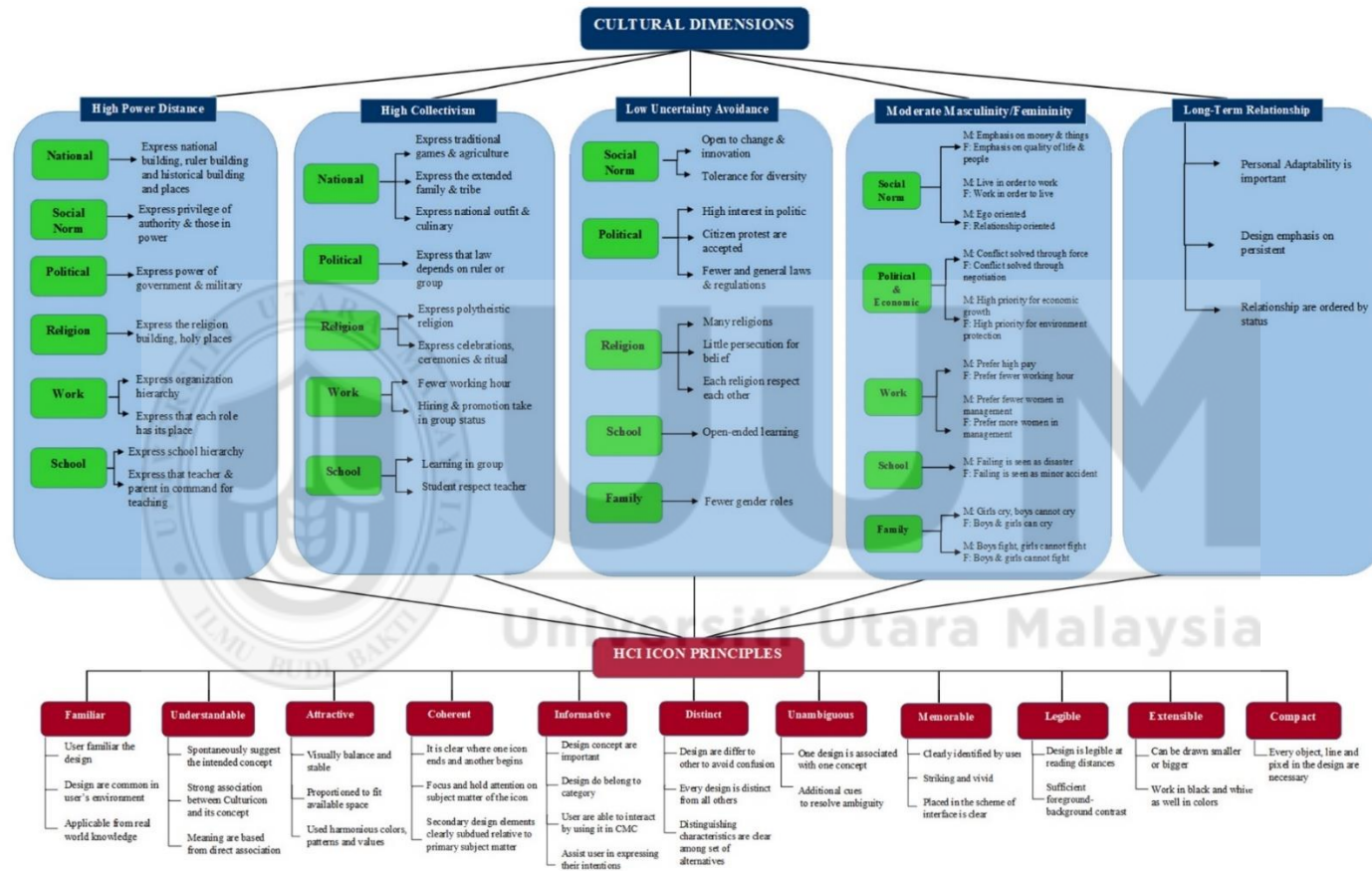- Strong association between Culturicon and its concept
- Meaning are based from direct association

Attractive
- Visually balance and stable
- Proportioned to fit available space
- Used harmonious colors, patterns and values

Coherent
- It is clear where one icon ends and another begins
- Focus and hold attention on subject matter of the icon
- Secondary design elements clearly subdued relative to primary subject matter

Informative
- Design concept are important
- Design do belong to category
- User are able to interact by using it in CMC
- Assist user in expressing their intentions

Distinct
- Design are differ to other to avoid confusion
- Every design is distinct from all others
- Distinguishing characteristics are clear among set of alternatives

Unambiguous
- One design is associated with one concept
- Additional cues to resolve ambiguity

Memorable
- Clearly identified by user
- Striking and vivid
- Placed in the scheme of interface is clear

Legible
- Design is legible at reading distances
- Sufficient foreground-background contrast

Extensible
- Can be drawn smaller or bigger
- Work in black and white as well in colors

Compact
- Every object, line and pixel in the design are necessary

Culturicon Design Model for Asian Countries (Detail Version)

332

Appendix F

Expert Verification Results

1. Background of Experts

Area	Expert (E)	Academic Qualification	Expertise	Current Position	Years of Experience
HCI	E1	PhD	Educational multimedia, persuasive multimedia learning environment, and user experience (UX)	Senior lecturer	10
	E2	PhD	User experience (UX) and virtual heritage	Senior lecturer	18
	E3	Master's degree	HCI, multimedia, and 3D Modelling and digital illustration	Lecturer	6
	E4	Master's degree	IT management and HCI	IT officer	9
Culture	E5	PhD	Arts and socio-culture	Lecturer	12
	E6	Master's degree	Arts and culture	Lecturer	10
Arts and Design	E7	PhD	User emotion and perception on design aesthetics	Senior lecturer	7
	E8	Master's degree	Fine arts department	Lecturer	8
Industrial Practitioner	E9	Bachelor's degree	System development	System developer	10
Designer	E10	Bachelor's degree	Graphic design	Graphic designer	7
	E11	Bachelor's degree	Industrial and graphic design	Graphic designer	5

2. Verification Results of Overall Model

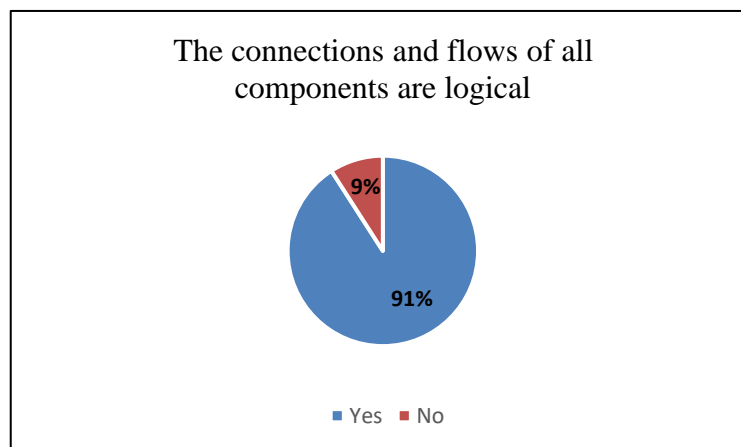| Parts	Frequency (n = 11)		
	All proposed components are relevant	Some components may not be relevant	All components are not relevant
Cultural Dimensions	7	4	-
HCI Icon Design Principles	9	2	-

3. Verification Results of Component in Cultural Dimensions

Components	Frequency (n = 11)		
	It is easy to understand	Need some explanation	Need very detail explanation
High power distance	9	2	-
High collectivism	6	5	-
Low uncertainty avoidance	6	4	1
Moderate masculinity/femininity	7	3	1
Long-term relationship	5	4	2

4. Verification Results of Component in HCI Icon Principles

Component	Frequency (n = 11)		
	It is easy to understand	Need some explanation	Need very detail explanation
Familiar	9	2	-
Understandable	9	2	-
Attractive	10	1	-
Coherent	6	5	-
Informative	10	1	-
Distinct	8	1	2
Unambiguous	8	1	2
Memorable	9	2	-
Legible	7	4	-
Extensible	9	1	1
Compact	10	1	-

5. Expert Feedback of Connections and Flows of the Overall Model.

The connections and flows of all components are logical

9%
91%

■ Yes ■ No

6. Expert Feedback of Model Readability

Overall, the proposed model is readable

9%

91%

■ Yes ■ No
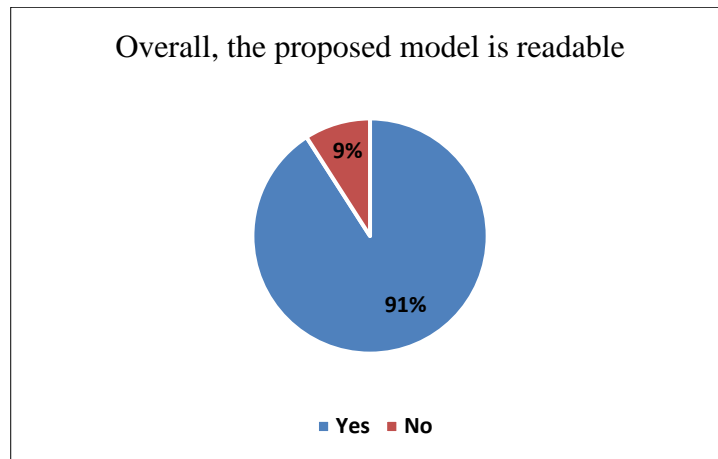
7. Comments and Suggestions from Experts

Element	Expert	Comments and Suggestions
Component	E1	There are too many components provided in the model. All these components are needed in developing the Culturicon? Need to enlarge the font size.
	E5	The scope of the culture is broad. The model needs to be more focused and precise towards the culture it wants to express.
	E11	Some components need explanation, as they are hard-to-understand and interpreted into graphical elements.
Connections and Flows of the Model	E1	Need to consider and identify the mandatory and optional components of the model. Provide simple operational design (OD) or legend for each component; provide relationships of components to show clear connection.
	E9	Should provide process flow.
Overall Model	E6	Overall are good and interesting.
	E7	At this stage, descriptions are explained in words, and it will be interesting when the designer begins to sketch the icons representing the culture. Agreed with the proposed model and will be interesting to see the findings.

Appendix G

Revised Version of Culturicon Design Model

1. Phase 1: Cultural Dimensions of Culturicon Design Model

PHASE 1: IDENTIFY CULTURAL ELEMENT		
Cultural Dimension	**Trait**	**Criteria**
High Power Distance	**National**	National building, ruler building, and historical building
	Social Norm	Privilege of authority and those in power
	Political	Power of royal institution and military (traditional/modern)
	Religion	Religion buildings and holy places
	Work	Government and organisational hierarchy (traditional/modern)
	Education	School hierarchy
	Family	Young people respect elderly.
High Collectivism	**National**	Traditional games and agriculture
		National outfit and culinary
	Social Norm	Obedient to customs and rules
		Value interpersonal harmony
	Political	Law depends on the ruler or group.
	Religion	Celebrations and ceremonies
	Work	Work in group and support each other
		Maintain harmonious environment
	Education	Learning in group
		Students respect teachers.
	Family	Extended family and tribe
Low Uncertainty Avoidance	**Social Norm**	Open to changes and innovation
		Tolerance for diversity
	Political	High interest in politics
		Government changes are accepted.
	Religion	Many religions
		Each religion respects one another.
	Work	Less loyalty
		At ease with changing jobs
	Education	Open-ended learning
	Family	Fewer gender roles
Moderate Masculinity/ Femininity	**Social Norm**	M: Emphasis on money and things
		F: Emphasis on quality of life and people
		M: High priority for economic growth
		F: High priority for environmental protection
		M: Ego-oriented
		F: Relationship-oriented
	Political	M: Solve conflict using force
		F: Solve conflict through negotiation
	Work	M: Prefer high pay

PHASE 1: IDENTIFY CULTURAL ELEMENT		
Cultural Dimension	**Trait**	**Criteria**
		F: Prefer shorter working hours
		M: Prefer fewer women in management
		F: Prefer more women in management
	Education	M: Failing is seen as disaster.
		F: Failing is seen as minor accident.
	Family	M: Girls can cry; boys cannot cry.
		F: Boys and girls can cry.
		M: Boys can fight; girls cannot fight.
		F: Boys and girls cannot fight.
Long-Term Relationship	**Social Norm**	Personal adaptability is important.
		Relationships are ordered by status.
	Work	Emphasis on persistence
		Less emphasis on leisure time
	Family	Be thrifty

2. Phase 2: HCI Icon Design Principles of the Culturicon Design Model

PHASE 2: DESIGN OF THE CULTURICON	
HCI Icon Design Principles	**Criteria**
Familiar	Users are familiar with the design.
	Design is common in the users' environment.
	Applicable from real-world knowledge
Understandable	Spontaneously suggest the intended concept
	Strong association between the Culturicon and its concept
	Meaning is based from direct association.
Attractive	Visually balanced and stable
	Proportioned to fit the available space
	Use harmonious colours, patterns, and values
Coherent	It is clear where one icon ends and another begins
	Focus and hold attention on the subject matter of the icon
	Secondary design elements are clearly subdued in relative to the primary subject matter.
Informative	Design concept is important.
	Design does belong to the category.
	Users are able to interact by using it in CMC.
	Assist users in expressing their intention
Distinct	Design is different from other designs to avoid confusion.
	Every design is distinct from other designs.
	Distinguishing characteristics are clear among the set of alternatives.

PHASE 2: DESIGN OF THE CULTURICON	
HCI Icon Design Principles	**Criteria**
Memorable	Clearly identified by users
	Striking and vivid
	Placed in the scheme of interface is clear
Legible	Design is legible at reading distances.
	Sufficient foreground-background contrast

Appendix H
Designer Request for Nomination Letter

Respective designer,

I am Mohd Zhafri Bin Mohd Zukhi (900758), a PhD research scholar at School of Computing, Universiti Utara Malaysia. Currently, I am working on cultural-based emoticon model for distributed collective interaction in computer-mediated communication (Culturicon Design Model) as my PhD research.

As part of my research, I need your kind cooperation to be one of the designer to evaluate the proposed model. Your great opinion is important to make sure the model fulfils the requirements from the designer's point of view.

If you agree to participate and be the designer to review the proposed model, I will proceed and email the next step.

Your opinion and suggestion will help me to come up with a validated model. I would greatly appreciate your cooperation that may help me to complete my PhD research. If you have any inquiry or need further explanation regarding the model, do not hesitate to contact me (hp no: 012-4993269) or my supervisors Assoc Prof Dr. Azham Hussain (email: azham.h@uum.edu.my) and Assoc Prof Dr. Husniza Binti Husni (email: husniza@uum.edu.my).

Sincerely,
Mohd Zhafri Bin Mohd Zukhi

CULTURAL-BASED EMOTICON DESIGN MODEL (CULTURICON)

Dear Prof. / Dr. / Sir / Ma,

DESIGNER VALIDATION FOR CULTURICON DESIGN MODEL

I am **Mohd Zhafri Bin Mohd Zukhi** and currently pursuing PhD program in Information Technology at Universiti Utara Malaysia (UUM), Malaysia. I would like to inform that you have been selected to participate in this research on the reason as follows:

1. Your experience working for industry in **graphic** and **design** for at least five years.

My PhD research proposes a **CULTURAL-BASED EMOTICON DESIGN MODEL**. As part of this research, a conceptual design model which is named **Culturicon Design Model** has been designed. It is aimed to provide a conceptual design model of developing cultural-based emoticons to be used in Computer-Mediated Communication, especially in mobile messaging applications. The model developed are based from the dimension that suitable with Asian countries and culture as the intended user for this model is for the Asian people.

The purpose of this validation is to examine the appropriateness and applicability of the Culturicon Design Model. Therefore, as part of the prerequisite for this research, it is required that you use the model by designing emoticons based from the Culturicon Design Model provided. The instructions on how to design the model are given below. After you finished designing the emoticons, please evaluate the appropriateness and applicability of the model's components by answering the questionnaire provided for the validation process. It would be greatly appreciated if you could complete this validation form.

The information supplied will be treated as confidential and will be used for the research purposes, which will be reported anonymously in academic publications.

Please feel free to contact me by e-mail: **zhafrizukhi@gmail.com** in regard to any queries or my supervisor Assoc. Prof Dr. Azham Bin Hussain (**azham.h@uum.edu.my**) and Dr. Husniza Binti Husni (**husniza@uum.edu.my**).

PART A: DESIGNER PROFILE

Name:	
Company Name:	
Mobile Phone: *	
Email:	
Year of experience:	

optional

PART B: CULTURICON DESIGN MODEL:

The model is intended to be used by the emoticon designer as the guideline to design and create cultural-based emoticon (Culturicon). There are 2 versions of model provided, which are the main version and the detail version. The main version is the simplified version of the model that contain the component of the model only, which are the dimensions of the cultural and the principles of Human Computer Interaction (HCI) icon. While in the detail version, there are detail information about these components.

As for the model itself, there are two phases involve in the **Culturicon Design Model**, which are the **Cultural Dimension Phase** and **HCI Icon Principle Phase**. The flow of the model is:

3. In the **Cultural Dimension Phase**, user can choose either one or many cultural dimensions to be considered in designing culturicon. The score of the cultural dimension in the model have been determined as the score of cultural dimension for Asian countries (example: **High** power Distance, **High** Collectivism). After choosing the dimension, user can choose which trait of the dimension to design the culturicon. Each trait are provided with the criteria as guideline for user to follow. The meaning of the dimension use in this model are as below.

Power Distance: The extent to which the less powerful members of organizations and institutions accept and expect that power as to be distributed

unequally. In **high power distance**, the decision making are centralized by the management and superiors who are highly respected

Collectivism: How the individual in the society defines the person as part of a larger group. For **high collectivism**, individuals are strongly incorporated into groups of family that continue to protect them in exchange for loyalty.

Uncertainty Avoidance: The extent to which the members of the cultural programs cope with anxiety by minimizing uncertainty, either to feel comfortable or uncomfortable in unstructured situations. **Low uncertainty avoidance** is the willingness to take the risks and had more experimentation and innovative behavior.

Moderate Masculinity/Femininity: The distribution of values between the genders that is considers as fundamental issue in society.

Long-Term Relationship: The extent to which the society focuses on the future as opposed to the past and present. **Long term orientation** promotes virtues and persistence and focus towards future rewards

4. After choosing the dimension(s), user need to fulfill all the HCI icon principles provided in the **HCI Icon Principle Phase** to design and create Culturicon.

INSTRUCTIONS:

1. Please read and go through the **Culturicon Design Model** figures provided carefully.

2. Please design at least ONE EMOTICON for ONE DIMENSION in the model. As there are FIVE DIMENSIONS, there should be minimum FIVE EMOTICONS to be designed.

PART C: VALIDATION FORM

The purpose of this validation is to ensure that the propose traits and criteria are appropriate from the perspective of the user, which is the designer. For cultural dimension phase, there are traits in each dimension and criteria to further explain the traits. While in HCI Icon Principle phase, there are criteria to further explain the principles. If user feel the criteria is appropriate and relevant, please answer agree and vice versa if do not agree.

1. **Validation on Cultural Dimension.**

a. High Power Distance Dimension

Traits	Criteria	Answer	
National	National building, ruler building and historical building	Agree	
		Disagree	
Social Norm	Privilege of authority and those in power.	Agree	
		Disagree	
Political	Power of royal institution and military (modern/traditional)	Agree	
		Disagree	
Religion	Religious building or holy places	Agree	
		Disagree	
Work	Government and organization hierarchy (modern/traditional)	Agree	
		Disagree	
Education	School hierarchy	Agree	
		Disagree	
Family	Young people respect elderly	Agree	
		Disagree	

b. High Collectivism Dimension

Traits	Criteria	Agree/Disagree	
National	Traditional games and agriculture	Agree	
		Disagree	

	National outfit and culinary	Agree	☐
		Disagree	☐
Social Norm	Obedient to custom and rule	Agree	☐
		Disagree	☐
	Value interpersonal harmony	Agree	☐
		Disagree	☐
Political	Law and depends on ruler or group	Agree	☐
		Disagree	☐
Religion	Celebrations and ceremonies	Agree	☐
		Disagree	☐
Work	Work in group and support each other	Agree	☐
		Disagree	☐
	Maintain harmony environment	Agree	☐
		Disagree	☐
Education	Learning in group	Agree	☐
		Disagree	☐
	Student respect teacher	Agree	☐
		Disagree	☐
Family	Extended family and tribe	Agree	☐
		Disagree	☐

c. Low Uncertainty Avoidance

Trait	Criteria	Answer	
Social Norm	Open to change and innovation	Agree	☐
		Disagree	☐
	Tolerance for diversity	Agree	☐
		Disagree	☐
Political	High interest in politic	Agree	☐
		Disagree	☐
	Government changes are accepted	Agree	☐
		Disagree	☐
Religion	Many religions	Agree	☐
		Disagree	☐
	Each religion respect each other.	Agree	☐
		Disagree	☐
Work	Less loyalty	Agree	☐
		Disagree	☐
	At ease with changing job	Agree	☐
		Disagree	☐
Education	Open-ended learning	Agree	☐
		Disagree	☐

346

Family	Fewer gender roles	Agree	
		Disagree	

d. Moderate Masculinity/Femininity

Trait	**Criteria**	**Answer**	
Social Norm	M: Emphasis on money & things. F: Emphasis on quality of life & people.	Agree Disagree	
	M: High priority for economic growth. F: High priority for environment protection.	Agree Disagree	
	M: Ego oriented. F: Relationship oriented	Agree Disagree	
Political	M: Conflict are solved through force. F: Conflict are solved through negotiation.	Agree Disagree	
Work	M: Prefer high pay. F: Prefer fewer working hour.	Agree Disagree	
	M: Prefer fewer women in management. F: Prefer more women in management.	Agree Disagree	
Education	M: Failing is seen as disaster. F: Failing is seen as minor accident.	Agree Disagree	

Family	M: Girl cry, boy cannot cry. F: Both girl and boy can cry.	Agree	
		Disagree	

e. Long-Term Relationship

Trait	Criteria	Answer	
Social Norm	Personal adaptability is important	Agree	
		Disagree	
	Relationships ordered by status	Agree	
		Disagree	
Work	Emphasis on persistence	Agree	
		Disagree	
	Leisure time not too important	Agree	
		Disagree	
Family	Be thrifty	Agree	
		Disagree	

2. Validation on HCI Icon Principle.

Principle	Criteria	Answer	
Familiar	User familiar the design.	Agree	☐
		Disagree	☐
	Design are common in user's environment.	Agree	☐
		Disagree	☐
	Applicable in real world.	Agree	☐
		Disagree	☐
Understandable	Spontaneously suggest the intended concept.	Agree	☐
		Disagree	☐
	String association between Culturicon and its concept.	Agree	☐
		Disagree	☐
	Meaning are based from direct association.	Agree	☐
		Disagree	☐
Attractive	Visually balance and stable.	Agree	☐
		Disagree	☐
	Proportioned to fit available space.	Agree	☐
		Disagree	☐
	Used harmonious colors, patterns and values.	Agree	☐
		Disagree	☐

Coherent	It is clear where one Culturicon ends and another begins.	Agree Disagree	☐ ☐
	Focus and hold attention on subject matter of the icon.	Agree Disagree	☐ ☐
	Secondary design elements clearly subdued relative to primary subject matter.	Agree Disagree	☐ ☐
Informative	Design concept are important.	Agree Disagree	☐ ☐
	Design do belong to a category.	Agree Disagree	☐ ☐
	User are able to interact by using it in CMC.	Agree Disagree	☐ ☐
	Assist user in expressing their intentions.	Agree Disagree	☐ ☐
Distinct	Design are differ to other to avoid confusion.	Agree Disagree	☐ ☐
	Every design is distinct from all others.	Agree Disagree	☐ ☐
	Distinguishing characteristics are clear	Agree Disagree	☐ ☐

	among set of alternatives.		
Memorable	Clearly identified by user.	Agree	
		Disagree	
	Striking and vivid.	Agree	
		Disagree	
	Placed in the scheme of interface is clear.	Agree	
		Disagree	
Legible	Design is legible at reading distance.	Agree	
		Disagree	
	Sufficient foreground-background contrast.	Agree	
		Disagree	

3. Overall Validation

Please validate and give comments on the below mentioned issues on the developed Culturicon Design Model implementation.

ISSUES	DESCRIPTIONS	COMMENT/SUGGESTIONS
Gain Satisfaction		
Relevancy to the intended application	The traits and criteria in the proposed model are applicable for application that used emoticon.	Agree ☐ Disagree ☐ Comments/Suggestions: ------------------------------------- ------------------------------------- -------------------------------------
Perceived usefulness	The proposed model is useful for the mobile application developers and emoticon designer, especially mobile messaging application.	Agree ☐ Disagree ☐ Comments/Suggestions: ------------------------------------- ------------------------------------- -------------------------------------
Clarity	The traits of the dimensions, the HCI icon principles and the flow of the model is clear for the model provided.	Agree ☐ Disagree ☐ Comments/Suggestions:

352

Interface Satisfaction		
Ease of use	The proposed model can be used easily on designing cultural-based emoticon.	Agree ☐ Disagree ☐ Comments/Suggestions: ------------------------------------ ------------------------------------ ------------------------------------
Organization	The proposed model is organized and structured well.	Agree ☐ Disagree ☐ Comments/Suggestions: ------------------------------------ ------------------------------------ ------------------------------------
Task Support Satisfaction		
Practicality	The proposed model is practical to be implemented in real-world development	Agree ☐ Disagree ☐

353

	environment of designing cultural-based emoticon.	Comments/Suggestions:

Completeness	The proposed model is adequate and suitable for designing the cultural-based emoticon.	Agree ☐ Disagree ☐ Comments/Suggestions: ----------------------------------- ----------------------------------- -----------------------------------
Understandability	The proposed model is understandable and readable.	Agree ☐ Disagree ☐ Comments/Suggestions: ----------------------------------- ----------------------------------- -----------------------------------
Ability to produce expected results	The proposed model enable to identify the cultural element in designing cultural-based emoticon to be	Agree ☐ Disagree ☐ Comments/Suggestions:

	used by the intended user.	------------------------------------
		------------------------------------

Overall Comments/Suggestions

_____

_____

_____

_____

Thank you for participating.

Appendix J

Designer Validation Results
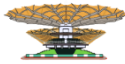
1. Profile of Designer

Designer (D)	Academic Qualification	Organisation	Years of Experience
D1	Bachelor's degree	Modenas	7 years
D2	Bachelor's degree	Modenas	6 years
D3	Diploma	NDesign Outline	6 years
D4	Bachelor's degree	Freelance	5 years
D5	Bachelor's degree	Freelance	5 years

2. Sample of Culturicon by Designer

Designer	Cultural Dimension	Culturicon	Name
Designer 1	High Power Distance		
			Rumah Panjang
			Gunung Kinabalu
			Menara Kuala Lumpur
			Stadium Bukit Jalil
			Malaysia Airlines
			Terengganu

356

Designer	Cultural Dimension	Culturicon	Name
	High Collectivism		Durian
			Satay
Designer 2	High Power Distance		KLCC
			Litar Sepang
			Langkawi
	High Collectivism		Membajak
			Mencangkul
			Menjala
			Mesin Padi
			Sawah Padi
			Traktor
			Nasi Lemak

Designer	Cultural Dimension	Culturicon	Name
Designer 3	High Power Distance		Istana Anak Bukit
	High Collectivism		Gasing
			Hari Raya
			Chinese New Year
			Deepavali 1
			Deepavali 2
			Ketupat
			Lemang
			Solat
			Solat Jemaah 1
			Solat Jemaah 2
			Solat Lelaki

Designer	Cultural Dimension	Culturicon	Name
			Solat Wanita 1
			Solat Wanita 2
Designer 4	High Power Distance		Putrajaya
	High Collectivism		Congkak
			Masyarakat Majmuk
Designer 5	High Collectivism		Wau Bulan
			Baju Melayu 1
			Baju Melayu 2
			Baju Kurung
	Low Uncertainty Avoidance		Perbincangan
			Menghormati agama lain
	Moderate Masculinity/Femininity		Lelaki Mementingkan Ekonomi

Designer	Cultural Dimension	Culturicon	Name
			Wanita Mementingkan Keharmonian Rumahtangga
	Long-Term Relationship		Menyesuaikan diri
			Perhubungan Mengikut Status

3. Results of Model Validation by Designers for Cultural Dimensions

Cultural Dimension	Trait	Criteria	D1	D2	D3	D4	D5	Percentage (%)
High Power Distance	National	National building, ruler building, and historical building	√	√	√	√	√	100
	Social Norm	Privilege of authority and those in power	√	√	√	√	√	100
	Political	Power of royal institution and military (modern/traditional)	√	*	√	√	√	80
	Religion	Religion buildings and holy places	√	√	√	√	√	100
	Work	Government and organisational hierarchy (modern/traditional)	√	√	*	√	√	80
	Education	School hierarchy	√	*	√	√	√	80
	Family	Young people respect elderly.	√	*	√	√	√	80
High Collectivism	National	Traditional games and agriculture	√	√	√	√	√	100
		National outfit and culinary	√	√	√	√	√	100
	Social Norm	Obedient to customs and rules	√	√	√	√	√	100
		Value interpersonal harmony	√	√	*	√	√	80

360

Cultural Dimension	Trait	Criteria	D1	D2	D3	D4	D5	Percentage (%)
	Political	Law depends on the ruler or group.	√	√	*	√	√	80
	Religion	Celebrations and ceremonies	√	*	√	√	√	80
	Work	Work in group and support each other	√	*	√	√	√	80
		Maintain harmonious environment	√	√	√	√	√	100
	Education	Learning in group	√	√	√	√	√	100
		Students respect teachers	√	√	√	√	√	100
	Family	Extended family and tribe	√	√	√	√	√	100
Low Uncertainty Avoidance	Social Norm	Open to changes and innovation	√	*	√	√	√	80
		Tolerance for diversity	√	√	√	√	√	100
	Political	High interest in politics	√	√	√	√	√	100
		Government changes are accepted.	√	*	√	√	√	80
	Religion	Many religions	√	√	√	√	√	100
		Each religion respects one another	√	√	√	√	√	100
	Work	Less loyalty	√	*	√	√	√	80
		At ease with changing jobs	√	√	*	√	√	80
	Education	Open-ended learning	√	*	√	√	√	80
	Family	Fewer gender roles	√	√	√	*	√	80
Moderate Masculinity/Femininity	Social Norm	M: Emphasis on money and things / F: Emphasis on quality of life and people	√	*	*	√	*	40
		M: High priority for economic growth / F: High priority for environmental protection	√	*	√	√	√	80
		M: Ego-oriented / F: Relationship-oriented	√	√	*	√	√	80
	Political	M: Solve conflicts using force / F: Solve conflicts through negotiation	√	*	√	√	√	80

361

Cultural Dimension	Trait	Criteria	D1	D2	D3	D4	D5	Percentage (%)
	Work	M: Prefer high pay F: Prefer shorter working hours	√	√	√	√	√	100
		M: Prefer fewer women in management F: Prefer more women in management	√	√	√	√	√	100
	Education	M: Failing is seen as disaster. F: Failing is seen as minor accident.	*	*	*	√	*	20
	Family	M: Girls can cry; boys cannot cry F: Boys and girls can cry.	√	√	*	√	√	80
Long-Term relationship	Social Norm	Personal adaptability is important	√	√	√	√	√	100
		Relationships are ordered by status.	*	√	√	√	√	80
	Work	Emphasis on persistence	√	√	√	√	√	100
		Less emphasis on leisure time	*	*	√	√	√	60
	Family	Be thrifty	√	√	*	√	√	80

Notes: √ denotes agree; * denotes disagree.

4. Results of Model Validation by Designers for HCI Icon Design Principle

Principle	Criteria	D1	D2	D3	D4	D5	Percentage (%)
Familiar	Users are familiar with the design.	√	√	√	√	√	100
	Design is common in the users' environment.	√	√	√	√	√	100
	Applicable in real-world knowledge	√	√	√	√	√	100
Understandable	Spontaneously suggest the intended concept	√	√	√	√	√	100
	Strong association between the Culturicon and its concept	√	√	√	√	√	100

Principle	Criteria	D1	D2	D3	D4	D5	Percentage (%)
	Meaning is based from direct association.	√	√	√	√	√	100
Attractive	Visually balanced and stable	√	√	√	√	√	100
	Proportioned to fit the available space	√	√	√	√	√	100
	Use harmonious colours, patterns, and values	√	√	√	√	√	100
Coherent	It is clear where one icon ends and another begins	√	√	√	√	√	100
	Focus and hold attention on the subject matter of the icon	√	√	√	√	√	100
	Secondary design elements are clearly subdued in relative to the primary subject matter.	√	√	√	√	√	100
Informative	Design concept is important.	√	√	√	√	√	100
	Design does belong to the category.	√	√	√	√	√	100
	Users are able to interact by using it in CMC.	√	√	√	√	√	100
	Assist users in expressing their intention	√	√	√	√	√	100
Distinct	Design is different from other designs to avoid confusion.	√	√	√	√	√	100
	Distinguishing characteristics are clear among the set of alternatives	√	√	√	√	√	100
Memorable	Clearly identified by users	√	√	√	√	√	100
	Striking and vivid	√	√	√	√	√	100
	Placed in the scheme of interface is clear	√	√	√	√	√	100
Legible	Design is legible at reading distances.	√	√	√	√	√	100
	Sufficient foreground-background contrast	√	√	√	√	√	100

Notes: √ denotes agree; * denotes disagree.

5. Results of Overall Model Validation by Designers

Criteria	Variable	D1	D2	D3	D4	D5	Percentage (%)
Gain satisfaction	Relevancy to the intended application	√	√	√	√	√	100
	Perceived usefulness	√	√	√	√	√	100
	Clarity	√	√	√	√	√	100
Interface Satisfaction	Ease of use	√	√	√	√	√	100
	Organisation	√	√	√	√	√	100
Task support satisfaction	Practicality	√	√	√	√	√	100
	Completeness	√	√	√	√	√	100
	Understandability	√	√	√	√	√	100
	Ability to produce expected result	√	√	√	√	√	100

Notes: √ denotes agree; * denotes disagree.

6. Overall Comments and Suggestions from Designers

Designer	Comments/Suggestions
D1	This model is helpful especially when it comes to narrow down the scope of culture to be designed. However, culture dimension of long-term relationship is quite difficult to be designed in the form of Culturicon. Maybe can update the criteria to make it easier to be interpreted by designer.
D2	In my opinion, this study is so inline and compatible with current need. This is because in this modern era, everything needs to be fast and easy to be understood. By having this Culturicon Design Model, I believe all the criteria such as cultural dimension etc. will be easily understood globally. I am also hope that this study will be continue for further study that cover more aspect in the future.
D4	This model provides systematic flow/process for designer to design effective Culturicon by following all the dimensions and principles in the model. Using this model can help designer to create more Malaysian culture emoticon. For future work, this study can expand the dimension that also cover other regions.
D5	This model is quite interesting. Only that some term is a little bit hard to be understood. Maybe can use more user-friendly term.

Appendix K

Frequencies of the Usage of Samples of Culturicon

No.	Culturicon	Fre (T)	Num.	Culturicon	Fre (T)
1		7	24		0
2		1	25		2
3		1	26		1
4		2	27		0
5		0	28		15
6		1	29		4
7		0	30		3
8		1	31		1
9		3	32		2
10		10	33		2
11		4	34		3

12		4		35		2
13		2		36		0
14		2		37		2
15		0		38		1
16		1		39		4
17		1		40		2
18		2		41		0
19		3		42		2
20		0		43		1
21		1		44		4
22		4		45		2
23		2				

Notes: Fre (T) denotes Frequency for Teenager;

CULTURAL-BASED EMOTICON DESIGN MODEL (CULTURICON)

Dear Prof. / Dr. / Sir / Madam,

FOCUS GROUP DISCUSSION

I am **Mohd Zhafri Bin Mohd Zukhi** and currently pursuing PhD program in Information Technology at Universiti Utara Malaysia (UUM), Malaysia. My PhD research proposes a **CULTURAL-BASED EMOTICON DESIGN MODEL**. As part of this research, a conceptual design model which is named **Culturicon Design Model** has been designed. It is aimed to provide a conceptual design model of developing cultural-based emoticons to be used in Computer-Mediated Communication, especially in mobile messaging applications. The model developed are based on the dimensions that suit with Asian countries and culture as the intended user for this model is the Asian people. However, this study focuses on Malaysia's culture.

As part of the research, the sample of the Culturicon created by designer were used by participant in Telegram via computer-mediated communication in the given time frame. After the time frame has finished, participants are gathered to perform a focus group discussion. The focus group will be performed to discuss on the usage of Culturicon with all participants. The discussion session will be videotaped for the purpose of research data analysis. All the information provided, and pictures taken will be treated with confidentiality for the research purposes, which will be reported anonymously in academic publications. If raises the need to publish the pictures, faces will be blurred to ensure the privacy are protected.

Please feel free to contact me by e-mail: **zhafrizukhi@gmail.com** in regard to any queries or my supervisors Assoc. Prof. Dr. Azham Bin Hussain (**azham.h@uum.edu.my**) and Assoc. Prof. Dr. Husniza Binti Husni (**husniza@uum.edu.my**).

PART A: PARTICIPANT PROFILE

Name:	
Age (year):	16–19 [ ] 20-29 [ ] 30-39 [ ] 40-49 [ ] 50-59 [ ]
Profession:	Student [ ] Worker [ ]
Institution:	
Mobile Phone: *	
Email:	

PART B: OBJECTIVE OF THE FOCUS GROUP

1. To investigate whether user is able to understand the meaning of the Culturion.
2. To investigate whether the Culturicon is useful and helpful to user when they use it in Computer-Mediated Communication.
3. To investigate whether the Culturicon is able to attract user to use technology especially the adults.
4. To investigate whether Culturicon is able to assist someone to understand and adapt to other culture.

PART C: CULTURICON DESIGN MODEL

The model is intended to be used by the emoticon designer as the guideline to design and create cultural-based emoticon (Culturicon). There are 2 versions of the model provided, which are the main version and the detail version. The main version is the simplified version of the model that contains the component of the model only, which are the dimensions of the cultural model and the principles of Human Computer Interaction (HCI) icon. While in the detail version, the detail information about these components are presented.

As for the model itself, there are two phases involve in the **Culturicon Design Model**, which are the **Cultural Dimension Phase** and **HCI Icon Principle Phase**. The flow of the model includes:

1. In the **Cultural Dimension Phase**, user can choose either one or many cultural dimensions to be considered in designing Culturicon. The score of the cultural dimension in the model have been determined as the score of cultural dimensions for Asian countries (example: **High** power Distance, **High** Collectivism). After choosing the dimension, user can choose which trait of the dimension to design the Culturicon.

369

Each trait is provided with the criteria as guideline for user to follow. The meaning of the dimension use in this model are as follows.

Power Distance: The extent to which the less powerful members of organizations and institutions accept and expect that power as to be distributed unequally. In **high power distance**, the decision making is centralized by the management and superiors who are highly respected

Collectivism: How the individual in the society defines the person as part of a larger group. For **high collectivism**, individuals are strongly incorporated into groups of family that continue to protect them in exchange for loyalty.

Uncertainty Avoidance: The extent to which the members of the cultural programs cope with anxiety by minimizing uncertainty, either to feel comfortable or uncomfortable in unstructured situations. **Low uncertainty avoidance** is the willingness to take the risks and had more experimentation and innovative behavior.

Masculinity/Femininity: The distribution of values between the genders that is considers as fundamental issue in society.

Relationship Orientation: The extent to which the society focuses on the future as opposed to the past and present. **Long-term relationship** orientation promotes virtues and persistence and focus towards future rewards

2. After choosing the dimension(s), user need to fulfill **all the HCI icon principles** provided in the HCI Icon Principle Phase to design and create Culturicon.

Validation of Focus Group Question

Engagement questions:

1. Based on your experience in using the Culturicon, are you able to recognize what is the meaning of the Culturicon?
2. Are you familiar with the Culturicon?
3. Are you able to see and recognize the Culturicon at reading distance?
4. Are you able to clearly remember and identify the Culturicon after you used it for the first time?
5. Is the sorting of Culturicon clear?
6. Do you think that having Culturicon in mobile messaging application makes the technology feels closer and useful to you?
7. Do you think the design and color of the Culturicon is attractive enough that tempt you to use it?
8. Does the Culturicon design differ from each other?

Exploration Questions:

9. Does the Culturicon reflect the culture in Malaysia?
10. Do you think Culturicon is helpful for you to express the cultural element in mobile messaging application?
11. Do you think Culturicon is important in mobile messaging application to express Malaysia's culture?
12. Do you think that having Culturicon in mobile messaging application can help to attract more user to use technology especially the adults where the culture being represented digitally?
13. Do you think the Culturicon would assist user to have a better understanding on our culture, especially people from another culture?
14. Do you think the Culturicon would help someone to adapt to other culture?

Exit Questions:

15. What social impact does the Culturicon have in these group messages?

16. Should there be any additional cues on the Culturicon?

17. Is there any suggestion on how to express more about our culture in the form of emoticon?

Thank you for your cooperation.

Focus group questions in Bahasa Melayu

1. Berdasarkan pengalaman semasa menggunakan Culturicon, adakah anda dapat mengenalpasti apakah yang dimaksudkan dengan Culturicon tersebut?

2. Adakah anda merasa dekat dengan Culturicon tersebut?

3. Adakah anda dapat melihat dan mengenalpasti Culturicon pada jarak membaca?

4. Adakah anda dapat mengingati dengan jelas dan mengenalpasti Culturicon tersebut selepas anda menggunakannya untuk pertama kalinya?

5. Adakah susunan Culturicon jelas?

6. Dengan adanya Culturicon dalam aplikasi Telegram, adakah anda merasakan penggunaan teknologi semakin dekat dan berguna dengan anda?

7. Adakah anda merasakan reka bentuk dan warna-warni Culturicon mampu menarik perhatian anda untuk menggunakannya?

8. Adakah reka bentuk Culturicon berbeza antara satu sama lain?

9. Adakah Culturicon melambangkan budaya rakyat Malaysia?

10. Adakah Culturicon dapat membantu anda untuk menyatakan elemen budaya dalam aplikasi Telegram?

11. Adakah anda merasakan Culturicon penting dalam aplikasi Telegram untuk menjelaskan budaya Malaysia?

12. Adakah anda merasakan bahawa menggunakan Culturicon dalam aplikasi Telegram dapat membantu untuk menarik lebih ramai pengguna untuk menggunakan teknologi terutamanya golongan dewasa, di mana budaya diperlihatkan secara digital?

13. Adakah anda merasakan bahawa Culturicon mampu membantu penguna untuk mendapatkan gambaran yang lebih jelas terhadap budaya kita, terutamanya kepada masyarakat daripada budaya yang berbeza?

14. Adakah anda merasakan Culturicon dapat membantu seseorang untuk menyesuaikan diri dengan budaya lain?

15. Apakah impak sosial yang bakal dicetuskan oleh Culturicon terhadap pemesejan berkumpulan ini?

16. Perlukah Culturicon mempunyai isyarat tambahan?

17. Adakah terdapat cadangan bagaimana untuk menjelaskan lagi tentang budaya kita di dalam bentuk Culturicon?

Appendix M

Focus Group Finding

Fml-Familiar

Fml-Closer

Und-Meaning

1:17 ¶ 105, P2: Example of meaning in Teenagers

1:13 ¶ 101, P2: Agree for meaning 2 in Teenagers

P2 agree that Malaysian culture treat relationship according to status.

1:12 ¶ 99, P3: Example for Meaning in Teenagers

P3 understand the culturicon and agree with P2 about the meaning of the long-term relaitonship Culturicon.

1:11 ¶ 96, P2: Agree for Meaning in Teenagers

Participant explain his understanding on the long-term relationship Culturicon

1:9 ¶ 78, P7: Agree for Meaning in Teenagers

P7 stated that he is able to recognize the Culturicon.

Und-Meaning

1:7 ¶ 71, P5: Agree for Meaning in Teenagers

Agree with P5 that states they understand the meaning of Culturicon.

1:114 ¶ 62, P3: Example of not understand meaning in Teenagers

1:113 ¶ 58, P1: Example not understand meaning in Teenagers

1:2 ¶ 54, P3: Only some are confusing in Teenagers

P3 stated that only some are confusing, but the rest is clear.

1:6 ¶ 70, P6: Agree for Meaning in Teenagers

P6 inform that there are no confusing culturicon as they really not what its meaning.

1:3 ¶ 56, P1: Example Confuse Culturicon in Teenagers

P1 give example of istana anak bukit as confused culturicon as he cannotsee the details.

1:5 ¶ 69, P4: Agree for Meaning in Teenagers

1:1 ¶ 47, P1: Some are Confusing in Teenagers

P1 stated that some design are confusing because not detail.

supports

supports

supports

supports

associated with

associated with

supports

supports

expands

supports

associated with

Und-Understanding

Und-Adapt

Att-Design

Att-Attract
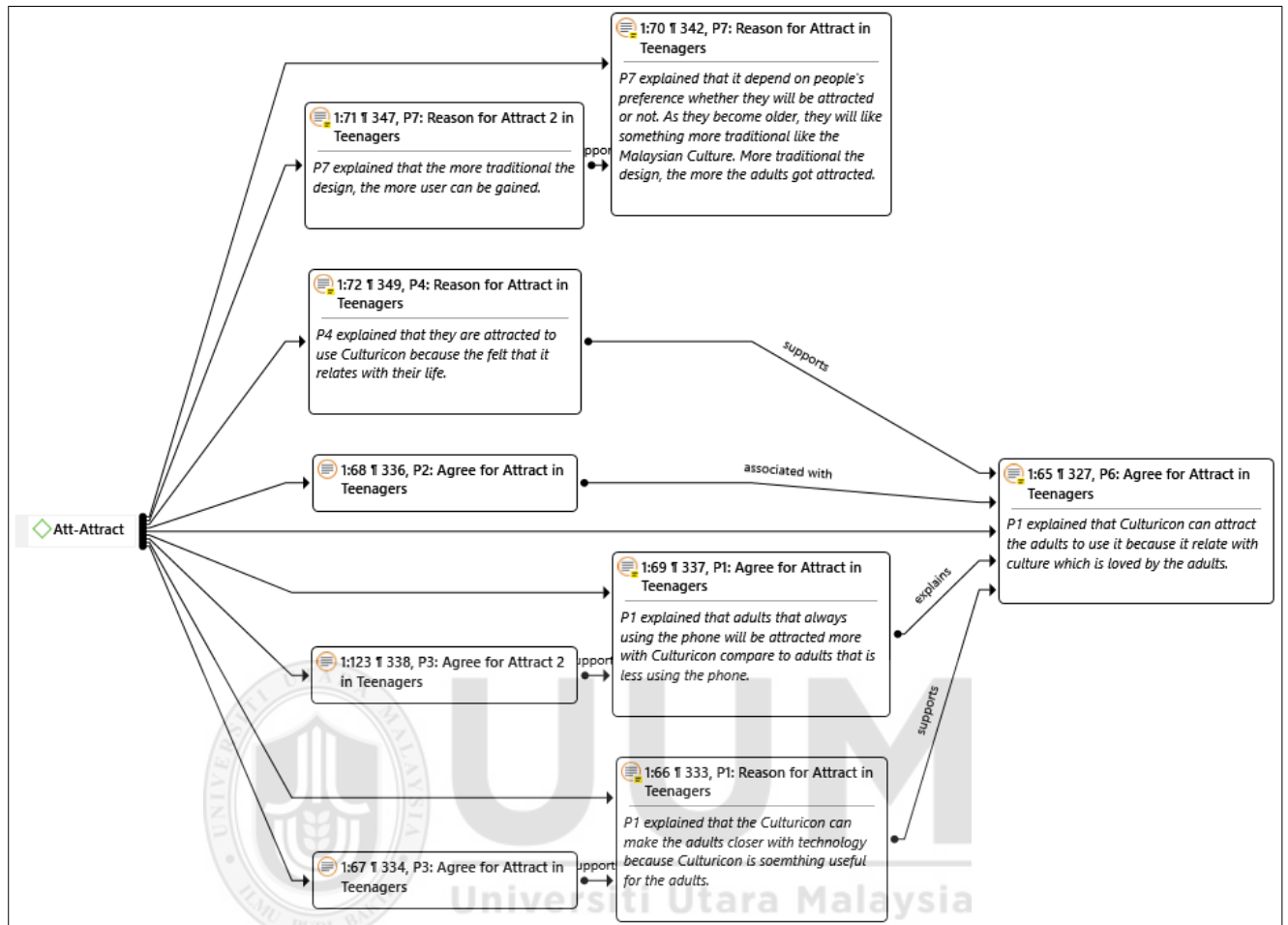
Inf-Reflect

Inf-Helpful

Inf-Important

Inf-Impact

1:92 ¶ 427, P7: Impact - Can fit in any conversation in Teenagers

P7 explained that the Culturicon is easy to be fit in any conversation.

1:90 ¶ 414, P4: Example of impact in Teenagers

P4 gaves example on how Culturicon is helpful such as to pray.

1:89 ¶ 411, P4: Impact-Make things easier in Teenagers

P4 explained that teh Culturicon make it easier for them for certain activities such as asking friend to go eating.

expands

1:91 ¶ 425, P2: Example of impact in Teenagers

P2 explained that the Culturicon make conversation becomes more fun and easier to be understood because it can show the activities and culture they want to do.

1:87 ¶ 403, P3: Example of impact in Teenagers

P3 explained that the Culturicon can help user to imagine the culture before they can see it in real life, especially for foreigner.

justifies

1:84 ¶ 397, P1: Impact-Imagine & fun in Teenagers

P1 explained that the Culturicon is relatable with their life that make it fun for them to be used.

1:86 ¶ 399, P5: Agree and reason for Impact in Teenagers

P5 stated that the Culturicon is relatable with their daily life that make it helpful and easy to be used.

expands

supports

supports

Inf-Impact

1:85 ¶ 398, P2: Agree for Impact in Teenagers

1:88 ¶ 405, P6: Add Knowledge and promote in Teenagers

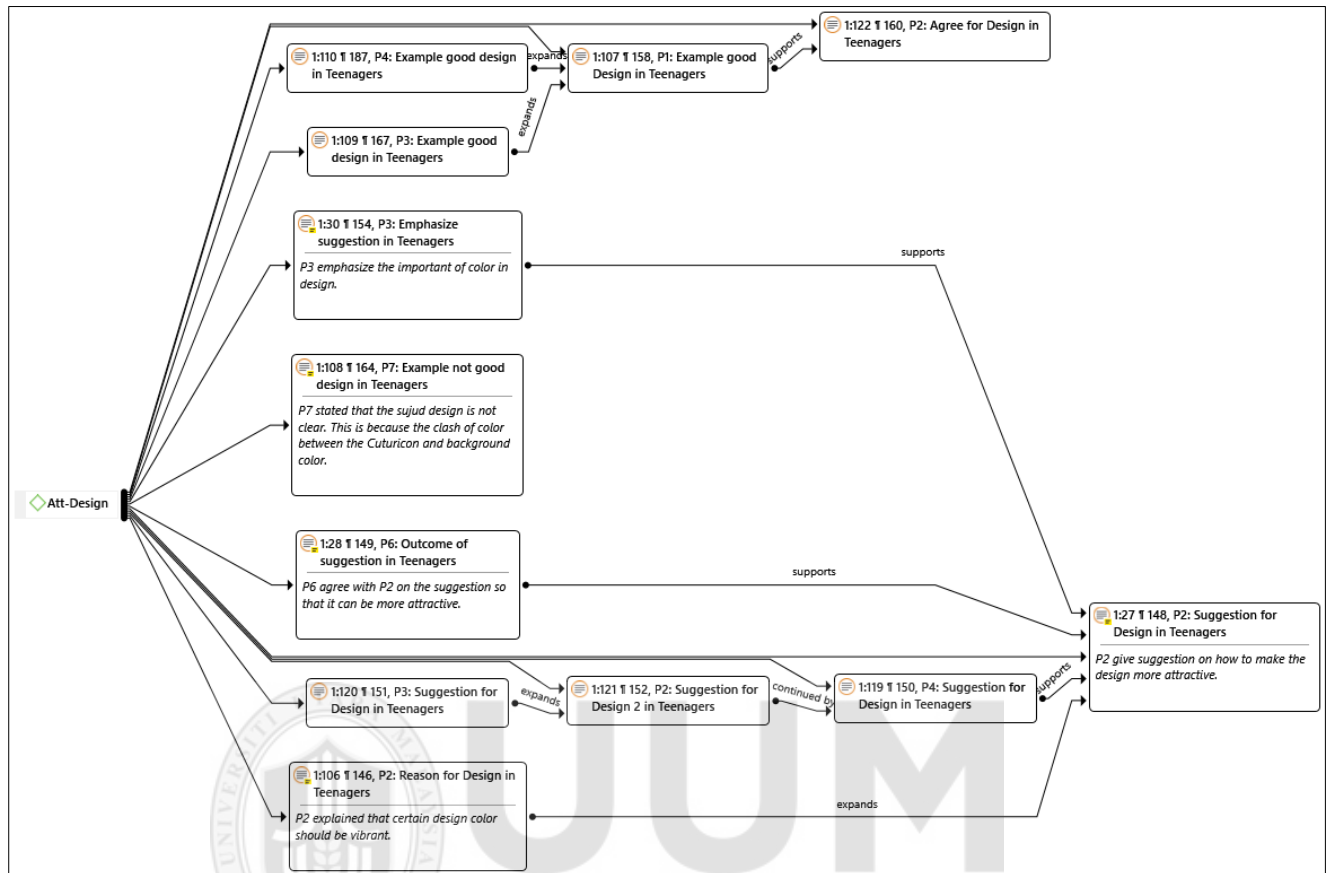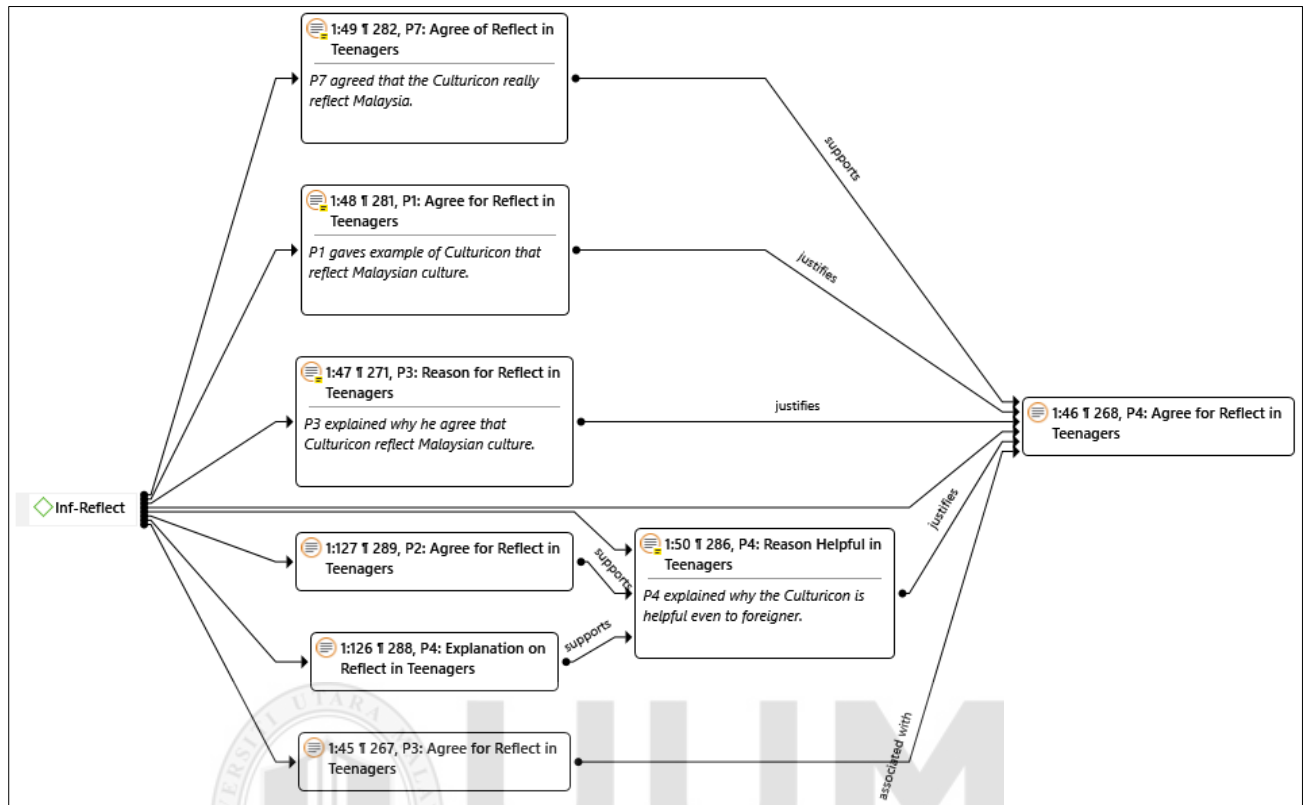*P6 explained that before the creation of Culturicon, he is not aware with Malaysian culture. When the Culturicon is created, he can acknowledge the Culture that he did not know before this and also feel encourage to promote it to others.*

1:83 ¶ 384, P2: Promote traditional games in Teenagers

P2 explained that Culturicon can help to promote Malaysian culture and preserve it from lost in our community.

supports

1:76 ¶ 361, P1: Impact on foreigner in Teenagers

P1 explained that once the foreigner understood the meaning of Culturicon, they can use it among their friends.

expands

1:51 ¶ 290, P1: Impact- Adults like to use in Teenagers

P1 stated that adults will like to use the Culturicon.

1:52 ¶ 293, P4: Impact on adult in Teenagers

P4 also agreed that the adults will like the Culturicon.

supports

384

Inf-Suggestion

Dis-Differ

The diagram shows "Dis-Differ" node connected to multiple elements:

- 1:42 ¶ 253, P1: Suggestion- Same design for 2 gender in Teenagers
  P1 suggest if the gender is different, it is okay if the design is same, but not to the same gender.

- 1:137 ¶ 254, P3: Remove same meaning design in Teenagers — justifies →

- 1:134 ¶ 238, P7: Agree for Differ in Teenagers — associated with →

- 1:132 ¶ 236, P4: Agree for Different design in Teenagers

- 1:133 ¶ 237, P2: Agree for Differ in Teenagers — associated with →

- 1:135 ¶ 241, P1: Example redundant design in Teenagers

- 1:138 ¶ 256, P5: Suggestion - Different action in prayer in Teenagers
  referring to prayer Culturicon

- 1:44 ¶ 263, P1: Suggestion - Add text in Teenagers
  P1 also suggest to put text on the Culturicon.

- 1:43 ¶ 262, P2: Suggestion - Add text in Teenagers
  P2 suggest to put text to differ the same design with different purpose.

- 1:41 ¶ 248, P3: Suggestion-Choose most attractive design in Teenagers
  P3 suggest to choose the most attractive only to avoid redundant.

- discusses → 1:40 ¶ 239, P1: Some are Differ, Some are not in Teenagers

Dis-Cue

387

Leg-Recognize